Final Draft Water Resource Management Plan 24

Annex 17: Strategic Environmental Assessment (SEA)

Environmental Report

May 2025
Version 5

from Southern Water

Contents

Glossary

Acronym	Term
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Areas
BNG	Biodiversity Net Gain
CAMS	Catchment Abstraction Management Strategy
CCRA	Climate Change Risk Assessment
CFMP	Catchment Flood Management Plans
CPRE	The Countryside Charity formerly known as the Council for the Protection of Rural England
CROW	Countryside and Rights of Way
CO_2	Carbon Dioxide
DLUHC	Department for Levelling Up, Communities and Housing, now Ministry of Housing, Communities and Local Government (MHCLG)
Defra	Department for Environment, Food and Rural Affairs
EAAP	Ecosystems Approach Action Plan
EU	European Union
FRA	Flood Risk Area
FZ	Flood Zone
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
HER	Historic Environment Record
HRA	Habitats Regulations Assessment
IMD	Index of Multiple Deprivation
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
km	Kilometres
$ktCO_2$	Kilo Tonnes of Carbon Dioxide
LNR	Local Nature Reserve
LSOA	Lower Super Output Area
LWS	Local Wildlife Sites
LULUCF	Land Use, Land-use Change, and Forestry

MCZ	Marine Conservation Zone
MPA	Marine Protected Area
NCA	National Character Area
NERC	Natural Environment and Rural Communities
NNR	National Nature Reserve
NO_2	Nitrogen Dioxide
NPPF	National Planning Policy Framework
ONS	Office for National Statistics
PM	Particulate Matter
RAG	Red-Amber-Green
RCP	Representative Concentration Pathway
RBMP	River Basin Management Plan
SAC	Special Areas of Conservation
SEA	Strategic Environmental Assessment
SES Water	Sutton & East Surrey Water
SMP	Shoreline Management Plans
SM	Scheduled Monument
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
SRO	Strategic Resource Option
SPA	Special Protection Area
HRA ToLS	Habitats Regulations Assessment Test of Likely Significance
UK	United Kingdom
UKCP18	UK Climate Projections 2018
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WFD	Water Framework Directive
WHS	World Heritage Site
WRMP	Water Resource Management Plan. The Water Resource Management Plan for the period beginning 2024 is abbreviated to WRMP24. The Draft WRMP24 abbreviated to dWRMP24, the Revised Draft WRMP24 to rdWRMP24 and the Final Draft WRMP24 to fdWRMP24
WRZ	Water Resource Zone
WRSE	Water Resources South East

Non-technical summary

Overview

This Non-Technical Summary (NTS) provides an overview of the Environmental Report produced as part of the Strategic Environmental Assessment (SEA) of Southern Water's Final Draft Water Resource Management Plan 2024 (fdWRMP24). The Environmental Report represents the fourth formal output of the SEA of the WRMP24, following the scoping technical note which was issued to SEA consultation bodies in February 2022, the Environmental Report that accompanied the Draft WRMP24 (dWRMP24) issued for consultation between November 2022 and February 2023 and the revised Environmental Report that accompanied the Revised Draft WRMP24 (rdWRMP24) on submission to regulators in September 2023 and consultation in 2024. The SEA is being carried out to identify, describe and evaluate the likely significant environmental effects of the fdWRMP24 and to identify ways in which adverse effects can be avoided, minimised or mitigated and how any positive effects can be enhanced.

The Environmental Report presents the findings of the SEA and is being issued for consultation alongside the fdWRMP24. The following sections of this NTS:

- provide an overview of the fdWRMP24;
- describe the SEA process together with how it is to be applied to the fdWRMP24 taking into account the Regional Plan;
- present the relevant contextual information and outline the approach to completing the assessment of the fdWRMP24;
- summarise the findings of the SEA of the fdWRMP24, including cumulative effects and mitigation measures;
- outline the proposed monitoring measures; and
- set out the next steps in the SEA of the WRMP24.

Water Resource Management Plans

Each water company's WRMP sets out how the balance between water supply and demand, and security of supply, will be maintained over a minimum of 25 years in a way that is economically, socially and environmentally sustainable. This will include public water supply (PWS) and non-public water supply (non-PWS). The over-arching 'best value' planning objectives to meet statutory and policy requirements are:

- Deliver a secure and wholesome supply of water;
- Deliver environmental and social benefit;
- Increase the resilience of water systems;
- Deliver at a cost that is acceptable to customers.

Table NTS1 sets out these objectives and the associated criteria and metrics for the delivery of the WRMP[1].

[1] Final Draft Water Resources Management Plan 2024: Technical Report, May 2025

Table NTS1: WRMP objectives, criteria and metrics.

Best value objective	Criteria	Metric
Deliver a secure and wholesome supply of water to customers and other sectors to 2100	Meet the supply demand balance	Public water supply - supply demand balance profile (Ml/d) Provides additional water needed by other sectors (Ml/d)
	Leakage	50% reduction in leakage by each company by 2050 from 2017-18 baseline (%) % leakage reduction above 50%
	Water into supply	Distribution input (DI) per property (litres per day)
	Customer preference	Customer preference for option type (score)
Deliver environmental improvement and social benefit	Strategic Environmental Assessment (SEA)	Programme benefit (score max) Programme disbenefit (score min)
	Natural capital	Enhancement of natural capital value (£m)
	Abstraction reduction	Reduction in the volume of water abstracted at identified sites (Ml/d) and by when (date)
	Biodiversity	Net gain score (%)
	Carbon	Cost of carbon offsetting (£m)
Increase the resilience of the region's water systems	Drought resilience	Achieve 1-in-500 drought resilience (date achieved)
	Resilience assessment reliability	Programme reliability score
	Resilience assessment adaptability	Programme adaptability score
	Resilience assessment evolvability	Programme evolvability score
Deliverable at a cost that is acceptable to customer	Programme cost	Net present value (£m) using the social time preference rate (STPR)
	Inter-generational equity	Net present value (£m) using the long-term discount rate (LTDR)

National guidance[2] requires alignment of water company WRMPs with the regional plan. In consequence, Southern Water has worked with Water Resources South East (WRSE), a collaboration of the six[3] water companies that supply water in south east England, to develop and apply a consistent framework for water resource plan development, with work split between the regional and company level. This included the following stages:

1. Prepare supply-demand balance information.
2. Develop a list of options that considers government policy and aspirations.
3. Undertake problem characterisation and evaluate strategic needs and complexity.
4. Decide on a modelling method.
5. Identify and define data inputs to model(s).
6. Undertake decision-making (options appraisal) modelling.

[2] UK Government (2023) *Water Resource Planning Guideline* [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline.

[3] Affinity Water, Portsmouth Water, SES Water, South East Water, Southern Water and Thames Water

7. Carry out sensitivity tests.
8. Produce a final planning forecast.

Steps 1-3 have primarily been undertaken by member water companies individually. WRSE has progressed steps 4-8 after agreeing on an approach with members and consulting on the overall method with other stakeholders.

In line with the steps identified, Southern Water has developed a supply-demand balance to identify those Water Resource Zones[4] (WRZs) in deficit over the lifetime of the plan (and so where additional water resources are required). The WRMP presents options for the resolution of the WRZ deficit. Option selection for the fdWRMP24 entails the following steps:

- Identification of an **unconstrained list** of options.
- Screening and filtering of the list against initial screening criteria to develop a **feasible list**. Options that are impractical or have unacceptable environmental or economic impacts are removed.
- Screening against final screening criteria to arrive at a **constrained list**. Constrained options are taken forward into the decision-making modelling process.
- **Environmental assessment** of the options as part of the Strategic Environmental Assessment (SEA), Habitats Regulations Assessment (HRA), Water Framework Directive (WFD), Biodiversity Net Gain (BNG) and Natural Capital assessment processes. The findings of which are also taken forward into the decision-making modelling process.

All of the options on the constrained options list are considered to be viable and potentially deliverable and are, therefore, made available for selection in the investment modelling process. The options selected by the investment model, under various planning scenarios in each WRZ, form the list of 'preferred options' in the fdWRMP24.

Types of water resource management options considered to meet any forecast deficit in a WRZ can include:

- **Customer options** which include measures to manage the demand for water such as smart meters, rainwater harvesting, greywater recycling or household visits to install water efficient devices.
- **Distribution options** which include measures to optimise the efficiency of water networks, reduce leakage and minimise any unscheduled resource losses.
- **Production options** include measures to increase the efficiency and effectiveness of treatment processes.
- **Resource management options** which include measures to increase supply such as greater peak output at existing groundwater sources, reservoir or surface water supply and which will include SROs; this also includes catchment management options, for example nature-based solutions.
- **Non-PWS options** which include any options which increase water resource availability or reduce the need for abstraction outside of that needed for public water supplies.

The preferred plan options collectively comprise the proposed plan programme. In developing the preferred programme, consideration is given to alternative plan programmes (or pathways) developed in response to different scenarios, to resolve any supply deficits in relation to financial, environmental and social costing and, potentially, to facilitate water trading between companies.

[4] UK Government (2023) *Water Resource Planning Guideline [online*]. Available at: https://www.gov.uk/government/publications/waterresources-planning-guideline/water-resources-planning-guideline

Section 4.4. of the WRPG defines a water resource zone as "an area within which the sources of water and distribution of water to meet demand, is largely self-contained (apart from any agreed bulk transfers)".

Southern Water provides water supplies to just over 2.6 million customers across an area of 4,450km^2, extending from East Kent, through parts of Sussex, to Hampshire and the Isle of Wight in the west. The Southern Water region is divided into fourteen WRZs which are geographically separate and amalgamated into three larger, sub-regional areas (see **Figure NTS1**).

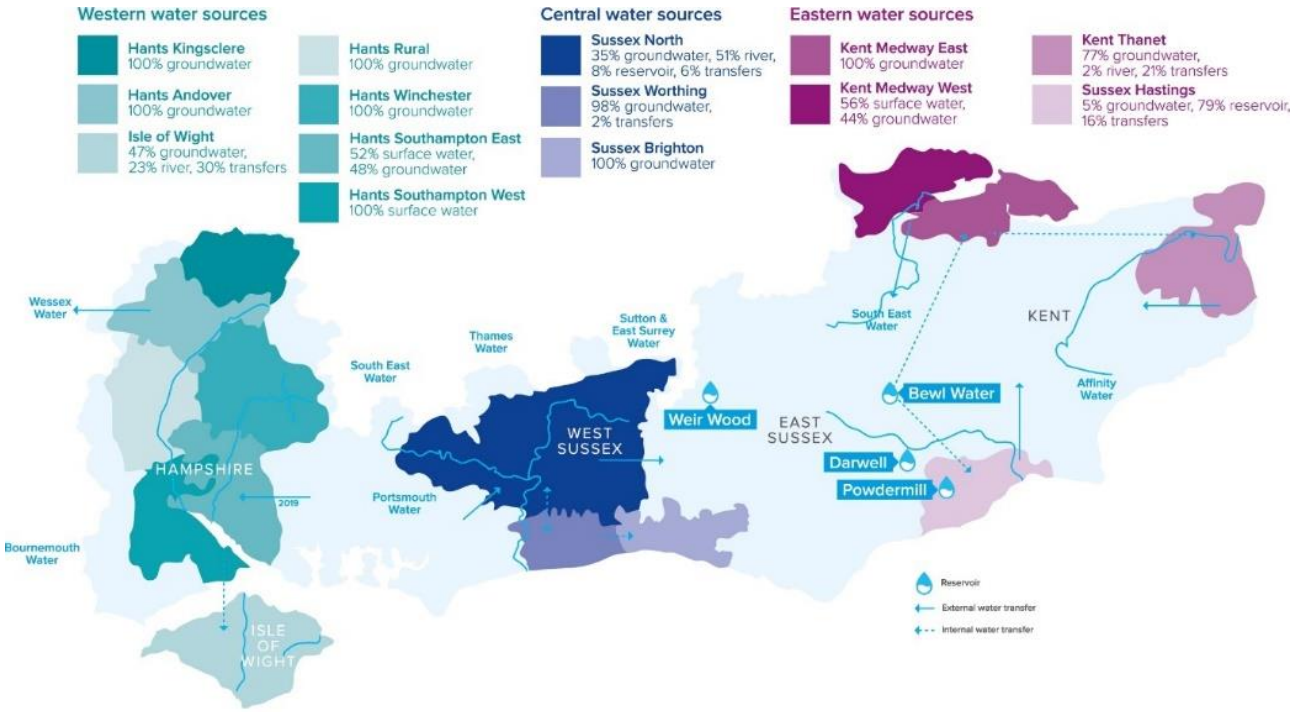

Figure NTS1: Southern Water's supply area

Southern Water face challenges in its Western and Central areas, as a result of already implemented licence changes, and proposed further abstraction reductions to protect and enhance the environment. There are now limited opportunities to develop new 'conventional' sources of water such as abstraction from rivers or groundwater. Consequently, in order to ensure uninterrupted supplies in all but the most extreme weather conditions (i.e. a drought of greater than 1:500 severity), Southern Water's fdWRMP24 includes ambitious demand management targets to reduce both leakage and consumption in addition to building 'non-conventional' sources of water such as water recycling and desalination.

At a **company level**, Southern Water aims to:

- reduce consumption by household customers in order to reduce average per capita consumption (pcc) to 110 litres per head per day by 2044-45 under dry year conditions. This is 5 years earlier than the 2049-50 target year set by the Government;
- reduce leakage by 53% by 2049-50 compared to the reported leakage in 2017-18. The is higher than the 50% reduction required by the Government;
- reduce non-household consumption by 9% compared to the reported figure in 2019-20 by 2037-38;
- promote catchment and nature-based solutions through the Catchment First programme to improve environmental resilience;
- stop the use of all supply-side drought permits and orders by 2040-41 at the latest, unless faced with a drought of more than 1-in-500 year severity.

The **Western area** strategy involves:

- continuation of all existing internal transfers as well as external bulk imports and exports;

- implementing water efficiency programmes to reduce household and non-household consumption from 2025-26 to reduce consumption by 39.2 million litres per day (Ml/d) by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- implementing leakage reduction measures from 2025-26 to reduce leakage by 9.9Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- removing constraints at Newbury groundwater source to increase yield (1.2Ml/d) from 2027-28;
- drilling new boreholes at Romsey to provide 4.8Ml/d from 2030-31;
- removing constraints and Kings Sombourne groundwater source to provide up to an additional 2.5Ml/d from 2030-31;
- increasing transfer capacity between Hampshire Rural and Hampshire Southampton West water resource zones through the Romsey Town and Broadlands valve to transfer an additional 5Ml/d from 2030-31;
- delivering Sandown Wastewater Treatment Works recycling scheme to provide up to 8.5Ml/d from 2030-31;
- constructing the 'Hampshire grid' to move water more easily in the Hampshire area from 2030-31;
- bulk import (up to 21Ml/d) from Portsmouth Water to Itchen Water Supply Works from 2031-32 following the construction of Havant Thicket Reservoir;
- bulk import (up to 90Ml/d) from Havant Thicket Reservoir to Itchen Water Supply Works from 2034-35 following the delivery of Hampshire Water Transfer and Water Recycling Project;
- implementing Test Managed Aquifer Recharge scheme to provide up to 5.5Ml/d from 2035-36;
- drilling new boreholes at Newchurch groundwater source to increase yield by 1.9Ml/d from 2036-37;
- drilling new boreholes at Eastern Yar3 groundwater source to increase yield by 1.5Ml/d from 2039-40;
- bulk import (up to 120Ml/d) into Hampshire through Thames to Southern Transfer from 2039-40;
- terminating the use of Lower Itchen Drought Permit/Order after 2029 -30;
- terminating the use of Candover Drought Order after 2033-34;
- terminating the use of River Test Drought Permit/Order after 2033-34 under droughts of up to 1-in-200 year severity;
- terminating the use of all supply-side drought permits/orders after 2040-41 unless faced with a drought of more than 1-in-500 year severity;
- continuing to use Temporary Use Bans and Non-Essential Use Bans to manage demand during droughts.

The **Central area** strategy includes:

- continuation of all existing internal transfers as well as external bulk imports and exports;
- implementing water efficiency programme to reduce household and non-household consumption from 2025-26 by 35.8Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- implementing leakage reduction measures from 2025-26 to reduce leakage by 7.6Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- bulk import from SES Water (up to 4Ml/d) from 2025-26 to 2030-31;
- reinstating West Chiltington groundwater source to provide up to 3.1Ml/d from 2028-29;
- refurbishing Petersfield groundwater source to provide up to 1.6Ml/d from 2028-29;
- terminating the use of Pulborough surface water drought permit/order after 2029-30 under droughts of up to 1-in-200 year drought severity;
- delivering a new treatment works at Weir Wood Reservoir with a 21Ml/d capacity from 2030-31
- drilling new boreholes at Petworth to provide up to 4Ml/d from 2030-31;
- asset enhancement at Lewes Road groundwater source to provide up to 3.5Ml/d from 2030-31;
- recycled water from Littlehampton Wastewater Treatment Works (up to 15Ml/d) from 2030-31;

- bulk import from SES Water of up to 10Ml/d from 2033-34;
- bulk import (up 10Ml/d) from South East Water to Pulborough from 2039-40;
- bulk import (up to 50Ml/d) from Havant Thicket Reservoir to Pulborough from 2039-40;
- building pipeline to transfer up to 35Ml/d between Pulborough and Worthing from 2039-40;
- improving treatment capacity at Pulborough to provide up to 2Ml/d from 2040-41;
- building pipeline to transfer up to 4Ml/d between Worthing and Brighton from 2040-41;
- building a desalination plant close to the River Arun to provide benefit from 2040-41 to deliver up to 40Ml/d by 2049-50;
- construction of River Adur Offline Reservoir to provide up to 19.5Ml/d from 2045-46;
- use of recycled water from Horsham Wastewater Treatment Works with storage at Pulborough to provide up to 11.5Ml/d from 2057-58;
- bulk import (up to 20Ml/d) from South East Water to Brighton from 2065-66;
- terminating the use of all supply-side drought permits/orders after 2040-41 unless faced with a drought of more than 1-in-500 year severity;
- continuing to use Temporary Use Bans and Non-Essential Use Bans to manage demand during droughts.

The **Eastern area** strategy involves:

- continuation of all existing internal transfers as well as external bulk imports and exports;
- implementing water efficiency programme to reduce household and non-household consumption from 2025-26 to reduce demand by 37.4Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- implementing leakage reduction measures from 2025-26 to reduce leakage by 10.9Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- recycling from Medway Wastewater Treatment Works for up to 14Ml/d from 2030-31;
- recycling from an industrial source in Sittingbourne (7.5M/d) from 2030-31;
- recommissioning Gravesend groundwater source (2.7Ml/d) from 2030-31;
- conjunctive use of Bewl Water with recycled water from Tonbridge Wastewater Treatment Works to provide up to 5.7Ml/d from 2035-36;
- reconfiguring Rye Wells to provide up to 1.5Ml/d benefit from 2039-40;
- developing a desalination plant on the Thames Estuary from 2039-40 to provide up to 40Ml/d;
- developing a desalination plant on the Isle of Sheppey to provide up to 20Ml/d from 2040-41, increasing to 30Ml/d by 2062-63;
- developing a desalination plant in East Thanet to provide 20Ml/d from 2040-41, increasing to 40Ml/d by 2049-50;
- bulk import (up to 20Ml/d) from South East Water to near Canterbury from 2049-50;
- bulk import (up to 10Ml/d) from South East Water to Rye from 2049-50;
- conjunctive use of Darwell Reservoir with recycled water from Hastings Wastewater Treatment Works (up to 6.8Ml/d) from 2050-51;
- raising Bewl Water by 0.4m for up to 3Ml/d benefit from 2060-61;
- terminating the use of all supply-side drought permits/orders after 2040-41 unless faced with a drought of more than 1-in-500 year severity;
- continuing to use Temporary Use Bans and Non-Essential Use Bans to manage demand drought droughts.

Strategic Environmental Assessment

SEA is required under Statutory Instrument 2004 No.1633 - The Environmental Assessment of Plans and Programmes Regulations 2004. Throughout the course of the development of the plan, policy or programme,

the aim of SEA is to identify the potential impact of options proposed in the plan in terms of their environmental, economic and social effects. If any adverse effects are identified, these options can then be avoided, or proposals modified to manage or mitigate adverse effects.

In this context, the purpose of the SEA of the fdWRMP24 is to:

- identify the potentially significant environmental effects of the plan in terms of the water resource management options being considered;
- help identify appropriate measures to avoid, reduce or manage adverse effects and to enhance beneficial effects associated with the implementation of the plan wherever possible;
- give the statutory SEA bodies, stakeholders and the wider public the ability to see and comment upon the effects that the plan may have on them, and encourage them to make responses and suggest improvements to the plan; and
- inform the selection of water resource management options to be taken forward into the final versions of the plan.

SEA comprises five key stages:

- **Stage A:** Scoping.
- **Stage B:** Develop and refine alternatives and assess effects.
- **Stage C:** Prepare Environmental Report.
- **Stage D:** Consult on the plan and Environmental Report and prepare the post adoption SEA statement.
- **Stage E:** Monitor environmental effects.

Stage A of the SEA of the WRMP24 has been summarised in the scoping technical note. The scoping stage itself is comprised of five tasks that are listed below:

i. Review of other relevant policies, plans, programmes and strategies (hereafter referred to as ‘plans and programmes’).

ii. Collation and analysis of baseline information.

iii. Identification of key sustainability issues.

iv. Development of the assessment framework.

v. Consultation on the scope of the SEA (this Scoping Report).

The scoping technical note sets out the approach to assessing the likely significant environmental effects of the WRMP24 (and its iterations). It was issued for scoping consultation for 5 weeks from 21st February to 27th March 2022. Following scoping consultation and amendment as appropriate, the framework has been used to assess the likely significant environmental effects (including cumulative effects) of the water resource options contained in the dWRMp24, the rdWRMP24 and the dfWRMP24 and any reasonable alternatives (**Stage B**). For the purposes of this SEA, the constrained options have been considered as reasonable alternatives to the preferred options (that comprise the Preferred Plan).

These assessments are presented in an Environmental Report (in a form to meet the requirements of Schedule 2 of the SEA Regulations) which has been completed to accompany each consultation version of the WRMP24 (the dWRMP24, the rdWRMP24 and the fdWRMP24) (**Stage C**).

The dWRMP24 and accompanying documents including the Environmental Report were submitted to Defra (formerly the Secretary of State for Environment, Food and Rural Affairs) for a request for publication. Following direction, Southern Water published the documents for consultation from November 2022 and February 2023 (**Stage D**).

Following consultation, Southern Water prepared a Statement of Response to the representations received. It then completed further work reflecting revisions to the drought resilience and demand management expectations which led to amendments to the dWRMP24 and a rdWRMP24 was completed and given the changes, was also subject to further environmental assessment. The findings were presented in an accompanying Environmental Report and submitted to regulators in September 2023. The rdWRMP24 and accompanying documents including the Environmental Report were then submitted to Defra, for a request for publication. Following direction, Southern Water published the documents for consultation from 11th September to 4th December 2024.

Further changes to the rdWRMP24 were then made following further engagement with regulators and modelling carried out by WRSE. The fdWRMP24 and accompanying documents including the revised Environmental Report will be submitted to Defra, for a request for publication and once directed to do so, Southern Water will publish the documents for consultation.

Taking into account the consultation responses received and any further work undertaken, a final WRMP24 will be sent to the Government, and if changes are likely to be significant, is likely to be subject to further assessment. The final WRMP24 will be sent to the Government, and following direction, the final WRMP24 will be published and implemented accordingly. In conjunction with publishing the final WRMP24, a post adoption statement will also be issued to meet the requirements of SEA regulation 16 (4). This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final plan.

The SEA requires monitoring of any resulting environmental effects of the WRMP24 (**Stage E**).

The WRSE Regional Plan Environmental Assessment

Southern Water is developing its WRMP24 as part of the WRSE Regional Plan[5,6]. The Regional Plan looks beyond the boundaries of individual companies and identifies options that will deliver the most benefit across the region.

The interactions and the need for consistency between the Regional Plan and the WRMPs, and between regions has driven development of new approaches and methodologies in the preparation of WRMP24s. In this regard, WRSE commissioned the development of a new integrated environmental appraisal process to provide a consistent framework for environmental assessments for WRMP24. The method[7] has been developed taking into account the guidance from the Environment Agency and uses an integrated approach covering SEA, HRA, WFD, Natural Capital Assessment (NCA) and Biodiversity Net Gain (BNG). A separate SEA Scoping Report[8] was published in September 2020. It was subject to consultation in 2020 and has been revised[9].

The revised environmental assessment methodology provides the approach to assessment for water companies when undertaking their WRMP24 regulatory environmental assessments. Consequently, some of the supporting information required for Southern Water's dWRMP24, rdWRMP24 and fdWRMP24 SEA has

[5] WRSE (2022) Futureproofing our water supplies: A Consultation On Our Draft Regional Plan For South East England, November 2022. Available at: https://www.wrse.org.uk/media/va1bz21z/10306a_wrse-bv-plan-2022final_online.pdf

[6] WRSE (2023) Futureproofing our water supplies: Summary Of Our Revised Draft Plan For South East England https://www.wrse.org.uk/media/u0knltxt/wrse-regional-plan-summary-august-2023_final.pdf

[7] WRSE (2020) *WRSE Method Statement: Environmental Assessment* Consultation version July 2020. Available at: https://www.wrse.org.uk/media/wjig1mdu/wrse_file_1329_wrse-ms-environmental-assessment.pdf

[8] WRSE (2020) *WRSE Regional Plan Strategic Environmental Assessment Scoping Report*. Available at https://www.wrse.org.uk/media/51vdwyw0/wrse-regional-plan-strategic-environmental-assessment-scoping-report.pdf

[9] WRSE (2021*), Method Statement: Environmental Assessment Post-consultation version*, November 2021. Available at: https://www.wrse.org.uk/media/qmtb1e5v/method-statement-environmental-assessment-nov-2021.pdf

been produced as part of the regional plan environmental assessments. The following summarises how, whilst aligned with the WRSE approach, Southern Water has supplemented it (and the information provided), consistent with regulator feedback when completing the assessments of the draft and fdWRMP24:

- Used the WRSE Regional Plan SEA Scoping Report[10] and consultation responses received as the basis of the proposed approach to assessment (including the relevant contextual information, the 14 assessment objectives and the assessment scoring criteria). Consistent with paragraph 1.36 of the WRSE Method Statement, where relevant, the contextual information (including the review of plans and programmes and baseline information) has been revised to supplement the information already collated and presented.
- Revised the approach to assessment of the (revised) preferred options, reflecting comments received on the dWRMP24 Environmental Report to ensure the consistent treatment of designated conservation, heritage and landscape sites and features within the assessment. This includes Sites of Specific Scientific Interest (SSSIs), SSSI risk zones, Marine Conservation Zones (MCZs), National Nature Reserves (NNRs), Ancient Woodland, World Heritage Sites, National Parks and National Landscapes[11], and supplements the range of features already considered when identifying, describing and evaluating the likely significant effects of individual options. These changes are summarised in Section **Error! Reference source not found.** of the main Environmental Report.
- Used the revised SEA assessment methodology to complete:
  - an assessment of the likely significant effects of the revised preferred options for each of Southern Water WRZs in deficit;
  - an assessment of the effects of the revised preferred programme of options and any identified alternative plans;
  - an assessment of the cumulative effects of the rdWRMP24 and fdWRMP24 (by WRZ) and with other infrastructure proposals or plans will be considered and assessed including, in particular, other water company WRMPs, the Regional Plan and SROs.

Key environmental issues for the WRMP24

The key environmental issues relevant to the assessment of the WRMP24 (and its iterations) have been identified from a variety of sources, including a review of baseline data, other relevant plans and programmes and the WRSE work. A summary of the issues identified as being most relevant to the assessment of the WRMP24 are shown in **Table NTS2**.

[10] https://www.wrse.org.uk/media/51vdwyw0/wrse-regional-plan-strategic-environmental-assessment-scoping-report.pdf

[11] The term 'National Landscapes' reflects the Government's response to the recommendations of the 2019 Landscapes Review (as a replacement of Area of Outstanding Natural Beauty (AONB)); however, whilst the term National Landscape is used, given the legal designation remains 'Area of Outstanding Natural Beauty' (AONB) (under the 1949 National Parks and Access to Countryside Act) reference to AONB has also been retained in this report.

Table NTS2: Key environmental issues.

SEA topic	Summary
Biodiversity, flora and fauna	The key sustainability issues arising from the baseline assessment for biodiversity are: • The need to protect or enhance and support the achievement of favourable condition and conservation status WRMP24 area's biodiversity, particularly within designated sites, species and habitats of principal importance, informed by the evidence base. • The need to consider the implications of effluent re-treatment options on existing discharges from wastewater treatment works and the consequences for nutrients within receiving waters. • The need to avoid activities likely to cause irreversible damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors and habitat patches or stepping stones. • The need to take opportunities to deliver biodiversity net gains. • The need to control the spread of Invasive Non-Native Species (INNS). • The need to recognise the importance of building wildlife's resilience to, and allowing wildlife to adapt to climate change. • The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.
Water	The key issues arising from the baseline assessment for water are: • The need to further improve the quality of the regions river, estuarine, wetlands and coastal waters taking into account WFD objectives. • The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives. • The need to improve the resilience, flexibility and sustainability of water resources in the WRMP24 area, particularly in light of potential climate change impacts on surface water and groundwaters. • The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply. • The need to ensure that people understand the value of water.
Soil	The key sustainability issues arising from the baseline assessment for soil, geology and land use are: • The need to protect and enhance geological features of importance (including geological SSSIs). • The need to maintain and enhance soil function and health, including its role as a carbon sink. • The need to manage the land and soil more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources and best and most versatile soils).
Air	The key sustainability issues arising from the baseline assessment for air are: • The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.
Climatic factors	The key sustainability issues arising from the baseline assessment for climatic factors are: • The need to reduce greenhouse gas emissions (industrial processes and transport). • The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities afforded by climate change.

SEA topic	Summary
Population, communities and human health	The key sustainability issues arising from the baseline assessment for population and human health are: • The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water for health and wellbeing. • The need to ensure water supplies contribute to improvements in levels of health, particularly in urban areas and deprived areas. • The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other use such as agriculture. • The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment. • The need to accommodate an increasing population and housing growth through provision of essential services including water supply. • Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and wellbeing and the economy. • The need to reduce the risk of harm from environmental hazards, such as flooding and drought.
Historic environment	The key sustainability issues arising from the baseline assessment for archaeology and cultural heritage are: • The need to conserve or enhance sites of archaeological importance and cultural heritage interest, particularly those which are sensitive to the water environment. • The need to protect water-dependent heritage sites during drought and flood conditions.
Landscape	The key sustainability issues arising from the baseline assessment for landscape and visual amenity are: • The need to protect and improve the natural beauty of the area's National Landscapes, National Parks and other areas of natural beauty. • The need to protect and improve the character of landscapes and townscapes.
Material assets	The key sustainability issues arising from the baseline assessment for material assets and resource use are: • The need to minimise the consumption of resources, including water and energy. • The need to reduce the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill. • The need to continue to reduce leakage from the water supply system to help reduce demand for water. • Daily consumption of water is relatively high and consequently there is a continued need to encourage more efficient water use by consumers.

Section 2 of this report summarises the review of plans and programmes relevant to the fdWRMP24 and SEA that is contained in Appendix F Review of Plans, Policies and Programmes**.**

Section 3 presents the baseline analysis of characteristics, along with how these are likely to change in the future.

Assessing the effects of the fdWRMP24

The revised assessment framework has been used to assess the environmental effects of the fdWRMP24. The assessment framework sets out 14 assessment objectives relating to the key issues identified in **Table NTS2**. For each objective, guide questions are provided.

The performance of the constrained, preferred options/preferred programme within the fdWRMP24 and any reasonable alternatives have been assessed against these objectives to ensure that each option is assessed in a robust and consistent manner. The assessment framework is shown in **Table NTS3**.

Table NTS3: SEA topics and assessment objectives.

SEA topic	SEA objective
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)
Soil	Protect and enhance the functionality, quantity and quality of soils
Water	Increase resilience and reduce flood risk
	Protect and enhance the quality of the water environment and water resources
	Deliver reliable and resilient water supplies
Air	Reduce and minimise air emissions
Climatic factors	Reduce embodied and operational carbon emissions
	Reduce vulnerability to climate change risks and hazards
Landscape	Conserve, protect and enhance landscape, townscape and seascape character and visual amenity
Historic environment	Conserve, protect and enhance the historic environment, including archaeological remains
Population and human health	Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing
	Maintain and enhance tourism and recreation
Material assets	Minimise resource use and waste production
	Avoid negative effects on built assets and infrastructure

The fdWRMP24 constrained and preferred options have been assessed based on the nature of the effect, its timing and geographic scale, the sensitivity of the human or environmental receptor that could be affected, and how long any effect might last. Specific guidance has been developed for what constitutes either a neutral, minor, moderate or major positive or negative effect for each of the SEA objectives. These 'definitions of significance' have helped to ensure a consistent approach to interpreting the significance of effects and will help the reader understand the decisions made by the assessor. Assessment matrices have been used to capture the assessment of each measure in a consistent manner.

The assessment is based on the most recent option information confirmed with Southern Water to ensure the timely completion of the necessary individual option assessments to include in this report to accompany the submission of the fdWRMP24.

Section 4 of the Environmental Report provides further information in relation to the approach to the assessment of the fdWRMP24.

Principal outcomes of the assessment

Sections 5 and 6 of this report provide further information in relation to the assessment of the fdWRMP24.

The assessment of each of the constrained options is presented in Appendix I Constrained Options Assessments.

Following option appraisal and screening, 60 preferred supply options[12], 6 supply side drought options, 40 demand management drought options (consisting of three option types applied across the WRZs), 12 generic demand management options[13] and 5 generic leakage options[14] have been identified to support the delivery of the fdWRMP24. The assessment of each of the preferred options is presented in **Appendix K** Revised Preferred Options Assessments.

Table NTS4 summarises the likely significant effects (positive and negative) for each SEA topic identified in respect of various preferred supply options, presented by WRZ, water transfer schemes and catchment management. These are post-mitigation effects and, if the options are taken forward, would require further refinement including further investigation and the application of additional mitigation measures with the aim of reducing the significant negative effects and enhancing those positive ones. However, some may not be able to be further mitigated.

Tables NTS4 summarises, by SEA Topic, the likely significant effects identified for the preferred supply options by WRZ.

Table NTS4: Significant effects identified by SEA topic and objective (post mitigation).

SEA topic	SEA objective	Significant effects identified
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	Significant negative effects with uncertainty have been identified for the biodiversity SEA objective for options located in the Isle of Wight, Hampshire Southampton East, Kent Medway East, Kent Medway West, and Kent Thanet WRZs. All of the following options were identified as having significant negative effects with uncertainty in the operation phase, whilst for option Desalination (KTZ): East Thanet (20Ml/d), this was also identified as having a significant negative uncertain effect during the construction phase: • Drought option - supply side (IOW): Caul Bourne (1.5Ml/d) • Drought option - supply side (HSE): Candover (22Ml/d); • Drought option - supply side (HSE): Lower Itchen; • Desalination (KME): Isle of Sheppey (10Ml/d) phase 2; • Desalination (KME): Isle of Sheppey 20Ml/d; • Desalination (KMW): Thames Estuary (10Ml/d); • Desalination (KMW): Thames Estuary (10Ml/d) Phase 2; • Desalination (KMW): Thames Estuary (20Ml/d); • Desalination (KMW): Thames Estuary (20Ml/d) Phase 2; • Desalination (KTZ): East Thanet (20Ml/d); and • Desalination (KTZ): East Thanet (20Ml/d) Phase 2.
Soil	Protect and enhance the functionality, quantity and quality of soils	No significant effects have been identified.

[12] Supply-side options that can be developed in a modular fashion, such as desalination options at 10Ml/d and 20Ml/d capacities, have been counted as discreet options.

[13] Demand management options such as smart metering have been counted once at the company level rather than 14 times at the WRZ level.

[14] Leakage reduction options such as mains renewal have been counted once at the company level rather than 14 times at the WRZ level.

SEA topic	SEA objective	Significant effects identified
Air	Reduce and minimise air emissions	No significant effects have been identified.
Water	Increase resilience and reduce flood risk	Significant negative effects have been identified for the flood risk SEA objective for the construction phase of one option located in the Hampshire Rural WRZ: • Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d).
	Protect and enhance the quality of the water environment and water resources	Significant negative effects have been identified for the water quality SEA objective for the operation phase for options located in the Sussex North WRZ, Sussex Hastings WRZ, Isle of Wight, Kent Medway West WRZ and Kent Medway East WRZ. For the following options this reflects the findings of non-compliance with the WFD (with medium confidence) in the WRMP24 WFD assessment (2025): • Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d); • Recycling (SHZ): Hastings to Darwell (15.3Ml/d); • Recycling (KMW): Medway WTW to lake (14Ml/d); and • Groundwater (KME): Recommission Gravesend (2.7Ml/d). Whilst for the following options, significant negative effects on this objective reflect the conclusions of the WFD and SEA (2025) of the Southern Water Drought Plan 2022: • Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d) • Drought option - supply side (IOW): Caul Bourne (1.5Ml/d); and • Drought option - supply side (KMW): River Medway Scheme 1-4 (17Ml/d).
	Deliver reliable and resilient water supplies	Significant positive effects have been identified in respect of the delivery of reliable water supplies in the operation phase, for the following options located within the Hampshire Winchester, Hampshire Southampton East and Hampshire Southampton West WRZs: • Bulk import (HWZ): T2ST to Yew Hill (95Ml/d); • Recycling (HSE) - Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d); • Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d); • Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d); • Drought option - supply side (HSW): River Test (80Ml/d); and • Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d).
Climatic Factors	Reduce embodied and operational carbon emissions	• No significant effects have been identified.
	Reduce vulnerability to climate change risks and hazards	No significant effects have been identified.
Landscape	Conserve, protect and enhance landscape, townscape and	No significant effects have been identified for this objective.

SEA topic	SEA objective	Significant effects identified
	seascape character and visual amenity	
Historic Environment	Conserve, protect and enhance the historic environment, including archaeological remains	No significant effects have been identified for this objective.
Population and Human Health	Maintain and enhance the health and wellbeing of the local community	A significant positive effect has been identified, associated with the maintenance of public water supplies in drought conditions within the Hampshire Southampton East WRZ as follows: • Drought option - supply side (HSE): Lower Itchen. Significant negative effects have been identified in respect of the health and well-being SEA objective in the operation phase of the Non-essential use bans options identified within each of the WRZ. Option as IDs: • Drought option - demand side (SNZ): NEUBs; • Drought option - demand side (SWZ): NEUBs; • Drought option - demand side (SBZ): NEUBs; • Drought option - demand side (HKZ): NEUBs; • Drought option - demand side (HAZ): NEUBs; • Drought option - demand side (IOW): NEUBs; • Drought option - demand side (HRZ): NEUBs; • Drought option - demand side (HWZ): NEUBs; • Drought option - demand side (HSE): NEUBs; • Drought option - demand side (HSW): NEUBs; • Drought option - demand side (KME): NEUBs; • Drought option - demand side (KMW): NEUBs; • Drought option - demand side (KTZ): NEUBs; and • Drought option - demand side (SHZ): NEUBs.
	Maintain and enhance tourism and recreation	No significant effects have been identified for this objective.
Material Assets	Minimise resource use and waste production	No significant effects have been identified for this objective.
	Avoid negative effects on built assets and infrastructure	No significant effects have been identified for this objective.

Seventeen generic demand management and leakage options have been assessed relating to:

- Policy Regulation: Implementation of changes to regulation and policy on building standards and appliances (All resource zones);
- Home Visits: Water use audit and inspection - household;
- Water Audits (Non-Households): Water use audit and inspection - Non-household;
- Enabler Activities Awareness Campaigns: Targeted water conservation information (advice on appliance water usage);

- Enabler Activities (Non-Households) Awareness Campaigns: Targeted water conservation information (advice on appliance water usage);
- Tariffs: Changes to existing measured tariffs - Volumetric charges;
- NHH Tariffs: Changes to existing measured tariffs - Volumetric charges;
- Water Efficiency Partnership Fund: Sponsoring Water efficiency enabling activities by others;
- Smart Metering: Enhanced metering - Household;
- Smart Metering USPL: Customer supply pipe leakage reduction;
- Smart Metering Unmeasured Households: Compulsory metering - Household;
- NHH Smart Metering: Enhanced metering - Non-household;
- Advanced Find & Fix: Leakage reduction - Active Leakage Control;
- Advanced Pressure Management: Leakage reduction - Pressure reduction programmes;
- Comms Pipe Replacement: Comms pipe leakage reduction;
- Digitalisation/Smart Networks: Leakage reduction - Active Leakage Control; and
- Mains Replacement (Net of NRR): Distribution main replacement.

The assessment of the above options is presented in **Section 5.7** (with the full assessment tables in Appendix J Demand Management and Leakage Options Assessments).

Significant effects have been identified for the revised demand management and leakage options, each covering all 14 WRZs. **Tables NTS5** summarises, by SEA topic, the likely significant effects identified for the demand management and leakage options.

Table NTS5: Significant effects identified by SEA topic and objective (post mitigation) for the demand management and leakage reduction options.

SEA Topic	SEA objective	Significant Effects Identified
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	No significant effects have been identified.
Soil	Protect and enhance the functionality, quantity and quality of soils	No significant effects have been identified.
Air	Reduce and minimise air emissions	No significant effects have been identified.
Water	Increase resilience and reduce flood risk	No significant effects have been identified.
	Protect and enhance the quality of the water environment and water resources	No significant effects have been identified.

SEA Topic	SEA objective	Significant Effects Identified
	Deliver reliable and resilient water supplies	Two significant positive effects, have been identified that relate to the operation and the following options: • Smart metering; and • Mains replacement (Net of NNR).
Climatic factors	Reduce embodied and operational carbon emissions	Significant negative effects were identified during construction for the following options: • Smart metering; • Digitalisation/Smart Networks; and • Mains replacement (Net of NNR). Two significant positive effects have been identified that relate to the operation and the following options: • Smart metering; and • Mains replacement (Net of NNR).
	Reduce vulnerability to climate change risks and hazards	Two significant positive effects have been identified that relate to the operation and the following options: • Smart metering; and • Mains replacement (Net of NNR).
Landscape	Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	No significant effects have been identified for this objective.
Historic environment	Conserve, protect and enhance the historic environment, including archaeological remains	No significant effects have been identified for this objective.
Population and human health	Maintain and enhance the health and wellbeing of the local community	Significant positive effects were identified during construction for the following options: • Smart metering; • Digitalisation/Smart Networks; and • Mains replacement (Net of NNR). Two significant positive effects have been identified that relate to the operation and the following options: • Smart metering; and • Mains replacement (Net of NNR).
	Maintain and enhance tourism and recreation	No significant effects have been identified for this objective.
Material assets	Minimise resource use and waste production	Significant negative effects were identified during construction for the following options: • Smart metering; • Digitalisation/Smart Networks; and • Mains replacement (Net of NNR).
	Avoid negative effects on built assets and infrastructure	No significant effects have been identified for this objective.

Cumulative effects

Cumulative effects of the revised preferred programme

For the preferred programme of options, cumulative significant positive effects have been identified for the resilient and reliable water supplies SEA objective and health and wellbeing SEA objective in the operation phase. This reflects the overall increased capacity of the water supply, and likely improvements to its resilience, across the Southern Water area delivered by the preferred programme of options as whole. No further cumulative significant positive effects were assessed.

Significant cumulative negative effects have been identified for the biodiversity SEA objective in the construction and operation phase. This reflects the works required in the construction phase and likely impacts, from, for example, disturbance to designated sites including SSSIs. Some cumulative minor positive effects have also been identified in the operation phase reflecting the achievement of at least 10% biodiversity net gain for some options.

The HRA concluded that for virtually all options, no adverse effects on European site[15] integrity are anticipated as a result of the options 'alone or in combination'; however, there are some minor residual uncertainties in relation to sites potentially affected by the desalination options that can only be resolved with more detailed investigations (although mitigation or avoidance measures will almost certainly be available given the long lead time before any potential in combination effects are realised).

Significant cumulative negative effects have also been identified for the water quality SEA objective in the operation phase which reflects the findings of the WFD assessment. Based on available information, the WFD assessment concludes that there may be cumulative effects resulting in WFD non-compliance, to a greater extent than for the options individually, for three catchments. These are the Arun, Ouse and Medway catchments. However, the nature and scale of those potential cumulative impacts will require further assessment.

Significant cumulative negative effects have also been identified for landscape in the construction phase. This reflects the likely cumulative impact of the construction works required to deliver the preferred programme of options as a whole and particularly the impact on designated landscapes (notably the South Downs National Park and North Downs National Landscape) in this phase. Construction impacts would be temporary in nature.

Significant negative effects have been identified for the carbon emissions SEA objective in the construction and operation phase. This reflects the scale of embodied carbon in, for example, construction materials, and emissions associated with vehicle movements during the construction phase. There will also be a significant generation of emissions associated with the ongoing operation of the options although some minor positive effects are also likely in the operation phase. Additionally, significant negative effects have been identified for the material assets SEA objective in the construction phase. This reflects the scale of the resources (including concrete, steel and plastics) required to construct the preferred programme of options.

No other significant effects have been identified for the preferred programme as a whole.

Cumulative effects with existing relevant plans, programme and projects

Cumulative effects have been considered in respect of:

- Regional and water resource management plans;

[15] Water company WRMPs are subject to the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations'). The 2017 Regulations have been amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 to reflect the UK's exit from the EU, although these largely carried forward the provisions and terminology of the 2017 Regulations and do not fundamentally alter their interpretation. This report therefore primarily refers to the 2017 Regulations and (where appropriate for clarity) the relevant provisions of the Habitats Directive. The term 'European site' is retained by the 2019 amendment and for all practical purposes the definition is essentially unchanged from the 2017 Regulations.

- Other plans (Environment Agency National Drought Plan, River Basin Management Plans (RBMPs), Shoreline Management Plans); and
- Strategic level projects.

In summary, there are potential cumulative/ in-combination effects between Southern Water's fdWRP24 and options within the fdWRMP24s of South East Water, SES Water and Thames Water related to either HRA or WFD assessment which should be given further consideration.

Section 6 of this report provides further information in relation to the assessment of the cumulative effects of the fdWRMP24.

Mitigation measures

Mitigation may be defined as a measure to limit the effect of an identified significant impact or, where possible, to avoid the adverse impact altogether. Consideration of mitigation measures has been an integral part of the SEA process and has informed development of the fdWRMP24. The assessments set out in this report (and its appendices) identify the residual impacts, i.e. those impacts likely to remain after the implementation of reasonable mitigation measures such as operation of water sources in line with regulatory requirements and the use of good construction practice, including measures such as:

- Minimise disturbance to biodiversity during the construction phase, for example by:
  - scheme design to minimise the environmental effects by 'designing to avoid' potential habitat features that may be important e.g. linear features such as hedges or stream corridors. large areas of scrub or woodland. mature trees. etc.) through scheme-specific routing studies.
  - the works programme and requirements for each measure should be determined at the earliest opportunity to allow investigation schemes, surveys and mitigation to be appropriately scheduled and to provide sufficient time for consultations with Natural England.
- Invasive species on site are to be identified and removed in advance of construction.
- Heavy Goods Vehicle (HGV) routing, cap on movements, appropriate working hours.
- Screening around the perimeter of works at the start of construction (creation of landscaping/planting for large scale construction).
- Footpath diversions established regarding construction work including pipelines.
- Resources for construction of the scheme would be sourced locally where possible.
- Minimising removal of spoil from construction sites.
- Runoff from the construction sites would be attenuated and the quality managed according to best construction practices.
- Appropriate pipeline laying techniques regarding river crossings.
- Flood risk management during construction (temporary flood defence and siting of spoil and contaminants away from areas at risk of flooding).
- Reflecting the importance of avoiding harm to heritage significance the siting of temporary and permanent works to minimise and where possible avoid, direct and indirect impacts on heritage and landscape features and their settings.
- Where appropriate, archaeological watching briefs during excavation.
- Noise abatement barriers where required.
- Dust control measures: dampening dust emissions from groundworks and vehicle washing.

The mitigation measures described above would, in some cases, be implemented through Environmental Impact Assessment (EIA) and planning process. In this way, effective mitigation plans can be developed to minimise many of the residual adverse effects currently identified in the SEA appraisals.

Section 7 of this report provides further information in relation to the mitigation of the effects of the fdWRMP24.

Consideration of reasonable alternatives

Southern Water has developed different plan options and tested these under different future growth and demand scenarios to address the future predicted supply deficits. Consistent with WRPG requirements, WRSE outputs and assessments and regulator feedback, Southern Water has selected the Least Cost (Cost Efficient) (LCP) Plan and Best Value Environment and Societal Plan (BESP) as reasonable alternatives to the preferred best value plan (BVP) to be subject to SEA.

Given the scale of the supply-demand deficit and challenges being faced, the investment model often selects the majority of schemes available for the LCP, and BESP as well as the BVP. As a result, there are limited differences between the options being selected, focused principally on phasing of options, although a few options are not selected.

At a plan level, the SEA found that there are no significant differences between the BVP and the alternative plans in terms of predicted effects. As a result, the summary of significant effects presented for the preferred programme (BVP) are also valid for the alternative plans.

Section 8 of this report provides further information in relation to the assessment of the reasonable alternatives to the fdWRMP24.

Conclusion

Southern Water's fdWRMP24 forecasts significant deficits in supply-demand balance through to 2075 (estimated to be 280.17 Ml/d in 2035 and 552.58 Ml/d in 2075 in the 1-in-500 year or 1:500 Dry Year Annual Average (DYAA) scenario) as a result of growth, climate change impacts and the need to reduce existing abstractions in order to maintain and enhance the environment. Southern Water is investigating the potential environmental impacts of a number of its existing sources under the Water Industry National Environment Programme (WINEP). The majority of these investigations will be complete by 2027 and will be used to determine the scale of any licence reductions needed to achieve Environmental Destination[16].

The forecast deficit will be addressed through the implementation of new options to increase supply as well as measures to reduce demand, including reduction in both leakage and water consumed by household and non-household customers. The supply-side and demand-side options considered are discussed in Annex 12 (Options Appraisal) and Annex 14 (Demand Management Strategy) accompanying the fdWRMP24.

Overall, the fdWRMP24 is considered to have significant positive operational effect against SEA objectives to: deliver reliable and resilient water supplies; and maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing. The additional design capacity for potable water that Southern Water would provide would help to ensure a continual supply of clean drinking water, supporting economic/population growth, generating a positive effect on human health and increasing adaptability to the effects of climate change.

The fdWRMP24 (post mitigation) is also considered to have a range of likely significant negative effects on the following SEA objectives:

- Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible);
- Protect and enhance the quality of the water environment and water resources;
- Reduce embodied and operational carbon emissions;

[16] Environmental Destination is a strategy developed at a regional level to help enhance the natural environment through water resources activities and sustainable abstraction (water removal)

- Conserve, protect and enhance landscape, townscape and seascape character and visual amenity;
- Minimise resource use and waste production.

These effects reflect the number, scale, proposed location and findings of the HRA and WFD assessments, including a precautionary view on the treatment of uncertainty. Many of the options have been revised from the dWRMP24 and rdWRMP24, with delivery delayed in the fdWRMP24 to allow sufficient time for investigation and consideration of additional mitigation options.

The HRA has concluded that for a number of options, adverse effects on integrity cannot be excluded. This reflects the desalination plant options concerning either construction (East Thanet, with potential effects arising from the proposed outfall being located within the Outer Thames Estuary SPA and potentially within the Margate and Long Sands SAC) and operation in relation to the hypersaline discharge related to the operation of the desalination schemes:

- Isle of Sheppey regarding impacts on the Medway Estuary and Marshes SPA and Ramsar and Thames Estuary and Marshes SPA and Ramsar;
- River Thames desalination regarding impacts on the Thames Estuary and Marshes SPA and Ramsar;
- East Thanet desalination scheme with regards to Outer Thames Estuary SPA and Margate and Long Sands SAC.

The revised earliest implementation dates of these options allow Southern Water to engage with other water companies to review the proposed desalination options on the north Kent coast, with the intention, to be reflected in future WRMPs of a revised, integrated sub-regional solution, providing substantial yield to the benefit of customers, but appropriately sited to avoid and minimise the range of current identified option and cumulative effects.

The WFD assessment found that the supply options could have effects on water quality affecting the ability of some waterbodies to meet WFD objectives. These issues could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature). Many of the options with potential non-compliance were assessed with low confidence. However, for four options, the WFD assessment concluded the potential for non-compliance with the WFD (with medium compliance). Some of these options involve effluent re-use schemes where the effluent would be discharged to a lake. The others involve a groundwater abstraction. There is limited detail available for these options, and subject to further investigation, it is possible that different conclusions could be drawn with more evidence. Further evidence and assessment is required, and is being progressed through the programme of work to reduce delivery risk as well as programmes to support the Hampshire Water Transfer and Water Recycling Project (HWTWRP) SRO. Given the significant lead in time for some options, it is considered to provide an adequate period with which to conclude such investigations and establish conclusions with which the regulator would concur.

When compared to the assessment of effects of the reasonable alternative plans, there are no significant differences between the Southern Water's fdWRMP24 and the alternative plans (the LCP and the BESP) in terms of the predicted cumulative effects. The alternative plans do not remove or add any additional significant effects not already identified for the BVP. However, changes in implementation dates could result in some differences as to when effects may occur, which may also have localised effects, but these would not affect the overall cumulative effects predicted for the plans.

Role of the SEA in developing the fdWRMP24

The SEA, along with the findings of the HRA and WFD assessment, have been used to help inform the development of the fdWRMP24, and enable the consideration of reasonable alternative options for inclusion in the plan and/or alternative phasing of implementing the different options. In summary, the application of these processes has:

- Informed dialogue with the Environment Agency and Natural England as to the options to be included in the fdWRMP24, their effects and potential for modifications.
- Identified a small number of options that have been excluded from the fdWRMP24 due to environmental and other concerns.
- Supported engineering design changes to six schemes to reflect further mitigation opportunities (Isle of Sheppey desalination, River Arun desalination, Thanet Coast desalination, River Test Managed Aquifer Recharge, Pulborough to Havant Thicket Reservoir transfer, SES to SNZ transfer).
- Fostered sub-regional discussions and commitments to refinement of the proposed desalination options on the north Kent coast, with the intention, to be reflected in future plan cycles, of a revised, integrated solution, providing substantial yield to the benefit of customers, but appropriately sited to avoid and minimise the range of current identified option and cumulative effects.

Monitoring the effects of the WRMP24

Once the WRMP is implemented, its effects on the environment and people will need to be monitored. Monitoring the significant effects of the WRMP can help to answer questions such as:

- Were the SEA predictions of effects accurate?
- Is the WRMP contributing to the achievement of the SEA objectives?
- Are mitigation measures performing as well as expected?
- Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?

Section 9 of this report identifies a number of potential indicators that could be used for monitoring the effects of the WRMP's implementation. These proposed indicators would form the core component of a monitoring programme to assess whether the identified effects in the SEA are occurring as anticipated, or whether it is giving rise to greater or lesser effects (adverse or beneficial). In turn, the monitoring may identify changes to the mitigation measures necessary to minimise adverse effects and/or modifications to scheme design or operation to further augment beneficial effects.

As options are brought forward for development, further specific monitoring requirements may be set out in detailed designs and plans accompanying scheme development (including, where applicable, formal applications for any required environmental permits or abstraction licences, planning permission, as well as any scheme-specific HRA and WFD assessments). These will be discussed with relevant regulatory and statutory bodies and stakeholders to agree the appropriate scale and duration of such scheme-specific requirements. Monitoring proposals will be considered further and a final monitoring framework that satisfies the requirements of the SEA Regulation will be presented in the Post Adoption Statement.cSection 9 of this report provides further information in relation to the proposed measures for monitoring the effects of the fdWRMP24. c

Quality assurance

The Government's guidance on SEA[17] contains a quality assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in Appendix A Quality Assurance Checklist, demonstrating how this Environmental Report meets these requirements.

Next steps

This Environmental Report is being issued for further consultation to the SEA consultation bodies (the Environment Agency, Historic England and Natural England) and provided as part of the evidence base to support the public consultation on the fdWRMP24.

[17] Office of the Deputy Prime Minister (2005) *A Practical Guide to the Strategic Environmental Assessment Directive*.

Following consultation and an analysis of responses and any further work, Southern Water will produce a final WRMP24. This will be submitted to Government. Following receipt of Government direction, Southern Water will publish the Final WRMP24. In conjunction with publishing the final WRMP24, Southern Water will also issue an SEA post adoption statement. This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final WRMP24.

Once the final WRMP24 has been published, the preferred options for managing water supply and demand contained in it will need to be implemented through specific projects. As part of this process, each project may be subject to further assessment to understand and manage its potential environmental and social impacts. These assessments, which may include HRA and EIA, will take account of the issues discussed in this report but will also be informed by the greater detail available as the work progresses about construction techniques, building materials, agreed locations and routes.

1 Introduction

1.1 Background and purpose of report

This Strategic Environmental Assessment (SEA) Environmental Report has been prepared in support of the development of Southern Water's Water Resources Management Plan 2024 (WRMP24). A Habitats Regulations Assessment (HRA) and a Water Framework Directive (WFD) assessment have also been carried out in parallel.

SEA is a statutory requirement for plans or programmes which could have significant environmental implications and helps to identify where there are potential impacts and how any negative impacts might be mitigated. More information about SEA, and its role in supporting the development of the WRMP24 is provided in **Section 1.2**.

This Environmental Report presents the findings of the SEA of Southern Water's final draft Water Resource Management Plan 2024 (fdWRMP24). The purposes of the report are:

- to ensure that the likely significant environmental and socio-economic effects of the fdWRMP24 and any reasonable alternatives are identified, characterised and assessed;
- to help identify appropriate measures to avoid, reduce or mitigate adverse effects and to enhance beneficial effects associated with the implementation of the fdWRMP24 wherever possible;
- to provide a framework for monitoring the potential significant effects arising from the implementation of the fdWRMP24;
- to give the statutory consultees, stakeholders and the wider public the opportunity to review and comment upon the environmental effects that the fdWRMP24 may have on them, their communities and their interests, and to encourage and support them to make responses and suggest improvements to the fdWRMP24;
- to inform Southern Water's decisions on the fdWRMP24; and
- to demonstrate that the fdWRMP24 has been developed in a manner consistent with the requirements of the SEA Regulations.

This Environmental Report presents the review of relevant policies and plans (Section 2) and the baseline environment information (Section 3) that set the context for the assessment that has been carried out in accordance with the assessment methodology (Section 4). The potential effects of the fdWRMP24's revised preferred options are described in Sections 5, with assessment of the cumulative, or in-combination, effects between fdWRMP24 measures and other activities, programmes and plans set out in Section 6. Information regarding mitigation is included in Section 7 and the assessment of reasonable alternatives in Section 8. Information on monitoring measures is provided in Section 9. A quality assurance checklist is provided in Appendix A Quality Assurance Checklist**.**

This Environmental Report has been updated from the report that presented the findings of the SEA that accompanied the revised draft WRMP24 (rdWRMP24) and was subject to consultation between September and December 2024.

1.2 Application of SEA to the WRMP24

1.2.1 Overview of Strategic Environmental Assessment

SEA became a statutory requirement in the UK following the adoption[18] of Directive 2001/42/EC (the SEA Directive) on the assessment of effects of certain plans and programmes on the environment. The Directive was transposed into national legislation by The Environmental Assessment of Plans and Programmes Regulations 2004 (referred to as the SEA Regulations)[19].

SEA is a systematic decision support process, aiming to ensure that the likely significant environmental effects of plans and programmes are identified, described and assessed to avoid, manage or mitigate any significant adverse effects and to enhance any beneficial effects. In this context, the purpose of SEA is to encourage relevant plan authors to integrate environmental considerations into the development of any plan or programme. Generally, a SEA is therefore conducted before an Environmental Impact Assessment (EIA) is undertaken.

1.2.2 Requirement for SEA of Southern Water's WRMP24

The SEA Regulation 5 requires "an environmental assessment … of certain plans and programmes which are likely to have significant effects on the environment". Plans and programmes are defined as those:

"*which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government; and which are required by legislative, regulatory or administrative provisions*" (Regulation 2 (1)).

Guidance produced by the European Commission (EC)[20] indicates that in preparing plans for ensuring water resources, privatised utilities companies can be considered an authority because they are providing services that would be carried out by public authorities in a non-privatised regime. The preparation of a WRMP is a statutory requirement and therefore meets the requirements of Regulation 2.

Plans and programmes that may have significant effects on the environment are identified as those:

"*which are prepared for… water management… and which set the framework for future development consent of projects listed in Annexes I and II to Directive 85/337/EEC* [the Environmental Impact Assessment Directive]; *or*

which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of Directive 92/43/ EEC [the Habitats Directive]" (Regulation 5 (2)).

[18] EU law has ceased to apply in the UK under the terms of the Withdrawal Agreement and EU Treaties. The European Union (Withdrawal) Act 2018 (EUWA) has established a new body of domestic law known as retained EU law. Any references to EU Directives in this report should be read as references to the domestic legislation that implemented the Directive (including that domestic legislation as it is revised or replaced from time to time).

[19] The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No. 1633) apply to any plan or programme which relates solely or in part to England.

[20] EC (2003) *Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment.* Available online: http://ec.europa.eu/environment/archives/eia/pdf/030923_sea_guidance.pdf

Broadly, this includes plans that may include development of infrastructure to source, store, transfer or manage water, or may affect European Sites[21] (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Ramsar sites).

Government[22], regulator[23] and industry[24] guidance indicates that there is a requirement for water companies, as responsible authorities, to determine if their WRMPs fall within the scope of the SEA Regulations and whether a SEA must be undertaken.

1.2.3 Applying SEA to Water Resource Management Plans

Southern Water's WRMP24 is subject to SEA. SEA is required based on the scope of the potential effects that could arise, particularly given the number and area covered by European designated conservation sites in the operational area covered by the WRMP. In this context, the purpose of the SEA of the fdWRMP24 is to:

- identify the potentially significant environmental effects of the fdWRM24 in terms of the water resource management options being considered;
- help identify appropriate measures to avoid, reduce or manage adverse effects and to enhance beneficial effects associated with the implementation of the draft plan wherever possible;
- give the statutory SEA bodies, stakeholders and the wider public the ability to see and comment upon the effects that the draft plan may have on them, and encourage them to make responses and suggest improvements to the draft plans; and
- inform the development of the final version of the WRMP24.

In summary, the SEA identifies, describes and assesses the likely significant effects arising from the following aspects of the WRMP24:

- the constrained water resource options;
- the preferred water resources options;

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[21] Water company WRMPs are subject to the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations'). The 2017 Regulations have been amended by the *Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019* to reflect the UK's exit from the EU, although these largely carried forward the provisions and terminology of the 2017 Regulations and do not fundamentally alter their interpretation. This report therefore primarily refers to the 2017 Regulations and (where appropriate for clarity) the relevant provisions of the Habitats Directive. The term 'European site' is retained by the 2019 amendment and for all practical purposes the definition is essentially unchanged from the 2017 Regulations. European sites are therefore: any Special Area of Conservation (SAC) from the point at which the European Commission and the UK Government agreed the site as a 'Site of Community Importance' (SCI) (if this was before 31 Jan 2020); any classified Special Protection Area (SPA); and any candidate SAC (cSAC). However, the term is also commonly used when referring to potential SPAs (pSPAs), to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') are applied; and to possible SACs (pSACs) and listed Ramsar Sites, to which the provisions of the Habitats Regulations are applied as a matter of Government policy (NPPF para. 194) when considering development proposals that may affect them. "European site" is therefore used in this document in its broadest sense, as an umbrella term for all of the above designated sites. Note, it is likely that this term will be supplanted at some point in the future although an appropriate UK-wide alternative has not yet been established (e.g. the NPPF in England has adopted the term 'Habitats sites' to refer collectively to those sites defined by Regulation 8; the *Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019* replaces 'Natura 2000' with the 'National Site Network').

[22] Office of the Deputy Prime Minister (ODPM), Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland (2005) A *Practical Guide to the SEA Directive and European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites*

[23] UK Government (2023) *Water Resource Planning Guideline* [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline

[24] UKWIR (2021) *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans*. Report Ref. No. 21/WR/02/15

- the preferred programme of options selected to comprise the preferred plan to address the supply demand deficit;
- any cumulative, secondary and/or synergistic effects of implementing the plans;
- any alternative plans proposed to address the supply demand deficit.

Where relevant, any assessment work that has already been completed e.g., as part of the RAPID[25] gated submission process for the SROs, this will be used to inform the assessments of the options as they are presented.

[25] Regulators Alliance for Progressing Infrastructure Development (RAPID) was established in 2019 to "*help accelerate the development of new water infrastructure and design future regulatory frameworks. The joint team is made up of the 3 water regulators Ofwat, Environment Agency and Drinking Water Inspectorate".* Available online https://www.ofwat.gov.uk/regulated-companies/rapid/3/

1.3 Southern Water supply area and the WRMP24

1.3.1 Southern Water's supply area

Southern Water provides water supplies to nearly 2.6 million customers across an area of 4,450km^2, extending from East Kent, through parts of Sussex, to Hampshire and the Isle of Wight in the west.

Water supplies are predominantly reliant on the transmission and storage of groundwater from the widespread chalk aquifer that underlies much of the region. This extends throughout parts of Kent, Sussex, Hampshire and the Isle of Wight; and makes up 70% of the total water supply. River abstractions account for 23% of the water supplies, most notably the Eastern Yar and Medina on the Isle of Wight, the Rivers Test and Itchen in Hampshire, the Western Rother and Arun in West Sussex, the River Eastern Rother and River Brede in East Sussex, and the River Teise, River Medway and Great Stour in Kent. Four surface water impounding reservoirs provide the remaining 7% of water supplies: Bewl Water, Darwell, Powdermill and Weir Wood. The total storage capacity of these four reservoirs amount to 42,390Ml. South East Water is entitled to 25% of the available supplies from the River Medway Scheme, which incorporates Bewl Water Reservoir. Although the South East is one of the driest regions in the UK, rainfall is still integral to the maintenance of water supplies. During winter, when most of the effective rainfall occurs, groundwater reserves are recharged naturally through infiltration processes. Rain infiltrates through the soil to recharge the natural storage in the underlying groundwater to support river baseflows for the following year. Annual rainfall averages 730mm across the Southern Water region. Rainfall experienced outside of winter is of less value to groundwater recharge as it is mostly lost to evaporation, plant transpiration or runs off directly into rivers from the land. The Southern Water region is divided into fourteen Water Resource Zones (WRZs) which are geographically separate and amalgamated into three larger, sub-regional areas (see Figure 1):n**Western area** - comprising the following seven WRZs: nHampshire Near Basingstoke (HKZ);

- Hampshire Andover (HAZ);
- Isle of Wight (IOW);
- Hampshire Rural (HRZ);
- Hampshire Winchester (HWZ);
- Hampshire Southampton East (HSE);
- Hampshire Southampton West (HSW).

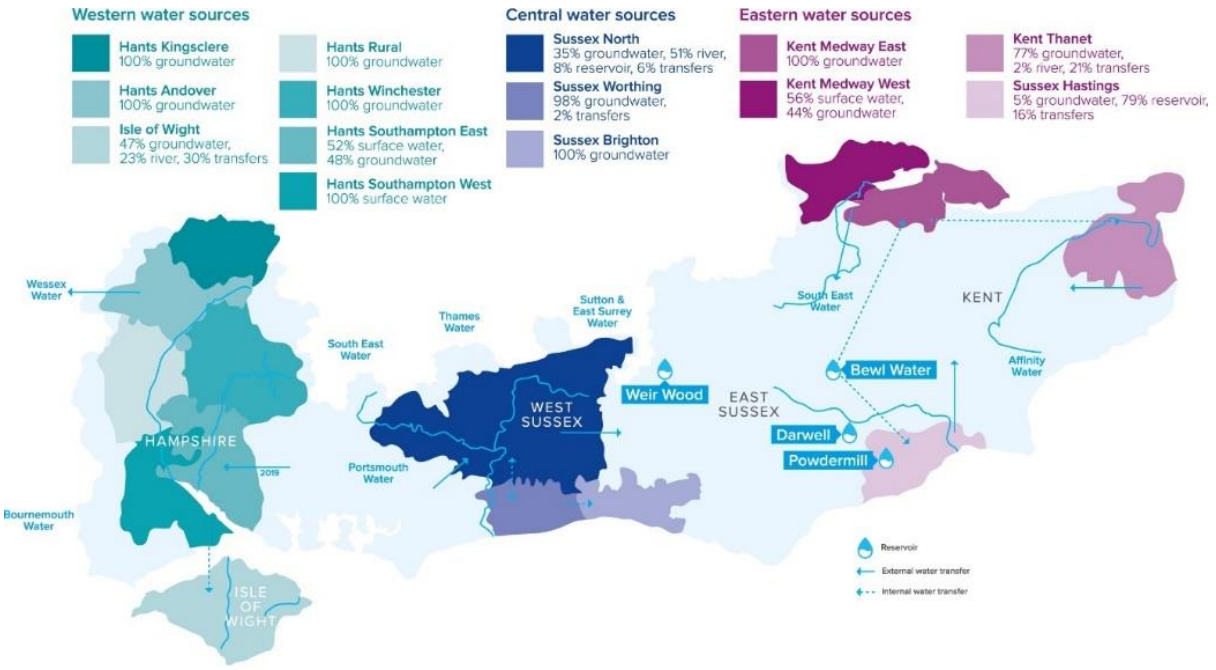
Central area - comprising the following three WRZs:

- Sussex North (SNZ);
- Sussex Worthing (SWZ);
- Sussex Brighton (SBZ).

Eastern area - comprising the following four WRZs:

- Kent Medway East (KME);
- Kent Medway West (KMW);
- Kent Thanet (KTZ);
- Sussex Hastings (SHZ).

Figure 1: Southern Water's supply area.

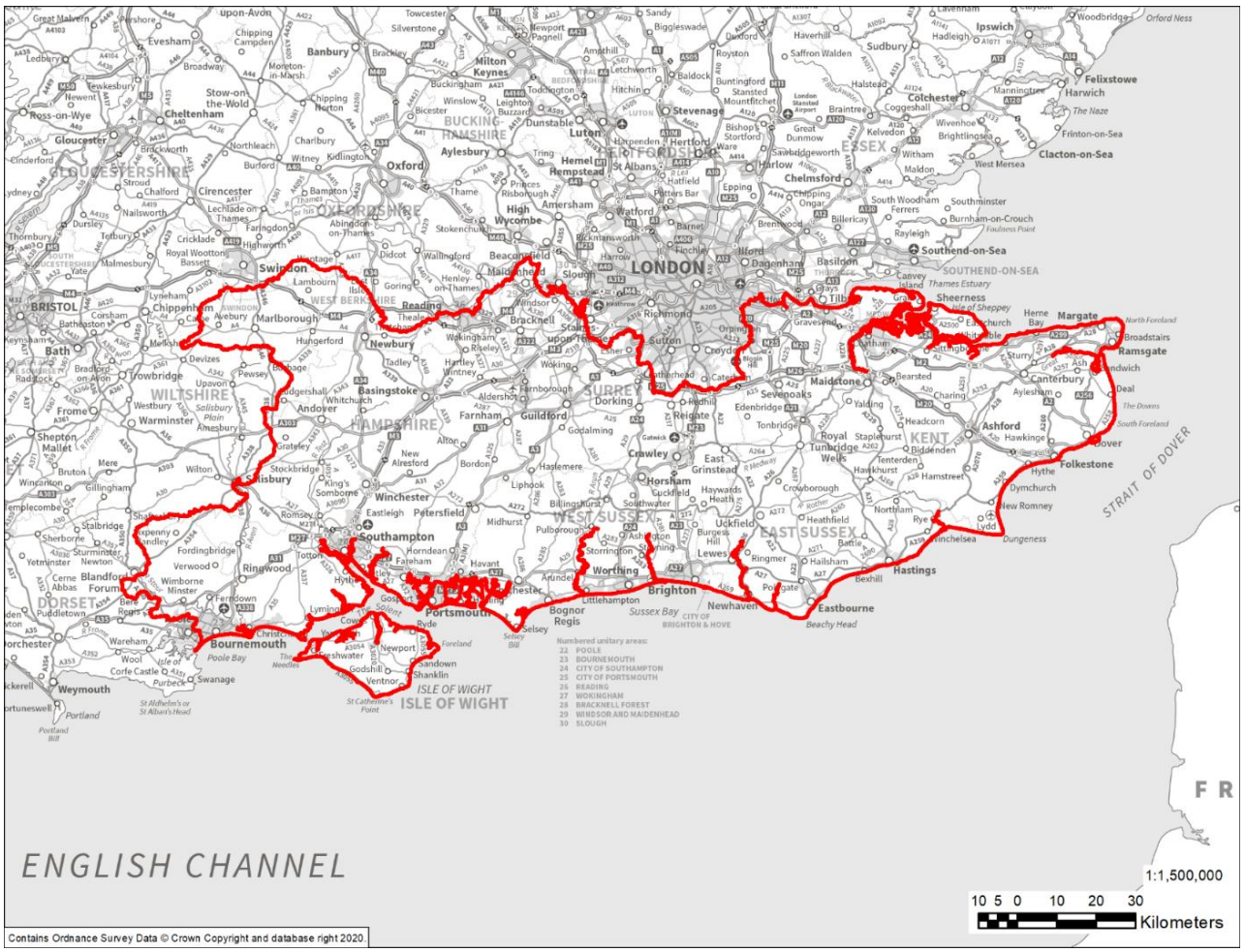


A number of bulk water supplies are made between Southern Water and several adjacent water companies. Southern Water's supply area is bounded by eight other water companies:

- Affinity Water;
- Cholderton and District Water;
- Portsmouth Water;
- SES Water;
- South East Water;
- South West Water;
- Thames Water;
- Wessex Water.

The geographical area under consideration for the SEA covers all of Southern Water's WRZs as well as the river and/or groundwater catchments of those water sources and sources of bulk water supply imports that serve these WRZs but which lie outside their boundaries (see Figure 2).

Figure 2: SEA area under consideration.



1.4 Southern Water's WRMP process

1.4.1 Overview

Water resources management planning is undertaken by all water companies in England and Wales in order to ensure reliable, resilient water supplies over the long-term planning horizon. The process includes working out and forecasting how much water customers will need over the planning period (assessing demand) and how best to provide it (assessing options to reduce or constrain demand growth and/or augment reliable supplies of water) in an efficient, timely manner (programme appraisal). Companies identify the preferred, 'best value' programme of demand management and water supply options to develop an overall strategy to maintain a balance between reliable supply and demand in each WRZ and for their supply area as whole (the WRMP). Water companies in England and Wales have a statutory requirement to prepare a WRMP every five years. Each water company's WRMP sets out how the balance between water supply and demand, and security of supply, will be maintained over a minimum of 25 years in a way that is economically, socially and environmentally sustainable. This will include public water supply (PWS) and non-public water supply (non-PWS).

1.4.2 WRMP24 objectives

The over-arching 'best value' planning objectives to meet statutory and policy requirements are:

- Deliver a secure and wholesome supply of water;

- Deliver environmental and social benefit;
- Increase the resilience of water systems;
- Deliver at a cost that is acceptable to customers.

Table 1-1 sets out these objectives and the associated criteria and metrics for the delivery of the WRMP[26].

Table 1-1 WRMP objectives, criteria and metrics.

Best value objective	Criteria	Metric
Deliver a secure and wholesome supply of water to customers and other sectors to 2100	Meet the supply demand balance	Public water supply - supply demand balance profile (Ml/d) Provides additional water needed by other sectors (Ml/d)
	Leakage	50% reduction in leakage by each company by 2050 from 2017-18 baseline (%) % leakage reduction above 50%
	Water into supply	Distribution input (DI) per property (litres per day)
	Customer preference	Customer preference for option type (score)
Deliver environmental improvement and social benefit	Strategic Environmental Assessment (SEA)	Programme benefit (score max) Programme disbenefit (score min)
	Natural capital	Enhancement of natural capital value (£m)
	Abstraction reduction	Reduction in the volume of water abstracted at identified sites (Ml/d) and by when (date)
	Biodiversity	Net gain score (%)
	Carbon	Cost of carbon offsetting (£m)
Increase the resilience of the region's water systems	Drought resilience	Achieve 1-in-500 drought resilience (date achieved)
	Resilience assessment reliability	Programme reliability score
	Resilience assessment adaptability	Programme adaptability score
	Resilience assessment evolvability	Programme evolvability score
Deliverable at a cost that is acceptable to customer	Programme cost	Net present value (£m) using the social time preference rate (STPR)
	Inter-generational equity	Net present value (£m) using the long-term discount rate (LTDR)

1.4.3 WRMP24 development

National guidance[27] requires alignment of water company WRMPs with the regional plan. In consequence, Southern Water has worked with Water Resources South East (WRSE), a collaboration of the six[28] water companies that supply water in south east England, to develop and apply a consistent framework for water resource plan development, with work split between the regional and company level. This included the following stages:

1. Prepare supply-demand balance information.

[26] Final Draft Water Resources Management Plan 2024: Technical Report, May 2025

[27] UK Government (2023) *Water Resource Planning Guideline* [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline.

[28] Affinity Water, Portsmouth Water, SES Water, South East Water, Southern Water and Thames Water

2. Develop a list of options that considers government policy and aspirations.
3. Undertake problem characterisation and evaluate strategic needs and complexity.
4. Decide on a modelling method.
5. Identify and define data inputs to model(s).
6. Undertake modelling to inform decision-making.
7. Carry out sensitivity tests.
8. Produce a final planning forecast.

Steps 1-3 have primarily been undertaken by member water companies individually. WRSE has progressed steps 4-8 after agreeing on an approach with members and consulting on the overall method with other stakeholders.

In line with the steps identified, Southern Water has developed a supply-demand balance to identify those water resource zones[29] (WRZs) in deficit over the lifetime of the plan (and so where additional water resources are required). The WRMP presents options for the resolution of the WRZ deficit. Option selection for the revised draft WRMP entails the following steps:

- Identification of an **unconstrained list** of options.
- Screening and filtering of the list against initial screening criteria to develop a **feasible list**.
- Options that are impractical or have unacceptable environmental or economic impacts are removed. Screening against final screening criteria to arrive at a **constrained list**. Constrained options are taken forward into the decision-making modelling process.
- **Environmental assessment** of the options as part of the Strategic Environmental Assessment (SEA), Habitats Regulations Assessment (HRA) and WFD assessment processes.

The unconstrained list of options is a high-level list including generic types, taking account of government policy and aspirations. It includes options and studies from past WRMPs as well as new ones identified through consultation with customers and stakeholders. Each unconstrained option was assessed against an initial set of screening criteria to see if it should be taken forward to the feasible list of options. The purpose of this screening process is to remove options that are impractical or have unacceptable environmental or economic impacts.

The unconstrained list of options was assessed against the following criteria:

- **Will the option deliver beneficial environmental outcomes, whether on its own or in combination?** Does it provide additional benefits such as improved water quality, reduced flood risk or improved catchment management, over and above the objective of improving water resources? Can it contribute to environmental sustainability?
- **Would the option provide enhanced resilience through broadening types or locations of water resources available for supply?** This could include links to areas or sources that may respond differently to certain drought conditions or a resource that is not weather dependent (e.g. desalination or water recycling).
- **Can the option be delivered in a phased or modular way?** This increases the flexibility of the option in response to future changes in the forecast supply-demand balance.

[29] UK Government (2023) *Water Resource Planning Guideline [online*]. Available at: https://www.gov.uk/government/publications/waterresources-planning-guideline/water-resources-planning-guideline

Section 4.4. of the WRPG defines a water resource zone as “an area within which the sources of water and distribution of water to meet demand, is largely self-contained (with the exception of agreed bulk transfers)”.

- **Is the option likely to be technically feasible?** For example, the location of aquifer storage and recovery (ASR) options would be limited to locations with suitable geology.
- **Does the option help address our water resources planning problem, or could it be used to provide a regional benefit?** Can it provide water or water saving in the WRZ, or can it provide a direct or conjunctive use water resource benefit with a neighbouring water company.
- **Is the option likely to meet both customer and regulator expectations?** If an option is likely to meet public resistance or may contravene environmental and planning restrictions, government policy or impact upon WFD non-deterioration objectives, then it may need to be omitted or given a longer timeline for implementation.
- **What is the indicative cost and capacity of the option and when is it likely to become available?** If an option is disproportionately expensive or its capacity is too small to be suitable/practicable to meet the projected supply-demand deficit or part of it then it may not be considered viable. Similarly, an option is also assessed in terms of the time required to develop and achieve benefit from it. If an option cannot be developed in time, then we would look for alternatives that can.
- **Is the option likely to be particularly risky to implement, or the output highly uncertain?** This considers aspects like land availability, deliverability of the option in terms of achieving the estimated output, the availability and reliability of the required technology and experience within the company in developing and operating similar options. It also looks at confidence in the lead-in time required to develop the option, the likely spend profile and the nature and amount of environmental and engineering work required at each stage from planning to delivery.

Options that progressed to the feasible list were subject to a further screening process to produce a constrained options list, which included consideration of the water resource problem faced in each WRZ, and the flexibility of options for investment modelling. For example:

- Are there are sufficient options in each WRZ?
- Is there sufficient connectivity?
- Do the options contain enough granularity (i.e. different sizes of options)?
- Is there a need for modular options?
- Is the granularity of those modular options sufficient?

Each option was assessed against the following criteria:

- **Monetised costs and benefits:** economic assessment of each option and engineering judgement.
- **Non-monetised costs and benefits:** environmental and social factors.
- The opportunity to employ **mitigation measures** in cases where environmental and/or social impacts are identified.
- **Dependencies** or **mutual exclusivities** with other options and potentially with third parties, including neighbouring water companies.
- The **adaptability** of the option to future uncertainties, and/or the possibility to be implemented in a phased way. This includes assessing the risk to delivery from an extended programme that may spread over multiple AMP periods, before a scheme is implemented.
- The **reliability** and **resilience** of the option i.e. its vulnerability to future regulatory changes, climate change and increasingly severe droughts.

Screening against these criteria has led to the identification of the feasible options list. Constrained options are taken forward into the decision-making modelling process. All the options on the constrained options list are considered to be viable and potentially deliverable and are, therefore, made available for selection in the

investment modelling process. The constrained options are subject to more detailed engineering and environmental assessment, to provide consistent and comparable information as an input to the selection of options for the fdWRMP24 which includes investigations and assessments to provide:

- engineering description and designs to calculate a cost;
- the earliest potential start date, taking account of construction complexity, likely planning constraints and risks, and environmental and other investigations likely to be required to implement the scheme;
- likely costs - capital expenditure, operating and financing costs;
- carbon emissions - embodied carbon (the lifecycle carbon emissions of materials used in construction) and operational carbon (emitted through operation of the scheme over its lifetime);
- environmental and social considerations - impacts and costs informed by the Strategic Environmental Assessment (SEA), more general environmental assessment, Habitats Regulations Assessment (HRA) and its ability to meet the WFD objectives;
- the water savings across a range of potential drought event scenarios.

The options selected by the investment model, under various planning scenarios in each WRZ, form the list of 'preferred options' in the fdWRMP24.

Types of water resource management options considered to meet any forecast deficit in a WRZ can include:

- **Customer options** which include measures to manage the demand for water such as smart meters, rainwater harvesting, greywater recycling or household visits to install water efficiency measures;
- **Distribution options** which include measures to optimise the efficiency of water networks, reduce leakage and minimise any unscheduled resource losses;
- **Production options** include measures to increase the efficiency and effectiveness of treatment processes;
- **Resource management options** which include measures to increase supply such as greater peak output at existing groundwater sources, reservoir or surface water supply and which will include SROs; this also includes catchment management options, for example nature-based solutions;
- **Non-PWS options** which include any options which increase water resource availability or reduce the need for abstraction outside of that needed for public water supplies.

The preferred plan options that collectively comprise the proposed plan programme. In developing the preferred programme, consideration is given to alternative plan programmes (or pathways) developed in response to different scenarios, to resolve any supply deficits in relation to financial, environmental and social costing and, potentially, to facilitate water trading between companies.

1.4.4 SWS Final Draft WRMP24

To meet the challenge of securing sustainable, long-term water supplies and to protect the environment, Southern Water strategy is built on four pillars that work in tandem to deliver a step change in water resources planning:

- Efficient use of water and minimal wastage across society;
- New water sources that provide resilient and sustainable supplies;
- A network that can move water around the region;
- Catchment and nature-based solutions that improve the environment.

The overall aims of the fdWRMP24 are to:

- reduce consumption by household customers in order to reduce average per capita consumption (PCC) to 110 litres per head per day by 2044-45 under dry year conditions. This is 5 years earlier than the 2049-50 target year set by the Government;
- reduce leakage by 53% by 2049-50 compared to the reported leakage in 2017-18. The is higher than the 50% reduction required by the Government;
- reduce non-household consumption by 9% compared to the reported figure in 2019-20 by 2037-38;
- promote catchment and nature-based solutions through the Catchment First programme to improve environmental resilience;
- stop the use of all supply-side drought permits and orders by 2040-41 at the latest, unless faced with a drought of more than 1-in-500 year severity.

The **Western area** strategy involves:

- continuation of all existing internal transfers as well as external bulk imports and exports;
- implementing water efficiency programmes to reduce household and non-household consumption from 2025-26 to reduce consumption by 39.2 million litres per day (Ml/d) by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- implementing leakage reduction measures from 2025-26 to reduce leakage by 9.9Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- removing constraints at Newbury groundwater source to increase yield (1.2Ml/d) from 2027-28;
- drilling new boreholes at Romsey to provide 4.8Ml/d from 2030-31;
- removing constraints and Kings Sombourne groundwater source to provide up to an additional 2.5Ml/d from 2030-31;
- increasing transfer capacity between Hampshire Rural and Hampshire Southampton West water resource zones through the Romsey Town and Broadlands valve to transfer an additional 5Ml/d from 2030-31;
- delivering Sandown Wastewater Treatment Works recycling scheme to provide up to 8.5Ml/d from 2030-31;
- constructing the 'Hampshire grid' to move water more easily in the Hampshire area from 2030-31;
- bulk import (up to 21Ml/d) from Portsmouth Water to Itchen Water Supply Works from 2031-32 following the construction of Havant Thicket Reservoir;
- bulk import (up to 90Ml/d) from Havant Thicket Reservoir to Itchen Water Supply Works from 2034-35 following the delivery of Hampshire Water Transfer and Water Recycling Project;
- implementing Test Managed Aquifer Recharge scheme to provide up to 5.5Ml/d from 2035-36;
- drilling new boreholes at Newchurch groundwater source to increase yield by 1.9Ml/d from 2036-37;
- drilling new boreholes at Eastern Yar3 groundwater source to increase yield by 1.5Ml/d from 2039-40;
- bulk import (up to 120Ml/d) into Hampshire through Thames to Southern Transfer from 2039-40;
- terminating the use of Lower Itchen Drought Permit/Order after 2029 -30;
- terminating the use of Candover Drought Order after 2033-34;
- terminating the use of River Test Drought Permit/Order after 2033-34 under droughts of up to 1-in-200 year severity;
- terminating the use of all supply-side drought permits/orders after 2040-41 unless faced with a drought of more than 1-in-500 year severity;
- continuing to use Temporary Use Bans and Non-Essential Use Bans to manage demand during droughts.

The **Central area** strategy includes:

- continuation of all existing internal transfers as well as external bulk imports and exports;

- implementing water efficiency programme to reduce household and non-household consumption from 2025-26 by 35.8Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- implementing leakage reduction measures from 2025-26 to reduce leakage by 7.6Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- bulk import from SES Water (up to 4Ml/d) from 2025-26 to 2030-31;
- reinstating West Chiltington groundwater source to provide up to 3.1Ml/d from 2028-29;
- refurbishing Petersfield groundwater source to provide up to 1.6Ml/d from 2028-29;
- terminating the use of Pulborough surface water drought permit/order after 2029-30 under droughts of up to 1-in-200 year drought severity;
- delivering a new treatment works at Weir Wood Reservoir with a 21Ml/d capacity from 2030-31
- drilling new boreholes at Petworth to provide up to 4Ml/d from 2030-31;
- asset enhancement at Lewes Road groundwater source to provide up to 3.5Ml/d from 2030-31;
- recycled water from Littlehampton Wastewater Treatment Works (up to 15Ml/d) from 2030-31;
- bulk import from SES Water of up to 10Ml/d from 2033-34;
- bulk import (up 10Ml/d) from South East Water to Pulborough from 2039-40;
- bulk import (up to 50Ml/d) from Havant Thicket Reservoir to Pulborough from 2039-40;
- building pipeline to transfer up to 35Ml/d between Pulborough and Worthing from 2039-40;
- improving treatment capacity at Pulborough to provide up to 2Ml/d from 2040-41;
- building pipeline to transfer up to 4Ml/d between Worthing and Brighton from 2040-41;
- building a desalination plant close to the River Arun to provide benefit from 2040-41 to deliver up to 40Ml/d by 2049-50;
- construction of River Adur Offline Reservoir to provide up to 19.5Ml/d from 2045-46;
- use of recycled water from Horsham Wastewater Treatment Works with storage at Pulborough to provide up to 11.5Ml/d from 2057-58;
- bulk import (up to 20Ml/d) from South East Water to Brighton from 2065-66;
- terminating the use of all supply-side drought permits/orders after 2040-41 unless faced with a drought of more than 1-in-500 year severity;
- continuing to use Temporary Use Bans and Non-Essential Use Bans to manage demand during droughts.

The **Eastern area** strategy involves:

- continuation of all existing internal transfers as well as external bulk imports and exports;
- implementing water efficiency programme to reduce household and non-household consumption from 2025-26 to reduce demand by 37.4Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- implementing leakage reduction measures from 2025-26 to reduce leakage by 10.9Ml/d by 2049-50 excluding the impact of New Appointments and Variations on future growth;
- recycling from Medway Wastewater Treatment Works for up to 14Ml/d from 2030-31;
- recycling from an industrial source in Sittingbourne (7.5M/d) from 2030-31;
- recommissioning Gravesend groundwater source (2.7Ml/d) from 2030-31;
- conjunctive use of Bewl Water with recycled water from Tonbridge Wastewater Treatment Works to provide up to 5.7Ml/d from 2035-36;
- reconfiguring Rye Wells to provide up to 1.5Ml/d benefit from 2039-40;
- developing a desalination plant on the Thames Estuary from 2039-40 to provide up to 40Ml/d;
- developing a desalination plant on the Isle of Sheppey to provide up to 20Ml/d from 2040-41, increasing to 30Ml/d by 2062-63;

- developing a desalination plant in East Thanet to provide 20Ml/d from 2040-41, increasing to 40Ml/d by 2049-50;
- bulk import (up to 20Ml/d) from South East Water to near Canterbury from 2049-50;
- bulk import (up to 10Ml/d) from South East Water to Rye from 2049-50;
- conjunctive use of Darwell Reservoir with recycled water from Hastings Wastewater Treatment Works (up to 6.8Ml/d) from 2050-51;
- raising Bewl Water by 0.4m for up to 3Ml/d benefit from 2060-61;
- terminating the use of all supply-side drought permits/orders after 2040-41 unless faced with a drought of more than 1-in-500 year severity;
- continuing to use Temporary Use Bans and Non-Essential Use Bans to manage demand drought droughts.

Once the final WRMP24 has been published, the selected schemes for water resource management will need to be implemented through specific projects. As part of this process, further study, investigations and assessment will be undertaken to understand and manage the potential environmental and social impacts. These assessments, which may include HRA and EIA, will take account of the issues discussed in this Environmental Report but will also be informed by the greater detail available as the work progresses about option design, siting and pipeline routing, construction methods and scheme operation. All will be supported by active engagement with the relevant regulators.

1.4.5 Changes from the draft WRMP24 (2023) and revised draft WRMP24 (2024)

As a result of further modelling carried out by WRSE and engagement with regulators, SWS made several changes to the draft WRMP24 submitted in September 2023. These were as follows:

- the removal of options that are no longer required, or for clarity / consistency where bi-directional schemes are proposed;
- the addition of three new ‘resilience options’ comprising two new supply-side groundwater schemes and one new drought option;
- the inclusion of two WRMP19 options that were not explicitly noted previously;
- minor amendments to some supply-side network schemes (reflecting further engineering information);
- amendments to the first year and/or yield for some options;
- other minor amendments to reflect consultation responses.

These changes were considered through the SEA process and further assessments carried out where necessary, including for the resilience options, with the findings presented in a revised Environmental Report that accompanied the rdWRMP24 on consultation in 2024.

After careful consideration, taking into account consultation feedback, further evidence and discussion with regulators, SWS decided to withdraw Bulk import (HRZ): Sea Tankering (45Ml/d) from its WRMP24. This decision reflects SWS’s commitment to the communities it serves and the environment. During consultation on the rdWRMP24 significant concerns were raised by respondents about the potential impact of the option on the UK's fish farming industry, wild salmon populations and local aquatic life, due to the threat of *Gyrodactylus salaris* (Gs). Gs is classified as Non-Native Invasive Species and its introduction could have potentially significant ecological consequences.

Currently, there are no proven methodologies to guarantee that water transferred via sea tankering would be free of Gs. Recognising the severity of this risk, SWS accepts the possibility of introducing Gs poses an unacceptable risk. Furthermore, the logistical challenges associated with the option are significant. These include the procurement of services and obtaining planning permission for pipeline construction through environmentally sensitive areas. Given these challenges and the extended timelines required, which could potentially lead to considerable disruption, SWS decided it is prudent to consider more sustainable alternatives.

However recognising the potential of sea tankering as an emergency drought water supply option, SWS are committed to conducting further feasibility studies to mitigate risks associated with water transfer. These studies will help to inform WRMP29 and will consider whether sea tankering could be viable if the water was sourced from the UK.

1.5 Stages of Strategic Environmental Assessment

SEA comprises five key stages:

- **Stage A:** Scoping;
- **Stage B:** Develop and Refine Alternatives and Assess Effects;
- **Stage C:** Prepare Environmental Report;
- **Stage D:** Consult on the Draft Plan and Environmental Report and Prepare the Post Adoption (SEA) Statement; and
- **Stage E:** Monitor Environmental Effects.

Stage A of the SEA of the WRMP24 has been summarised in a scoping technical note. The scoping stage itself comprises five tasks that are listed below:

i. Review of other relevant policies, plans, programmes and strategies (hereafter referred to as 'plans and programmes').

ii. Collation and analysis of baseline information.

iii. Identification of key sustainability issues.

iv. Development of the assessment framework.

v. Consultation on the scope of the SEA (this Scoping Report).

The scoping technical note sets out the approach to assessing the likely significant environmental effects of the WRMP24 (and its iterations). It was issued for scoping consultation for 5 weeks from 21st February to 27th March 2022. The representations received and how they have been taken into account are presented in Appendix B Scoping Report Consultation Responses.

Following scoping consultation and amendment as appropriate, the framework has been used to assess the likely significant environmental effects (including cumulative effects) of the water resource options contained in the dWRMp24, the rdWRMP24 and the fdWRMP24 and any reasonable alternatives (**Stage B**). For the purposes of this SEA, the constrained options have been considered as reasonable alternatives to the preferred options (that comprise the Preferred Plan).

These assessments are presented in an Environmental Report (in a form to meet the requirements of Schedule 2 of the SEA Regulations) which has been completed to accompany each consultation version of the WRMP24 (the dWRMP24, the rdWRMp24 and the fdWRMP24) (**Stage C**).

An early regulator consultation on the draft SEA of the dWRMP24 was undertaken in June 2022. The representations received and how they have been taken into account are presented in Appendix C Environment Agency comments on June 2022 Environmental Report and Southern Water Responses.

The dWRMP24 and accompanying documents including the Environmental Report were submitted to Defra (formerly the Secretary of State for Environment, Food and Rural Affairs) for a request for publication. Following direction, Southern Water published the documents for consultation from November 2022 and February 2023 (**Stage D**). A summary of the representations received and how they have been taken into account are presented in Appendix D.

Following consultation, Southern Water prepared a Statement of Response to the representations received. It then completed further work reflecting revisions to the drought resilience and demand management expectations which led to amendments to the dWRMP24 and a rdWRMP24 was completed and given the changes, was also subject to further environmental assessment. The findings were presented in an accompanying Environmental Report and submitted to regulators in September 2023. The rdWRMP24 and accompanying documents including the Environmental Report were then submitted to Defra, for a request for publication. Following direction, Southern Water published the documents for consultation from 11th September to 4th December 2024. The consultation responses received and how they have been taken into account are presented in Appendix E.

Further changes to the rdWRMP24 were then made following further engagement with regulators and modelling carried out by WRSE. The fdWRMP24 and accompanying documents including the revised Environmental Report will be submitted to Defra for a request for publication and once directed to do so, Southern Water will publish the documents for consultation.

Taking into account the consultation responses received and any further work undertaken, a final WRMP24 will be sent to the Government, and if changes are likely to be significant, is likely to be subject to further assessment. The final WRMP24 will be sent to the Government, and following direction, the final WRMP24 will be published and implemented accordingly. In conjunction with publishing the final WRMP24, a post adoption statement will also be issued to meet the requirements of SEA regulation 16 (4). This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final plan.

The SEA requires monitoring of any resulting environmental effects of the WRMP24 (**Stage E**).

1.5.1 WRSE environmental assessment

Southern Water is developing its WRMP24 within the context of the WRSE Regional Plan[30,31]. The interactions and the need for consistency between the regional plans and the WRMPs, and between regions has driven development of new approaches and methodologies in the preparation of water resources plans. In this regard, WRSE commissioned the development of a new integrated environmental appraisal process to provide a consistent framework for environmental assessments for WRMP24. The method[32] has been developed taking into account the guidance from the EA and uses an integrated approach covering SEA, HRA, WFD assessment, Natural Capital Assessment (NCA) and Biodiversity Net Gain (BNG). A separate SEA Scoping Report[33] was published in September 2020. It was subject to consultation in 2020 and has been revised[34].

The revised environmental assessment methodology provides the approach to assessment for water companies when undertaking their WRMP24 regulatory environmental assessments. For the SEA, this includes the SEA Assessment framework used to undertake the assessment of the Southern Water dWRMP24, rdWRMP24 and fdWRMP24. Further work however has been identified and undertaken to

[30] WRSE (2022) Futureproofing our water supplies: A Consultation On Our Draft Regional Plan For South East England, November 2022. Available at: https://www.wrse.org.uk/media/va1bz21z/10306a_wrse-bv-plan-2022final_online.pdf

[31] WRSE (2023) Futureproofing our water supplies: Summary Of Our Revised Draft Plan For South East England https://www.wrse.org.uk/media/u0knltxt/wrse-regional-plan-summary-august-2023_final.pdf

[32] WRSE (2020) WRSE Method Statement: Environmental Assessment Consultation version July 2020. Available at: https://www.wrse.org.uk/media/wjig1mdu/wrse_file_1329_wrse-ms-environmental-assessment.pdf

[33] WRSE (2020) WRSE Regional Plan Strategic Environmental Assessment Scoping Report. Available at https://www.wrse.org.uk/media/51vdwyw0/wrse-regional-plan-strategic-environmental-assessment-scoping-report.pdf

[34] WRSE (2021) *Method Statement: Environmental Assessment Post-consultation version*, November 2021. Available at: https://www.wrse.org.uk/media/qmtb1e5v/method-statement-environmental-assessment-nov-2021.pdf

ensure the assessments reflect Southern Water requirements. This is also acknowledged in paragraph 1.36 of the post consultation environmental assessment method statement, which outlines specific actions to be undertaken by individual water companies when undertaking the assessments:

- "Collection, analysis and presentation of locally relevant plans and programmes to supplement the WRSE plans and programmes database.
- Collection, analysis and presentation of local baseline information to supplement the environmental datasets defined under the SEA topics.
- Identification, development and/or selection of local relevant assessment sub-objectives to provide a tailored assessment.
- Completion of an SEA for WRMP24."

In applying SEA to the Southern Water fdWRMP24, implementation has:

- Used the WRSE Regional Plan SEA Scoping Report[35] and consultation responses received as the basis of the proposed approach to assessment (including the relevant contextual information, the 14 assessment objectives and the assessment scoring criteria). This formed the basis of the revised approach to assessment contained in a Southern Water scoping technical note issued for separate scoping consultation for 5 weeks from 21st February to 27th March 2022. Consistent with paragraph 1.36 of the WRSE Method Statement, where relevant, the contextual information (including the review of plans and programmes and baseline information) has been revised to supplement the information already collated and presented.
- Further revised the approach to assessment of the revised preferred options, reflecting comments received on the dWRMP24 Environmental Report to ensure the consistent treatment of designated conservation, heritage and landscape sites and features within the assessment. These changes are summarised in Section **Error! Reference source not found.**.
- Used the further revised SEA assessment methodology to complete:
  - an assessment of the likely significant effects of the revised preferred options for each of Southern Water WRZs in deficit;
  - an assessment of the effects of the revised preferred programme of options and any identified alternative plan pathways;
  - an assessment of the cumulative effects with other infrastructure proposals or plans will be considered and assessed including, in particular, other water company WRMPs, the Regional Plan and SROs.
- Present the findings of the environmental assessment in an Environmental Report, consistent with the requirements of Schedule 2 of the SEA Regulations to accompany the draft (2023), revised draft (2024) and final draft (2025) WRMP24.

1.6 Consultation

1.6.1 Consultation on the scoping report

Consultation bodies, stakeholders and the public were invited to express their views on the proposed scope of the SEA in accordance with SEA Regulation 12(5). The scoping information was issued on 2nd February 2022 to the Environment Agency, Historic England and Natural England. The responses to comments provided on the updated scoping information and how these have been taken into account in carrying out the SEA are presented in Appendix B Scoping Report Consultation Responses.

[35] https://www.wrse.org.uk/media/51vdwyw0/wrse-regional-plan-strategic-environmental-assessment-scoping-report.pdf

1.6.2 Consultation on the environmental report

In June 2022 Southern Water submitted an early dWRMP24 submission to Defra as required by the WRMP Direction 2022. This was accompanied by an Environmental Report. This enabled Southern Water to take on board some early feedback which has influenced the development of the plan and accompanying assessments. The specific comments received from the Environment Agency on the draft Environmental Report (June 2022) are summarised in Appendix C Environment Agency comments on June 2022 Environmental Report and Southern Water Responses, along with details on how these have been addressed.

Southern Water consulted on the dWRMP24 and supporting technical documents (including the Environmental Report) between 14th November 2022 and 20th February 2023. Over 500 responses were received including a limited number (ten) on the Environmental Report. The comments received from consultees on the draft Environmental Report (October 2022) are set out in Appendix D Consultation Responses to the October 2022 Environmental Report and Southern Water Responses, along with information on how these have been addressed in this revised Environmental Report. Following consultation, Southern Water prepared a Statement of Response to the representations received.

Southern Water then completed further work reflecting revisions to the drought resilience and demand management expectations which led to amendments to the dWRMP24 and a rdWRMP24 was completed and given the changes, was also subject to further environmental assessment. The findings were presented in an accompanying Environmental Report and submitted to regulators in September 2023. The rdWRMP24 and accompanying documents including the Environmental Report were then submitted to Defra, for a request for publication. Following direction, Southern Water published the documents for consultation from 11th September to 4th December 2024. The consultation responses received and how they have been taken into account are presented in Appendix E. Southern Water has also prepared a Statement of Response to the representations received.

In response to the rdWRMP24 and associated environmental assessment reports published for consultation in November 2024, both the Environment Agency (EA) and Natural England (NE) requested further clarity on the Natural Capital (NC) and Biodiversity Net Gain (BNG) assessment work carried out for Southern Water options in support of the Regional Plan and rdWRMP24. To address these comments a separate BNG and NC Report has been produced and is presented in Appendix M of this Environmental Report.

1.7 Habitats Regulations Assessment

Regulations 63 and 64 of The Conservation of Habitats and Species Regulations (2017) (the 'Habitats Regulations') transpose the provisions of Articles 6(3) and 6(4) of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') as they relate to plans or projects in England and Wales. Regulation 63 states that if a plan or project is "(*a) is likely to have a significant effect on a European site*[36] *or a European offshore marine site*[37] *(either alone or in combination with other plans or projects); and (b) is not directly connected with or necessary to the management of the site*" then the competent authority must "…*make an appropriate assessment of the implications for the site in view of that site's conservation objectives*" before the giving consent or authorisation (etc.).

[36] Strictly, 'European sites' are: any Special Area of Conservation (SAC) from the point at which the European Commission and the UK Government agreed the site as a 'Site of Community Importance' (SCI) (if this was before 31 Jan 2020); any classified Special Protection Area (SPA); and any candidate SAC (cSAC). However, the term is also commonly used when referring to potential SPAs (pSPAs), to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') apply; and to possible SACs (pSACs) and listed Ramsar Sites. "European site" is therefore used in this proposal in its broadest sense, as an umbrella term for all of the above designated sites.

[37] 'European offshore marine sites' are defined by Regulation 18 of *The Conservation of Offshore Marine Habitats and Species Regulations 2017*; these regulations cover waters (and hence sites) over 12 nautical miles from the coast.

The plan or project can only be given effect if it can be concluded (following an 'appropriate assessment') that it *"…will not adversely affect the integrity*" of a site, unless the provisions of Regulation 64 are met.

The process by which Regulation 63 (and, if applicable, Regulation 64) is met is known as Habitats Regulation Assessment (HRA)[38]. An HRA determines whether there will be any 'likely significant effects' on any European site as a result of a plan's implementation (either on its own or 'in combination' with other plans or projects)[39] and, if so, whether there will be any 'adverse effects on site integrity'[40].

Water resource plans (whether WRMPs or Regional Plans) are not explicitly included within this legislation, although the regulator guidance[41] requires that it should extend to the WRMP if the preferred plan "*would be likely to have a significant effect on a European site (either alone or in combination with other plans or projects)*". The Habitats Regulations require every Competent Authority, in the exercise of any of its functions, to have regard to the requirements of the Habitats Directive. The water companies have a statutory duty to prepare WRMP24 and are therefore the Competent Authority for an HRA.

A HRA was undertaken for the dWRMP24 (2023) and rdWRMP24 (2024) and this has been updated for the fdWRMP24 to ensure that the preferred plan has been assessed in accordance with Regulation 63 of the Habitats Regulations. Whilst the HRAs has been undertaken and reported separately from the SEAs, its findings have been used as appropriate to inform the findings of this SEA, notably against the biodiversity, fauna and flora topic.

1.8 Water Framework Directive assessment

The Water Framework Directive[42] (WFD) has been enacted into UK legislation as the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 in England and Wales.

The WFD sets a default objective for all rivers, lakes, estuaries, groundwater and coastal water bodies to achieve 'good' status or potential by 2027 at the latest. The current (baseline) status (e.g., 2015 classification), and the measures required to achieve the 2027 status objective, are set out for each water body in the relevant River Basin Management Plans (RBMPs), prepared by the EA and NRW every six years. The current, updated RBMPs were published in October 2022.

In undertaking the WFD assessment of the WRMP24, Southern Water is seeking to demonstrate that the plan will not cause a deterioration in respect of these baseline conditions. Furthermore, for those water bodies that are not currently attaining good status, Southern Water must be able to confirm that WRMP24 would not preclude the delivery of measures to facilitate the improvements needed to attain good status. Where a plan is assessed as WFD non-compliant, in circumstances where there is an over-riding public interest or the benefits of achieving the WFD Assessment Objectives are outweighed by benefits to human health, human safety or sustainable development there is scope to apply for a Regulation 19 exemption as to why these WFD Assessment Objectives are not achieved.

A separate WFD assessment has been undertaken for the dWRMP24 (2023) and rdWRMP24 (2024) and this has been updated for the fdWRMP24 to provide the evidence base to respond to these requirements. The findings have been used to inform this SEA, notably against the water quality topic.

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[38] The term 'Appropriate Assessment' has been historically used to describe the process of assessment; however, the process is now more accurately termed 'HRA', with the term 'Appropriate Assessment' limited to the specific stage within the process.
[39] Also referred to as the 'test of significance'.

[40] Also referred to as the 'integrity test'.

[41] EA, Ofwat and NRW (2023) *Water Resource Planning Guidance* (WRPG) [online]. Available at: Water resources planning guideline - GOV.UK (www.gov.uk) [Accessed August 2023].

[42] European Union (2000) Directive 2000/60/EC of the European Parliament and of the Council.

1.9 Structure of this report

This SEA Environmental Report presents the findings of the assessment of the constrained, preferred options and programme of options that comprise the best value WRMP24**.** It provides the public, stakeholders and regulatory bodies with an opportunity to express their opinions on the findings of the assessment. The Environmental Report is structured as follows:

- Section 1 (this section): describes the requirement for, purpose and process of the SEA, and its context in relation to the WRMP24.
- Section 2 - Policy Context: identifies key messages and environmental protection objectives from other relevant plans and programmes.
- Section 3 - Environmental Baseline Review: draws out the key environmental issues Southern Water intends to consider in the SEA. Identifies the current and future baseline conditions within the area of potential influence of the WRMP24.
- Section 4 - Methodology: outlines the revised approach to the SEA of the revised draft WRMP including the scoping, timeframe and assessment framework comprising assessment objectives and guide questions, categorisation of effects including the cumulative effects and assessment of reasonable alternatives.
- Section 5 - Assessment of the fdWRMP24: presents the summary of the likely significant effects of the fdWRMP24 options, by WRZ against the SEA framework.
- Section 6 - Cumulative Effects Assessment: outlines the potential in-combination impacts of fdWRMP24 scheme options and other plans and projects in the region.
- Section 7 - Mitigation: discusses measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the fdWRMP24.
- Section 8 - Assessment of the Reasonable Alternatives to the fdWRMP24: outlines the selection of reasonable alternatives to the fdWRMP24 and summarises the effects of the alternatives considered.
- Section 9 - Next Steps and Proposals for Monitoring: outlines the next steps in the development of the fdWRMP24 and its assessment and outlines monitoring measures to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures.

The report also contains the following appendices:

- Appendix A: Quality Assurance Checklist.
- Appendix B: Scoping Report Consultation Reponses.
- Appendix C: Environment Agency Comments on June 2022 Environmental Report and Southern Water Response.
- Appendix D: Consultation Responses to the October 2022 Environmental Report and Southern Water Responses
- Appendix E: Consultation responses to the dWRMP24 (2023) and rdWRMP24 (2024) Environmental Reports and Southern Water Responses
- Appendix F: Review of Plans and Programmes.
- Appendix G: Environmental Baseline.
- Appendix H: Assessment Definitions of Significance.
- Appendix I: Constrained Options Assessment.

- Appendix J: Demand Management and Leakage Options Assessment.
- Appendix K: Revised Preferred Options Assessment.
- Appendix L: Summary of Post Mitigation Significant Effects by Water Resource Zone Options.
- Appendix M: Biodiversity Net Gain and Natural Capital Report.

2 Policy context

2.1 Introduction

The SEA Regulations require a report containing "an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes" (Schedule 2(1)) as well as "The environmental protection objectives, established at international (European) Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation" (Schedule 2(5)).

In accordance with the regulation, a review of relevant plans and programmes is presented in Section 2.

2.2 Review of policies, plans and programmes

2.2.1 Policies, plans and programmes reviewed

One of the first steps in undertaking SEA is to identify other relevant policies, plans, programmes and environmental protection objectives. The review of these other plans sets out to establish how Southern Water's fdWRMP24 might be affected by other plans, to identify other environmental and social objectives which the fdWRMP24 should consider and to help to identify the assessment objectives for the SEA.

Through updated work completed for WRSE environmental assessment, potentially relevant plans and programmes were identified at the international, national, regional and local level. If the plan or programme was assessed as not having a significant effect on the objectives of the fdWRMP24 and/or the fdWRMP24 does not have a significant effect on achieving the objectives of the other plan or programme, it was not reviewed in detail.

The full list of international, national, regional and local policies, plans, programmes and strategies reviewed and the key policy objectives, targets and how they relate to SEA topics and SEA objectives are provided in Appendix F Review of Plans, Policies and Programmes and listed in Table 2-1.

Table 2-1 Key policy objectives derived from the review of plans, policies and programmes.

International/European	
• Ramsar Convention - The Convention on Wetlands of International Importance (1971) • UNESCO (1972) Convention Concerning the Protection of the World Cultural and Natural Heritage • Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979) • Directive on the Conservation of Wild Birds (79/409/EEC) (as amended) • Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983) • The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention) (1985) • Charter for the Protection and Management of Archaeological Heritage (1990) • The Nitrates Directive (91/676/EEC) • Urban Wastewater Treatment Directive (91/271/EEC) • Convention on Biological Diversity (1992)	• European Commission Environmental Liability Directive (2004/35/EC) • Thematic Strategy on Air Pollution (2005) • Directive on Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC) • Fresh Water Fish Directive (2006/44/EC) • Groundwater Directive (2006/118/EC) • The European Landscape Convention (2006) • Thematic Strategy for Soil Protection (2006) • Directive on the Assessment and Management of Flood Risks (2007/60/EC) • Establishing measures for the recovery of the stock of European eel 2007 (1100/2007) • Limiting Global Climate Change to 2 degrees Celsius - The way ahead for 2020 and beyond (2007) • Ambient Air Quality Directive (2008/50/EC) • Marine Strategy Framework Directive (2008/56/EEC)

• Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC) • European Commission (1992) The Habitats Directive 1992/43/EEC • The European Convention on the Protection of Archaeological Heritage (Valletta Convention) (1992) • Kyoto Protocol to the UN Framework Convention on Climate Change (1997) • Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) (1998) • Drinking Water Directive (1998/83/EC) • The Water Framework Directive (WFD) (2000/60/EC) • The SEA Directive (Directive 2001/42/EC) • Commitments arising from the World Summit on Sustainable Development, Johannesburg (2002) • The Environmental Noise Directive (2002/49/EC) European Soils Charter (2003)	• Promotion of the use of energy and renewable sources Directive (2009/28/EC) • Defra (2011) Mainstreaming Sustainable Development • European Commission (2011) The EU Biodiversity Strategy to 2020 • United Nations Framework Convention on Climate Change (UNFCCC) (2011) The Cancun Agreements • Blueprint to Safeguard Europe's Water Resources (2012) • Energy Act 2013 • Directive on Bathing Water (76/160/EEC); and Directive 2006/7/EC repealing Directive 76/160/EEC (from 2014) • Paris Agreement (2015) • A Clean Planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy (2018) The Water Resources Planning Guideline (2021)
National	
• National Parks and Access to the Countryside Act 1949 • Salmon and Freshwater Fisheries Act 1975 • The Ancient Monuments and Archaeological Areas Act 1979 • The Wildlife and Countryside Act 1981 (as amended) • Environmental Protection Act 1990 • Planning (Listed Buildings and Conservation Areas) Act 1990 • Water Industry Act 1991 • Water Resources Act 1991 • Environment Act 1995 • Countryside and Rights of Way (CROW) Act 2000 • Water Act 2003 (as amended) • Environmental Assessment of Plans and Programmes Regulations 2004 • Securing the Future - Delivering the UK Sustainable Development Strategy (2005) • The Natural Environment and Rural Communities Act 2006 (NERC Act) • The Water Resources Management Plan Regulations 2007 • Climate Change Act 2008 • Climate Change and the Historic Environment, English Heritage (2008) • Planning Act 2008 • Marine and Coastal Access Act (2009) • Safeguarding our Soils - A strategy for England, Defra (2009) • The Eels (England & Wales) Regulations 2009 (as amended) • Delivering a healthy natural environment. Ecosystem approach action plan, Defra (2010)	• Conservation 21 - Natural England's Conservation Strategy for the 21st Century, Natural England (2016) • Managing Water Abstraction, Environment Agency (2013) • Historic England (2015) The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning 3 • National Infrastructure Delivery Plan 2016-2021, Infrastructure and Projects Authority (HM Government) (2016) • Standing Advice on Protected Species, Natural England (2016) • Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment, Historic Environment (2016) • Water Resources Planning Framework (2015-2065), Water UK (2016) • Groundwater protection technical guidance, Environment Agency (2017) • Protect groundwater and prevent groundwater pollution, Environment Agency (2017) • The Conservation of Habitats and Species Regulations (2017) (as amended) • The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended) • UK Climate Change Risk Assessment, Defra (2017) • A Green Future: Our 25 Year Plan to Improve the Environment, UK Government (2018) • Creating a better place: Our ambition to 2020, Environment Agency (2018) • Defra and The Environment Agency (2018) Resources and waste strategy for England

• Flood and Water Management Act 2010 • Making Space for Nature - A review of England's Wildlife Sites and Ecological Network (2010) • Biodiversity 2020: A strategy for England's wildlife and ecosystem services, Defra (2011) • The Natural Choice: Securing the Value of Nature, Defra (2011) • Water for Life White Paper, Defra (2011) • UK Marine Policy Statement (2011) • National Policy Statement for Wastewater (2012) • UK Post-2010 Biodiversity Framework, Joint Nature Conservation Committee (JNCC) and Defra (2012) • Climate change approaches in water resources planning - Overview of new methods, Environment Agency (2013) • Ancient Woodland and Veteran Trees: Protecting them from development, Forestry Commission and Natural England (2014) • UK National Ecosystem Assessment Follow-on (2014) • Fixing the foundations: Creating a more prosperous nation, HM Government (2015) • The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 • The Great Britain Invasive Non-Native Species Strategy, Defra (2015) • A narrative for conserving freshwater and wetland habitats in England, Natural England (2016)	• Draft National Policy Statement for Water Resources Infrastructure, Defra (2018) • Environment Agency and Natural Resources Wales (2018) Water Resources Planning Guideline: Interim update • HM Government (2018) The Water Supply (Water Quality) Regulations 2018 • Preparing for a drier future: England's water infrastructure needs, National Infrastructure Commission (2018) • The Environment Agency's approach to groundwater protection, Environment Agency (2018) • The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting, Defra (2018) • The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019) • The Invasive Alien Species (Enforcement and Permitting) Order 2019 • Meeting our future water needs: a national framework for water resources, Environment Agency (2020) • National Flood and Coastal Erosion Risk Management Strategy for England, Environment Agency (2020) • State of Natural Capital Annual Report 2020, Natural Capital Committee (2020) • National Planning Policy Framework (NPPF) (2024) • Marine Plans - South East Inshore, South Inshore, South Offshore (to be published 2021) • The Environment Act 2021 • Water Resources Planning Guideline and Technical Supplementary Guidance, Environment Agency, OfWAT and Natural Resources Wales (2023)
Regional/Local	
• Chichester Harbour AONB Management Plan 2019-2024 (Chichester Harbour Conservancy) • Chiltern Hills AONB Management Plan 2014-2019 • Cotswolds AONB Management Plan 2013-2018 • Cranborne Chase AONB Management Plan 2019-2024 • Dorset AONB - A Framework for the Future AONB Management Plan 2019 - 2024 • Drought Plans from adjacent water companies • Environment Agency Catchment Abstraction Management Strategies (CAMS) • Green infrastructure plans • Isle of Wight AONB Management Plan 2014 - 2019 (Wight AONB Partnership) • Kent Downs AONB Management Plan 2014-2019 • Partnership Plan for the New Forest National Park 2021-2026 • Public Rights of Way Improvement Plans (ROWIP)	• South East Biodiversity Strategy (2009), South East England Biodiversity Forum Environment Agency (2010), Water Resources Strategy - A Regional Action Plan for Thames Region • Defra (2010), Eel Management plans for the United Kingdom South East River Basin District and Implementation of UK Eel Management Plans (2017-2020) • Environment Agency (2011), Water Resources Strategy - A Regional Action Plan for Thames Region • Environment Agency, The Wild Trout Trust and the Atlantic Salmon Trust South Coast Sea Trout Action Plan (2011) • Mayor of London (2011), Securing London's Water Future The Mayor's Water Strategy • South Downs National Park (2013), Partnership Management Plan, Shaping the future of your south downs national park 2014-2019

- RSPB Pagham Harbour Local Nature Reserve Management Plan 2013-2018
- Surrey Hills AONB Management Plan 2020-2025
- Surrey Wildlife Trust 5-year Plan 2018-2023
- The High Weald AONB Management Plan 2019-2024
- The North Wessex Downs AONB Management Plan 2014-19
- Water Resources in the South East (WRSE) Group (forthcoming) regional water resources strategy
- West Sussex County Council (2005), A Strategy for the West Sussex Landscape
- Environment Agency (2007), Water for the Future - Managing Water in the South East of England
- Environment Agency (2009), Water Resources Strategy. Regional Action Plan for Southern Region
- Environment Agency (2015), South West River Basin District, River basin management plan
- Environment Agency and Defra (2015), South East River Basin District River Basin Management Plan
- Environment Agency (2016), South East River Basin District Flood Risk Management Plan 2015 - 2021
- Environment Agency (2016), South West River Basin district Flood Risk Management Plan
- Environment Agency and Defra (2016), Thames River Basin District River Basin Management Plan
- Port of London Authority (2016) The Vision for the Tidal Thames
- Southern Water Business Plan 2020-25 (2019)Southern Water Environment Policy (2019)
- Southern Water WRMP (2019)
- Southern Water WRMP19 2020-2070 (2019)
- Water Resources Management Plans from adjacent water companies (2019)

2.2.2 Identification of key themes

The main themes, messages and objectives from the policies, plans and programmes review that are considered relevant to the fdWRMP24 are as follows:

- Conserve flora and fauna and their habitats;
- Conservation and wise use of wetlands and their resources;
- Protection of wild birds and their habitats;
- Halt overall biodiversity loss;
- Creation of green infrastructure;[43]
- Protection of landscape character and quality;
- Improve water quality so all waters achieve ‘good status’ as set out in the Water Framework Directive;
- Prevent or limit inputs of pollutants into groundwater;
- Monitor and provide information to consumers on drinking water quality;
- Promote efficient use of water;
- Reduce and manage the risks of flooding;
- Reduce greenhouse gas emissions;
- Adapt to the impacts of climate change;

[43] The European Commission defines green infrastructure as a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation. This network of green (land) and blue (water) spaces can improve environmental conditions and therefore citizens' health and quality of life. It also supports a green economy, creates job opportunities and enhances biodiversity. The Natura 2000 network constitutes the backbone of the EU green infrastructure. Available at: http://ec.europa.eu/environment/nature/ecosystems/index_en.htm

- Increase resource efficiency and reduce natural resource use and waste;
- Create a green economy and promote sustainable growth;
- Promote sustainable and healthy communities;[44]
- Promote social inclusion and community participation;
- Carbon sequestration with the aim of net zero carbon emissions by 2050 as per Paris Climate Agreement (and legislation passed by UK govt. in 2018);
- Habitat creation and safeguarding ecosystem services (Woodland Carbon Guarantee scheme in line with the Woodland Carbon Fund);
- Catchment management / nature-based solutions working to enhance natural processes (existing work through a Catchment Based Approach (CaBA));
- Reduce water waste and leakage (Ofwat targets and penalties);
- Improve resilience to extreme droughts ensuring consistency with WRMP24 (1/500 year resilience);
- Protect cultural heritage assets including archaeological remains and built heritage;
- Protect best quality soils and agricultural land.
- Support the Lawton recommendation[45] for statutory undertakers planning the management of water resources to:
  - Make space for water and wildlife along rivers and around wetlands
  - Restore natural processes in river catchments, including in ways that support climate change adaptation and mitigation;
  - Accelerate the programme to reduce nutrient overload, particularly from diffuse pollution.
- Support the UK Government's 25 Year Plan to Improve the Environment: [46]
  - Using and managing land sustainably - including embedding an "environmental net gain" principle into development (as reflected in the Environment Act 2021[47]);
  - Recovering nature and enhancing the beauty of landscapes;
  - Connecting people to the environment to improve health and wellbeing;
  - Increase resource efficiency and reducing pollution;
  - Securing clean, healthy and productive and biologically diverse seas and oceans;
  - Protecting and improving the global environment.

The themes, messages and objectives identified from the policies, plans, and programmes review have been used to identify key issues and opportunities and develop the SEA Framework.

[44] The UK Government definition of sustainable communities as outlined in the document 'Sustainable Communities: Homes for All' (ODPM, January 2005, page 74) is: "*Sustainable communities are places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all*". Available at: https://webarchive.nationalarchives.gov.uk/20120920061353/http://www.communities.gov.uk/documents/corporate/pdf/homes-for-all.pdf

[45] Lawton (2010) *Making Space for Nature* (Recommendation 4, Page 73). Available at: https://www.gov.uk/government/news/making-space-for-nature-a-review-of-englands-wildlife-sites-published-today

[46] UK Government (2018) *A Green Future: Our 25 Year Plan to Improve the Environment*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

[47] UK Government (2021). Environment Act 2021. Available at: https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted

3 Environmental baseline review

3.1 Introduction

The SEA Regulations require a report containing 'The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme' (Schedule 2(2)), 'The environmental characteristics of areas likely to be significantly affected' (Schedule 2(3)), and 'Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as are pursuant to Council Directive 79/409/EEC on the conservation of wild birds(1) and the Habitats Directive' (Schedule 2(4))'.In this context, an essential part of the SEA process is the identification of the current baseline conditions and their likely evolution. Only with a knowledge of existing conditions, and a consideration of their likely evolution, can the effects of the fdWRMP24 be identified and appraised and its subsequent success or otherwise be monitored. This is also useful in determining the key issues for each topic that should be taken forward in the SEA, through the SEA objectives and guide questions.

Full environmental baseline data are presented in Appendix G Environmental Baseline and have been drawn from a variety of sources, including a number of the plans and programmes reviewed as part of the SEA process (as set out above in Table 2-1). This environmental baseline review also summarises the likely future trends for the environmental issues being considered (as far as information is available). The key issues arising from the review of baseline conditions are summarised in **Section 3.2**.

3.2 Key issues and opportunities

Table 3-1 Key issues and opportunities.

SEA topic	Scoped in	Implications	Opportunities
Biodiversity, flora and fauna	Yes	The WRMP24 area is rich in habitats and species diversity, and includes national and internationally designated sites including SSSIs, SPAs, SACs, Ramsar sites and MPAs/MCZs. Development of new water infrastructure can directly or indirectly affect designated and non-designated sites, habitats and species through loss of land, disturbance and damage. There is potential for the options within the WRMP24 to result in surface and/or groundwater pollution which could have an impact on wildlife. Wetland and marsh habitat rely on water, the WRMP24 should ensure that it does not affect these areas through over abstraction and should look for opportunities to reduce abstraction pressure where possible. Best value outcomes can be identified through combining nature-based solutions work with abstraction reduction scenarios. WRMP24 policies should be more clearly aligned to the 25 Year Environment Plan, including commitments on how the WRMP24 can contribute to the 25 Year Environment Plan policies.	The key sustainability issues arising from the baseline assessment for biodiversity are: • The need to protect or enhance and support the achievement of favourable condition and conservation status for the WRMP24 area's biodiversity, particularly within designated sites, species and habitats of principal importance, informed by the evidence base. • The need to consider the implications of effluent re-treatment options on existing discharges from wastewater treatment works and the consequences for nutrients within receiving waters. • The need to achieve nutrient neutrality, taking into account Natural England's advice. • The need to avoid activities likely to cause irreversible damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors and habitat patches or stepping stones. • The need to take opportunities to deliver biodiversity net gains. • The need to control the spread of Invasive Non-Native Species (INNS). • The need to recognise the importance of building wildlife's resilience to, and allowing wildlife to adapt to climate change. • The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.
Water	Yes	Phosphate and physical modifications are the most common pressures affecting the achievement of 'Good' status. The significant water management issues which are most common in affecting the achievement of 'Good' are pollution from wastewater, physical modifications and pollution from town, cities or rural areas. There is potential for	The key issues arising from the baseline assessment for water are: • The need to further improve the quality of the regions river, estuarine, wetlands and coastal waters taking into account WFD objectives. • The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives. • The need to improve the resilience, flexibility and sustainability of water resources in the WRMP24 area, particularly in light of

SEA topic	Scoped in	Implications	Opportunities
		the options within the WRMP24 to have a negative impact on water quality. Areas of the WRMP24 area are at high risk of flooding from both surface water and rivers and the sea. There is potential that the options within the WRMP24 could be affected by or contribute to an increased risk of flooding.	potential climate change impacts on surface water and groundwaters. • The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply. • The need to ensure that people understand the value of water. • The need to avoid inappropriate development in areas at risk of flooding. • The need for resilience to the potential effects on flood risk caused by climate change.
Soil	Yes	Agriculture has a dominant role in the landscape of the WRMP24 area. Agricultural land of Grades 2 and 3 is the most common. The options within the WRMP24 have the potential to result in a loss of agricultural land or through a reduction in water availability for agricultural processes. There is also potential for soil contamination through the construction phase.	The key sustainability issues arising from the baseline assessment for soil, geology and land use are: • The need to protect and enhance geological features of importance (including geological SSSIs). • The need to maintain and enhance soil function and health, including its role as a carbon sink, and relationship with water quality and flooding. • The need to sustainably manage the land and soil more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources and best and most versatile soils). • The need for effective use of land, including reuse of previously developed land where appropriate.
Air	Yes	Air quality in the region is varied. Generally, it is good, however there are some areas designated as AQMAs. Air pollution sources include transport and industry. The options within the WRMP24 have the potential to impact air quality. This could include the generation of air pollutants from treatment plants and there is also likely to be effects from the construction phase.	The key sustainability issues arising from the baseline assessment for air are: • The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.
Climatic factors	Yes	The WRMP24 area is projected to have hotter and drier summers, and wetter and warmer winters, as well as short duration "extreme weather events" such as thunderstorms and heatwaves. There is potential that this could affect water availability through increases in periods of drought.	The key sustainability issues arising from the baseline assessment for climatic factors are: • The need to reduce greenhouse gas emissions (industrial processes and transport). • The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use

SEA topic	Scoped in	Implications	Opportunities
		There is also potential for options within the WRMP24 to result in carbon emissions during the construction and operation phase which will further contribute to climate change. Increased demand due to extreme events (i.e. heatwaves). Greater risks to rapid responding catchments (i.e. North Sussex clay catchments).	efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities afforded by climate change.
Population, communities and human health	Yes	Population is expected to grow which will likely place additional pressure on the water environment within the WRMP24 area. Economic growth and climate change will also add to this pressure. Health is generally good. The options within the WRMP24 have the potential to result in temporary disturbance effects during the construction phase. There is also potential for impacts on the water or natural environment which could have impacts on recreation and wellbeing.	The key sustainability issues arising from the baseline assessment for population and human health are: • The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water for health and wellbeing. • The need to ensure water supplies contribute to improvements in levels of health, particularly in urban areas and deprived areas. • The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other use such as agriculture. • The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment. • The need to accommodate an increasing population and housing growth through provision of essential services including water supply. • Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and wellbeing and the economy. • The need to reduce the risk of harm from environmental hazards, such as flooding and drought.
Historic environment	Yes	The WRMP24 area is rich in heritage and contains many listed buildings, conservation areas, scheduled monuments, and registered parks and gardens, amongst others.	The key sustainability issues arising from the baseline assessment for archaeology and cultural heritage are: • The need to conserve or enhance sites of archaeological importance and cultural heritage interest, particularly those which are sensitive to the water environment.

SEA topic	Scoped in	Implications	Opportunities
		The options within the WRMP24 have the potential to directly or indirect impact the historic environment through effecting the asset's fabric or setting.	• The need to protect water-dependent heritage sites during drought and flood conditions.
Landscape	Yes	The WRMP24 area's landscape is diverse and there are important landscapes within the region, including two National Parks and eight National Landscapes. There is potential for the options within the WRMP24 to have an impact on the landscape. This could include temporary construction effects and permanent effects associated with infrastructure which could affect visual amenity or the character of the area.	The key sustainability issues arising from the baseline assessment for landscape and visual amenity are: • The need to protect and improve the natural beauty of the area's National Landscapes, National Parks and other areas of natural beauty. • The need to protect and improve the character of landscapes and townscapes.
Material Assets	Yes	The WRMP24 area contains important transport links which could be affected during construction works. There is also significant water and wastewater treatment infrastructure across the WRMP24 area. The WRMP24 area also produces and manages a significant amount of waste. The WRMP24 has the potential to increase the use of resources and result in the generation of waste.	The key sustainability issues arising from the baseline assessment for material assets and resource use are: • The need to minimise the consumption of resources, including water and energy. • The need to reduce the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill, in accordance with the waste hierarchy. • The need to continue to reduce leakage from the water supply system to help reduce demand for water. • Daily consumption of water is relatively high and consequently there is a continued need to encourage more efficient water use by consumers. • The need to treat water and waste in ways that sustain the environment and enable the economy to prosper.

3.3 Limitations of the data and assumptions made

The area under consideration for the SEA is relatively large and covers a number of different geographical and political regions, which makes establishing a baseline at the sub-regional level challenging. There are also challenges around extrapolating information from data collated at differing spatial resolutions. Spatial data have been obtained wherever possible in relation to the SEA topics and the baseline is presented graphically as mapped information where appropriate (see Appendix G Environmental Baseline). In some instances, reporting cycles mean that available information is dated.

The data gathered to complete the baseline includes information that is affected by the Covid-19 pandemic and its environmental, social and economic effects. Data that relates to these changes is only becoming available periodically and it may well be a number of years before the effects of the crisis can be determined, along with whether changes to the topics covered in the baseline have been short-term or sustained. This is an additional uncertainty that will need to be identified within the subsequent assessment, and where appropriate, some qualitative commentary may be provided regarding the evolution of the baseline.

The assessments presented in Section 5 and 6 include consideration of the uncertainty and limitations of the available data and comments are provided as to any underpinning assumptions made where data are lacking or dated.

3.4 Inter-relationships

It is noted that there are inter-relationships between SEA topics. These include impacts of changes to water flows and quality on biodiversity, the economy, recreation, tourism, navigation, cultural heritage and landscape. Inter-relationships that result in changes to individual effects are considered by evaluation of synergistic effects throughout the assessment.

4 Methodology

4.1 Overview

This section describes the approach to the assessment of Southern Water's fdWRMP24. It draws on the information contained in Sections 2 and 3, to define the scope of the assessment (in terms of the environmental and socio-economic issues to be considered) and sets out the SEA objectives and guide questions that comprise the assessment framework. The section then outlines how this assessment framework will be used to assess the options contained in the fdWRMP24.

4.2 Scope of the assessment

4.2.1 Topics

The aim of SEA is to identify, describe and evaluate the likely significant effects of implementing the fdWRMP24 on the environment. Schedule 2 of the SEA Regulations require that the assessment includes information on the "*likely significant effects on the environment, including on issues such as: biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage, including architectural and archaeological heritage; landscape; and the inter-relationship between the issues referred to*".

The key policy objectives identified from the review of other plans and programmes relevant to the assessment of the fdWRMP24 (Section 2) and the economic, social and environmental issues arising from the analysis of the baseline (Section 3), together with the characteristics of the water resource management options, have been used to define the scope of the assessment in terms of the topics set out in Schedule 2 of the SEA Regulations.

In this instance, all SEA topics identified by Schedule 2 of the SEA Regulations have been scoped in for assessment to provide a comprehensive basis to identify, describe and evaluate the likely significant effects arising from the construction and operation of the water resource management options reflecting the wide ranging nature of the plan and baseline evidence and key issues identified.

4.2.2 Geographic scope

The geographic extent of each SEA will reflect the operational area covered by Southern Water's WRMP24.

Where water resource options include transfers and potential water trading options between companies, where appropriate further consideration has been given to the effects outside the operational area of Southern Water's WRMP24. This also extends to the assessment of cumulative effects, where consideration of plans or programmes that cover areas that either overlap or are adjacent to the plan being assessed are also taken into account e.g. other water company WRMP24s and the WRSE Regional Plan.

4.2.3 Timescales

When considering the timing of potential effects of the fdWRMP24, the assessment has classified effects as 'short,' 'medium' or 'long-term.' This reflects an intention to capture the differences that could arise at different timescales, consistent with the requirements of Schedule 1 (2)(a) of the SEA Regulations where the assessment of the effects should have regard to "*the probability, duration, frequency and reversibility of the effects*".

Table 4-1 below summarises the timescales applied in the SEA informed by the 5-year cycle of review of the plan. For the purposes of this assessment, short-term will be considered as up to 1 year, medium-term (from

1 year to 5 years (to the end of the plan review cycle)) and long-term for the period beyond 5 years (i.e. beyond the plan review (5 year AMP) cycle).

Table 4-1 Duration of short, medium and long term.

Estimated length (years)	Duration
0-1 years	Short
>1-5 years	Medium
Over 5 years	Long

4.2.4 Consultation on the scope

Consultation bodies, stakeholders and the public were invited to express their views on the proposed scope of the SEA in accordance with SEA Regulation 12(5). The scoping information was issued on 2nd February 2022 to the Environment Agency, Historic England and Natural England. The responses to comments provided on the updated scoping information and how these have been taken into account in carrying out the SEA are presented in **Appendix B** Scoping Report Consultation Responses.

4.3 The SEA framework

Establishing appropriate SEA objectives and guide questions is central to assessing the effects of the fdWRMP24 on the environment. Each of the constrained water resource management options and revised preferred options has been assessed against the SEA objectives to determine the scale and significance of the effect. Guide questions focus the assessment on specific aspects of the objective that reflect issues identified from the review of baseline and contextual information relating to Southern Water's WRMP24 area.

The SEA objectives and assessment questions used to undertake the assessment is shown in Table 4-2. It reflects the SEA assessment framework developed by WRSE[48,49] (to ensure alignment of assessments across the region) and is based on an analysis of the baseline information, review of plans and programmes and regulator feedback.

Table 4-2 SEA objectives and assessment questions.

SEA topic	SEA objective	Assessment questions
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	• Is the option likely to affect the conservation status of any SPA, SACs, Ramsar sites and MCZ, undermine or prevent restoration of SSSI condition or affect the condition of locally designated sites? • Will the option protect and enhance aquatic and habitats and species, including freshwater fisheries and chalk rivers? • Will the option affect the marine environment, habitats and species (including MCZs and MPAs)? • Is the option likely to affect ancient woodland, priority habitat or species?

[48] WRSE (2020) *WRSE Method Statement: Environmental Assessment Consultation version July 2020*. Available at: wrse_file_1329_wrse-ms-environmental-assessment.pdf

[49] WRSE (2021) *Method Statement: Environmental Assessment Post-consultation version*, November 2021. Available at: methodstatement-environmental-assessment-nov-2021.pdf (wrse.org.uk)

SEA topic	SEA objective	Assessment questions
		• Will the option affect any habitats that support legally protected species or species of conservation concern? • Is there potential for contribution to achieving 'favourable' conservation status or for creation of new habitats and species "of principal importance for the purpose of conserving biodiversity" covered under Section 41 (England) of the NERC Act (2006)? • Is the option likely to have an impact on a current or future Nature Recovery Network? • Are there any opportunities for habitat creation or restoration? • Will the option contribute to the loss or gain in habitat connectivity? • Is there a possibility for INNS to be spread/ introduced or for algal blooms to occur? • Is there an opportunity to improve biodiversity value through removal of INNS? • Does the option enable or reduce the potential of water dependent wildlife to adapt to climate change?
Soil	Protect and enhance the functionality, quantity and quality of soils	• Will the option affect high grade agricultural land? • Will the option promote the efficient use of land? • Will the option prevent soil erosion and retain soil stocks as a natural resource? • Will the option promote soil health? • Will the option involve use of brownfield or greenfield land? • Will the option prevent mineral sterilisation? • Will the option affect soil contamination or involve remediation? • Is the option likely to affect geodiversity, including SSSIs of geological importance? • Will the option promote the sustainable use of land? • Will the option prevent nutrient loading in water bodies?
Water	Increase resilience and reduce flood risk	• Is the option vulnerable to flood risk? • Will the option contribute to the risk of flooding? • Will the option mitigate flood risk? (i.e. attenuation of flows through (Natural Flood Management (NFM), catchment storage etc.)
	Protect and enhance the quality of the water environment and water resources	• Will the option affect surface water quality or quantity? • Will the option affect ground water quality or quantity?

SEA topic	SEA objective	Assessment questions
		• Is the option likely to contribute to or conflict with the achievement of WFD objectives? • Will the option affect bathing waters? • Will the option affect shellfish water protected areas? • Will the option affect chalk rivers? • Will the option affect raw water quality? • Will the option reduce the flashy nature of surface waters? • Will the option slow the flow in upper catchments and reduce soil losses to river systems? • Will the option comply with flow targets (i.e. EFI, CSMG)? • Will the option provide a water environment more resilient to drought or prolonged dry weather?
	Deliver reliable and resilient water supplies	• Does the option provide a reliable and sustainable water supply which meets changing demand? • Will the option protect and enhance the environmental resilience of the water environment to climate change, flood risk and drought? • Does the option reduce the presence of containments in waterbodies, and make more water available to the environment?
Air	Reduce and minimise air emissions	• Is the option in an air quality management area (AQMA)? • Will the option affect local air quality?
Climatic factors	Reduce embodied and operational carbon emissions	• Will the option affect carbon or other greenhouse gas (GHG) emissions? • Is there potential for the option to incorporate climate mitigation measures to reduce its carbon footprint, such as lower embodied carbon or incorporating renewable energy? • Will the option affect carbon sequestration?
	Reduce vulnerability to climate change risks and hazards	• Is the option vulnerable to climate change effects? • Does the option include climate resilience measures? • Will the option create catchment resilience to drought?
Landscape	Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	• Will the option have an effect on the character of the landscape, townscape or seascape, including tranquillity and views? • Will the option improve access to the countryside? • Will the option create or improve green infrastructure which contributes to access to the landscape?

SEA topic	SEA objective	Assessment questions
		• Will the option protect and enhance designated landscapes and features?
Historic environment	Conserve, protect and enhance the historic environment, including archaeological remains	• Will the option affect designated or non-designated heritage assets, sites and features? • Will the option affect the setting and/or significance of an heritage asset? • Will the option affect archaeological remains (including unknown archaeological remains)? • Will the option affect heritage assets at risk? • Will the option affect conservation areas or historic landscape/townscape areas?
Population and human health	Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	• Does the option promote water efficiency and encourage a reduction in water consumption? • Will the option secure resilient water supplies for the health and wellbeing of customers? • Will the option allow for economic development? • Will the option allow for economic diversity? • Will the option have an effect on active lifestyles, such as impacts on active travel through disruption to pedestrian and cycle routes? • Will the option affect Public Rights of Way? • Will the option affect road or rail infrastructure? • Will the option minimise disturbance from noise, light, visual, and transport? • Will the local communities have been actively engaged to foster an inclusive environment and participate in decision making?
	Maintain and enhance tourism and recreation	• Will the option maintain or enhance tourism? • Does the option improve access to the natural environment for recreation, including those living within deprived areas? • Will the option have an effect on freshwater fisheries for recreational purposes? • Will the option have an effect on marine fisheries for recreational purposes?
Material assets	Minimise resource use and waste production	• Will the option reuse existing infrastructure? • Will the option minimise the use of resources? • Will the option reduce the production of waste?
	Avoid negative effects on built assets and infrastructure	• Will the option affect built assets and infrastructure, including transport infrastructure?

4.4 Undertaking the assessment

4.4.1 Option assessment

Both the construction and operational effects of all the constrained options (for the draft, rdWRMP24 and fdWRMP24) and the draft, revised draft and final draft preferred options have been assessed against all of the SEA objectives that comprise the assessment framework. This approach ensures a comprehensive consideration of any likely effects. It also recognises that the environmental effects are likely to be different in their nature, scale and significance during construction as opposed to their operation. For those options that would not require construction works *per se* and may be ongoing in nature (for example, the installation of water efficient devices, audits and educational programmes), construction in the context of the SEA refers to any enabling/installation works or option implementation.

GIS shapefiles for the water resource options have been uploaded onto a web-based GIS tool, which has then used to identify proximities to a range of environmental constraints and to interrogate the environmental data to identify likely effects and opportunities for each constrained option. This has included consideration of the following *inter alia*:

- Biodiversity, flora and fauna: Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites, Sites of Special Scientific Interest (SSSIs) and Local Nature Reserves (LNRs);
- Soil: Agricultural Land Classifications (ALC), historic landfill sites;
- Air: Air Quality Management Areas (AQMA);
- Flood risk: Flood zone 2 and 3;
- Water: Source Protection Zones (SPZs) and Nitrate Vulnerable Zones (NVZs);
- Landscape: National Parks and National Landscapes;
- Historic Environment: World Heritage Sites (WHS), Schedule Monument (SMs), Registered Parks and Gardens and Registered Battlefields.

Using the assessment framework, the GIS mapping, in determining the effects, consideration has been given to the following:

- the nature of the potential effect (what is expected to happen);
- the timing and duration of the potential effect (e.g., short, medium or long term);
- the geographic scale of the potential effect (e.g., local, regional, national);
- the location of the potential effect (e.g., whether it affects rural or urban communities, or those in particular parts of a water company area); and
- the potential effect on vulnerable communities or sensitive sites.

Professional judgement was applied to score the option using the guidance in **Appendix H** Assessment Definitions of Significance.

An option may have both positive and negative effects under a SEA objective. Rather than trading these effects to cancel each other out, both positive and negative scoring was used to show there are potential mixed effects. The results of the HRA and WFD assessments fed into the SEA objectives on biodiversity and water topics.

The assessment matrix set out in Table 4-3 has been used to assess each of the constrained and preferred options against the SEA objectives. The outcomes of the assessment have been used to inform the development of the fdWRMP24.

The first and second columns set out the SEA topics and objectives. The third, fourth and fifth columns provides the scoring (see Table 4-4) and commentary of the impact of each option on the objectives for each topic, with reference to the key questions set out above in Table 4-2. The assessment assumes the implementation of standard industry best practice methods in implementing the measures as well as any defined mitigation measures (which are set out in the commentary) such that the significance of effects relates to the residual effects after the application of any mitigation measures in line with the Government[50] and industry[51] guidance. Following proposed mitigation (if required) set out in the sixth column of Table 4-3, residual construction and operation effects are recorded in the seventh and eight columns. The scoring is used for the assessment of the likely significant effects of each option.

Where qualitative and/or quantitative information was available this has been used to inform the assessment. Objectives or key questions that are not supported by available data or information have been evaluated using spatial analysis, professional judgement and applicable assessment guidelines relating to that topic/objective.

Varying levels of uncertainty are inherent within the assessment process. The level of uncertainty of the option assessment for each SEA objective is included in the appraisal framework. Where there is significant uncertainty which precludes an effects assessment category being assigned for a particular SEA objective, an "uncertain" residual effects assessment label is applied to that specific SEA objective.

Table 4-3 SEA assessment matrix completed for each WRMP24 option.

SEA topic	SEA objective	Construction effects		Operational effects		Commentary	Mitigation	Residual construction effects		Residual operational effects	
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	0	-	0	-	etc	etc	0	0	0	-
Soil	etc										
Water											
etc											

[50] Office of the Deputy Prime Minister (ODPM), Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland (2005) A *Practical Guide to the SEA Directive and European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites*

[51] UKWIR (2021) *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans*. Report Ref. No. 21/WR/02/15

Table 4-4 Qualitative scoring system.

Score	Description	Symbol
Major/Significant Positive Effect	Major positive effect of the water resource option on this objective	+++
Moderate Positive Effect	Moderate positive effect of the water resource option on this objective	++
Minor Positive Effect	Minor positive effect of the water resource option on this objective	+
Neutral	Neutral effect of the water resource option on this objective	0
Minor Negative Effect	Negative effect of the water resource option on this objective	-
Moderate Negative Effect	Moderate effect of the water resource option on this objective	--
Major/Significant Negative Effect	Major negative effect of the water resource option on this objective	---
Uncertain	The water resource option has an uncertain relationship to the objective or the relationship is dependent on the way in which the aspect is managed. In addition, insufficient information may be available to enable an assessment to be made.	?

The outcomes of the SEA have been translated into metrics to feed into the WRSE multi-criteria optimisation for options selection, programme appraisal. They were also used as part of the Best Value Planning metrics Southern Water used to decide the Best Value Plan.

The completed assessment framework tables for each option are presented in **Appendices I, J and K**. The completed assessment framework table for each option is also accompanied by a summary comprising an overview of the adverse and beneficial.

A summary visual evaluation matrix has been completed for each option and is presented in **Section 5**, with outputs summarised by each WRZ. Each coloured box represents the assessed post mitigation significance of effect for that SEA objective for the particular WRMP24 option (for example, a red box indicates a major adverse significance of effect whilst blue indicates a negligible significance of effect and dark green a major beneficial significance of effect). Adverse and beneficial effects are kept separate in line with SEA best practice.

4.4.2 Secondary, cumulative and synergistic environmental effects

Schedule 2(6) of the SEA Regulations requires the assessment of "the likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects…." For the purposes of this report, "cumulative effects" is taken to include secondary and synergistic effects.

A cumulative effects assessment has been carried out in order to identify if different options are mutually exclusive or whether combinations of measures might lead to greater adverse impacts (or beneficial effects). This involved examining the likely significant effects of each of the WRMP24 options individually, in combination with each other (both inter- and intra- water resource zone), and in combination with the implementation of other plans and programmes. A matrix has been used to help consider interactions between the options. In assessing these effects, consideration has been given to other factors which may affect the receiving environment during implementation of the options.

The following cumulative assessments have been undertaken (see **Section 5** for the assessment findings):

- An assessment of cumulative effects as a result of fdWRMP24 options interacting with each other. Identified options where the construction phases (within a 5-year period) overlap with one another and where they also fall within 10km of each other. Following this, and informed by the WRSE environmental assessment methodology a receptor based approach was then carried out. Options were identified that fell within the distance thresholds to the receptors outlined below:
  - Sites of Special Scientific Interest (within 500m);

- Ancient Woodlands (within 50m);
- National Nature Reserves (within 500m);
- Marine Conservation Zones (within 500m);
- Historic landfill sites (within 1,000m);
- Authorised landfill sites (within 1,000m);
- Scheduled Monuments (within 500m);
- World Heritage Sites (within 500m);
- Conservation Areas (within 500m);
- Historic Battlefields (within 500m);
- Registered Parks and Gardens (within 500m);
- Listed Buildings (within 20m);
- National Landscapes (within 500m);
- National Parks (within 500m);
- Air Quality Management Areas (0m direct intersection only); and
- Major Roads (0m direct intersection only).

- Assessment of cumulative effects of the fdWRMP24 with the Southern Water Drought Plan, other water company WRMPs and drought plans.
- Assessment of potential cumulative effects of the Southern Water's fdWRMP24 with any other identified relevant programmes, plans and projects that may be in place / implemented during the period of the WRMP24.

Neighbouring water companies were invited to comment on the draft (2023) and revised draft (2024) WRMP24 and Southern Water is also continuing its communications with neighbouring companies regarding potential measures in their respective WRMPs to identify any new trans-boundary issues that may arise. Potential effects with other plans are identified, particularly in the context of spatial and temporal proximity.

4.4.3 Reasonable alternative plan assessment

SEA Regulation 12(2) requires the identification, description and evaluation of "the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme". The EC guidance[52] on the SEA Directive discusses possible interpretations of handling 'reasonable alternatives'. It states that "The alternatives chosen should be realistic. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme". Echoing this, Government guidance[53] of the SEA states "Only reasonable, realistic and relevant alternatives need to be put forward. It is helpful if they are sufficiently distinct to enable meaningful comparisons to be made of the environmental implications of each". It is an area of plan making that has received considerable scrutiny and challenge.

For the purposes of this SEA, the constrained options will be considered as reasonable alternatives to the revised preferred options (that comprise the preferred plan).

[52] EC (2003) *Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment.*

[53] Office of the Deputy Prime Minister et al (2005) *A Practical Guide to the Strategic Environmental Assessment Directive. Available from* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf [Accessed June 2019]

In addition, reasonable alternatives that operate at the plan level have been considered and the cumulative effects have been identified, described and for consideration along with the preferred plan. Southern Water has used an adaptive planning approach to the development of the fdWRMP24 as promoted by the National Framework and the WRPG. In consequence, Southern Water considered nine different situations as representative of different combinations of population growth, climate change and environmental ambition expressed as different magnitudes of supply-demand deficit.

There are then different branch and decision points. Southern Water has selected the core 'reported pathway', informed by discussion with WRSE and regulators which is fully adaptive across the whole range of the future situations. In using a WRSE methodology that converts individual option SEAs into metric values for use in decision making on the selection of the best value plan, Southern Water has however, been able to consider the environmental implications of the many different outcomes and possible plan pathways.

Given the complexities, the sophistication of the adaptive plan pathways and flexibility of the Preferred Plan, effective environmental assessment of outputs has focused on the Least Cost (Cost Efficient) (LCP) Plan and Best Value Environment and Societal Plan (BESP), consistent with WRPG requirements, WRSE outputs and assessments and regulator feedback.

4.5 Limitations of the assessment

SEA is a plan level assessment aimed at highlighting potential environmental concerns at a strategic level. Where particular limitations or outstanding issues are known, these are described in the SEA appraisal tables for the relevant water resources management option concerned. Further detailed assessment will still be required at the point of planning for the implementation of each option to take account of the prevailing environmental conditions and any new evidence that is available at that time.

Some broad assumptions have been applied when considering the potential for options. In summary:

- It is assumed that the relevant Catchment Abstraction Management Strategy (CAMS) documents are largely correct and reliable, and that there is 'water available for use' where this is confirmed by the CAMS.
- It is assumed that all normal licensing, consenting and management procedures will be employed at option delivery and throughout operation, and that established best-practice avoidance and mitigation measures will be employed throughout scheme design and construction to safeguard environmental receptors, including European site interest features.
- For desalination schemes, whilst it is possible that environmental changes could be experienced some distance from an outfall (mainly if there is limited mixing and stratified saline flows develop), many studies[54] have demonstrated that near-field dilution of brine to ambient levels typically occurs within a relatively short distance (tens or hundreds of metres rather than kilometres), and that impacts to benthic communities from concentrate discharges could be minimised by using properly-designed diffuser systems. However, at this stage, where appropriate a precautionary view on effects has been taken.
- For effluent re-use schemes it is assumed that all existing consents and permits (as they relate to water quality) can be met and that any material / effluent produced from the recovery process will be disposed of in landfill or returned to the head of the works for treatment (i.e. the recovery will reduce flow volumes but not water quality).

[54] e.g. Roberts DA, Johnston EL & Knott NA (2009) Impacts of desalination plant discharges on the marine environment: A critical review of published studies. *Water Research* 44 (2010) 5117-5128; Fernández-Torquemada Y, Gónzalez-Correa JM, Loya A, Ferrero LM, Díaz-Valdés M (2009) Dispersion of brine discharge from seawater reverse osmosis desalination plants. *Desalination and Water Treatment* 5 (2009) 137-145; Portillo E., Ruiz de la Rosa M., Louzara G., Quesada J.,. Ruiz J.M. & Mendoza H. (2014) Dispersion of desalination plant brine discharge under varied hydrodynamic conditions in the south of Gran Canaria, *Desalination and Water Treatment*, 52:1-3, 164-177.

- Whilst leakage scenarios have been identified within the fdWRMP24, detailed option information of an equivalence to that for the supply options has not been available for assessment and the option assessments have been completed, proportionate to the information available.
- The assessment is based on option information confirmed with Southern Water to ensure the timely completion of the necessary individual option assessments to include in this report to accompany the submission of the fdWRMP24.

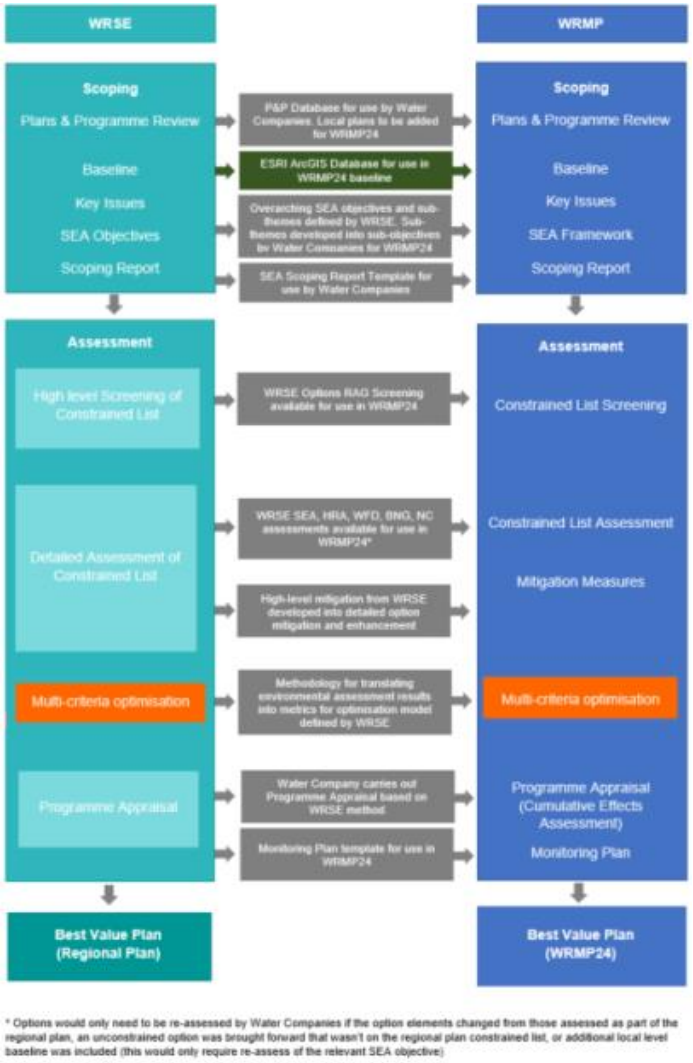
4.6 Links to the WRSE Regional Plan environmental assessment

The WRSE regional plan environmental assessments including the SEA has been used as a basis for the WRSE member water companies when undertaking their WRMP24 statutory environmental assessments.

Figure 4-1[55] shows the interactions between the two processes and information shared from the regional plan environmental appraisal to support the water company WRMP24 development process. The approach aims to reduce the amount of work individual water companies need to undertake during WRMP24, streamline the environmental assessment process, and ensure consistency across water company environmental assessments.

[55] WRSE (2023) *WRSE Regional Plan Strategic Environmental Assessment Report.* Report for WRSE by Mott MacDonald Figure 4-2

Figure 4-1 Interactions Figure 2: Interactions and Information exchange between the WRSE assessment and WRMP process.



The interactions and the need for consistency between the Regional Plan and the WRMP's assessments has meant that the assessment framework and resultant Southern Water constrained option assessments are consistent with those used in the WRSE Emerging and Draft Regional Plan SEA[56]. These were completed to support the decision making and investment modelling completed by WRSE.

[56] WRSE (2023) *WRSE Regional Plan Strategic Environmental Assessment Report*. Report for WRSE by Mott MacDonald.

4.6.1 SEA inputs into decision making

The WRSE methodology also includes a translation of the SEA outputs into numerical values to incorporate the SEA findings directly into the WRSE investment model. The SEA metrics were based on the option (including embedded mitigation) results and included construction and operation effects combined. These are illustrated in **Table 4-5** below.

Table 4-5 WRSE SEA Scoring.

Effect	Description	Numerical Value
+++	Major Positive	+8
++	Moderate Positive	+4
+	Minor Positive	+1
0	Neutral	0
-	Minor Negative	-1
--	Moderate Negative	-4
---	Major Negative	-8

Two metrics were developed, one for positive effects and one for negative effects. The positive results were summed, and the negative results were summed to give the two metrics. WRSE state[57] that "The advantages of this approach are that it is straightforward and easy to understand, and it avoids the trading and cancelling out of effects (if positive and negative effects are added together in one metric). It also has the additional advantage of alleviating some of the issues of hidden significant effects and cumulative minor effects because of using more pronounced values between minor and major effects…. It is acknowledged that there is a risk of simplification of actual positive and negative effects from combining the SEA results into just two metrics. The programme appraisal reviewed potential biases and considered near alternatives and actual positives and negatives to ensure effects were not being masked by the metrics."

Appendix 6: Environmental Assessment of the WRSE Revised Draft Regional Plan[58] sets out how the environmental metrics were used in the investment model to develop the WRSE Regional Plan.

[57] WRSE (2023) *WRSE Regional Plan Strategic Environmental Assessment Report*. Section 4.2.2.1

[58] WRSE (2023) *WRSE Revised Draft Regional Plan*. Available online: https://www.wrse.org.uk/media/kton3scy/wrse-revised-draft-regional-plan-august-2023-v1-1.pdf

5 Assessment of fdWRMP24

This section presents an assessment of the fdWRMP24.

Section 5.1 presents an analysis of the compatibility of the fdWRMP24 objectives with the SEA objectives to determine the extent to which there may be any inherent inconsistencies which are then reflected in proposed options identified to progress the plan objectives. **Section 5.2** summarises the assessment of the effects from the 300 constrained options. **Section 5.3** details the changes to the fdWRMP24, and **Sections** Error! Reference source not found. **to** Error! Reference source not found. summarise the likely significant po st-mitigation positive and negative effects for the options selected within the central, western and eastern region of Southern Water fdWRMP24. **Section 5.7** summarises the effects from the demand management and leakage options and **Section 5.8** summarises the likely significant effects by topic and by WRZ.

5.1 Compatibility of the fdWRMP24 objectives with the SEA objectives

The over-arching 'best value' planning objectives of Southern Water fdWRMP24 to meet statutory and policy requirements are:

- Deliver a secure and wholesome supply of water to customers and other sectors to 2100;
- Deliver environmental improvement and social benefit;
- Increase the resilience of the region's water systems;
- Deliverable at a cost that is acceptable to customers.

A compatibility assessment of these objectives has been completed against the SEA objectives and is presented in Table 5-1. Any incompatibilities, if identified, would then be reflected in the subsequent assessment of the options to deliver the plan objectives.

The compatibility matrix demonstrates that the fdWRMP24 objectives and SEA objectives are broadly compatible with one another. The great majority of interactions between elements of the fdWRMP24 objectives and the SEA objectives have either a positive relationship or have no direct or an uncertain relationship. This reflects the scope and intent of the plan which are likely to broadly result in the positive environmental outcomes against the objectives.

However, there are a number of potentially uncertain relationships associated with the fdWRMP24 Objective: *"Deliver a secure and wholesome supply of water to customers and other sectors to 2100"* and the following SEA objectives:

- Protect and enhance biodiversity and vulnerable habitats
- Reduce and minimise air emissions.
- Reduce embodied and operational carbon emissions
- Conserve, protect and enhance landscape, townscape and seascape character and visual amenity
- Conserve, protect and enhance the historic environment, including archaeological remains
- Minimise resource use and waste production

In these instances, particular attention will need to be paid to proposals that seek to increase water storage capacity and/or supply through appropriate impact assessment of specific schemes, as well as the likely mitigation of emissions and resource use associated with construction and operation.

Table 5-1 SEA and fdWRMP24 objectives compatibility matrix.

SEA objectives	WRMP24 Objectives			
	Deliver a secure and wholesome supply of water to customers and other sectors to 2100	Increase the resilience of the region's water systems	Deliver environmental improvement and social benefit	Deliverable at a cost that is acceptable to customer
1. Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	/	+	+	+
2. Protect and enhance the functionality, quantity and quality of soils	0	+	+	+
3. Increase resilience and reduce flood risk	+	+	+	+
4. Protect and enhance the quality of the water environment and water resources	+	+	+	+
5. Deliver reliable and resilient water supplies	+	+	+	+
6. Reduce and minimise air emissions	/	+	+	+
7. Reduce embodied and operational carbon emissions	/	+	+	+
8. Reduce vulnerability to climate change risks and hazards	+	+	+	+
9. Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	/	+	+	+
10. Conserve, protect and enhance the historic environment, including archaeological remains	/	0	+	+
11. Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	+	+	+	+
12. Maintain and enhance tourism and recreation	+	+	+	+
13. Minimise resource use and waste production	/	+	+	+
14. Avoid negative effects on built assets and infrastructure	0	0	+	+

Key to Table 5-1 to illustrate the compatibility.

+	Objectives are compatible	0	Objectives are not related
-	Objectives are potentially incompatible	/	Uncertainty over relationship

5.2 Assessment of the effects of the constrained options by WRZ

Constrained options to resolve the deficits for each of the 14 WRZs in Southern Water's operational area have been developed and considered as part of the preparation of the WRMP. Assessment of the constrained options has been carried out in accordance with the methodology described in **Section 4**.

SEA assessment framework tables have been completed for each of the 300 constrained options and are presented in full in Appendix IAppendix K Revised Preferred Options Assessments.

As would be expected given the wide range of water resource options considered, a diverse range of effects have been identified for options, noting that the assessment was proportionate to the level of information available. Significant effects were identified for SEA topics including biodiversity, flora and fauna, landscape, population and human health, with effects on designated sites and features a key determinant of identifying likely significant effects:

The findings of the completed individual option SEA were used as part of the more detailed option screening, with considered the following criteria:

- **Environmental and social assessment** - which used the findings of the SEA and HRA screening to highlight:
  - the risk of adverse effects and, where available, mitigation measures; and
  - the opportunity for beneficial effects (e.g. improved water quality, reduced flood risk, improved catchment management) resulting from the option.
- **Links to other options** - in terms of mutual exclusivities and dependencies
- **Risks** - including vulnerability of the option to future uncertainty relating to climate change impacts, regulatory changes, sustainability and acceptability of the option, potential planning constraints and risks and changes in customer behaviour (for some demand management options).
- **Phasing** - whether the option can be constructed in a phased or modular way, which would increase its flexibility to future changes in the forecast supply-demand balance.
- **Resilience** - an indication of the confidence that the option will 'deliver' the required supply-demand balance benefit.

In moving from constrained options to preferred options, the reasons why options have not been selected includes effects identified through the SEA (and HRA and WFD processes), for example:

- Potential effects upon SSSI/SAC from options which could not be addressed by standard mitigation measures or construction best practice (or arise from option operation) with an acknowledgement that any adverse unmitigable effects would increase risk of planning consent not being granted.
- Significant and potentially non-compliant effects on water quality from option operation during period of low flows.
- Option uncertainties arising from insufficient progress on option definition resulting in potential, environmental effects.

Detailed information on the appraisal of each option is included in the completed Water Resources Planning Tables 2024 (a technical annex to the fdWRMP24) and in particular worksheet 4 'Options Appraisal Summary' which presents an appraisal of all options with key cost, benefit and natural capital metrics. The fdWRMP24 Annex 12 (Options Appraisal) has also been updated to include information on the individual schemes and the process of option appraisal which includes outline reasons for the rejection of options.

5.3 Assessment of the effects of the revised preferred supply options

The 300 constrained options have been refined through the option screening process. For the fdWRMP24, Southern Water has selected 123 preferred options (following the process set out **Section 1.4.3)** requiring assessment through the SEA, comprising of:

- 60 supply options comprising of:
  - Transfers between WRZs and water companies (11 interzonal transfers and 13 bulk import options);
  - 11 desalination options (across four locations) in four WRZs;
  - 13 groundwater options;
  - eight recycling options;
  - two storage options;
  - one asset enhancement option; and,
  - one improved treatment capacity option
- 6 supply-side drought options;
- 40 demand management drought options (consisting of three option types applied across the WRZs);
- 12 generic demand management options; and
- 5 generic leakage options.

SEA assessment framework tables have been completed for each of the preferred options and are presented in full in **Appendix K** Revised Preferred Options Assessments. It should be noted that options selected across all nine situations in the adaptive plan have been assessed through the SEA process.

The suite of preferred options assessed for the dWRMP24 and rdWRMP24 has been updated for the fdWRMP24 as follows:

- the removal of options that are no longer required for clarity / consistency where bi-directional schemes are proposed, or in relation to bulk export options, which are considered by the recipient water company WRMP24 assessments;
- The assessments of T2ST Option B and T2ST Option C, which were previously based on RAPID assessments, have been replaced by the following option assessments[59]:
  - Bulk import (HAZ): T2ST to Andover (20Ml/d);
  - Bulk import (HKZ): T2ST to HKZ (5Ml/d);
  - Bulk import (HWZ): T2ST to Yew Hill (95Ml/d)

[59] Bulk import (HAZ): T2ST to Andover (20Mld) and Bulk import (HKZ): T2ST to HKZ (5Ml/d) are considered through the assessment of Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d). Essentially, two pipelines will be required to deliver Bulk import (HAZ): T2ST to Andover (20Mld) and Bulk import (HKZ): T2ST to HKZ (5Ml/d), with Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) (this option) then utilising both of these for bi-directional distribution.

- the addition of three new 'resilience options' comprising two new supply-side groundwater schemes and one new drought option (which was then subsequently removed for the fdWRMP24);
- the inclusion of two WRMP19 options that were not explicitly noted previously;
- minor amendments to some supply-side network schemes (reflecting further engineering information);
- amendments to the earliest year of implementation and/or yield for some options;
- other minor amendments to reflect consultation responses.

The following sections (Section 5.4, 5.5 and 5.6) present a summary of the assessment of the preferred options organised by region. Within each section effects are summarised by WRZ. The effects are summarised for preferred options wholly within the WRZ and separately for those which act across WRZs (the interzonal options) where relevant. For each WRZ a summary is presented of the revised preferred options based on the information provided by Southern Water. Effects are presented as colour-coded visual evaluation (VE) summary matrices (Table 5-2) against each of the objectives in the SEA framework (Table 4-2**Error! Reference source not found.**). The colour coding of the assessment reflects a range from major adverse effect in red through to major beneficial effects in dark green as shown in the legend below (consistent with the qualitive scoring matrix presented in Table 5-3.

Table 5-2 Visual evaluation matrix summary (post mitigation).

SEA topic	SEA objective	Construction effects		Operational effects		Commentary	Mitigation	Residual construction effects		Residual operational effects	
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	0	-	0	-	etc	etc	0	0	0	-
Soil	etc										
Water	etc										

Table 5-3 SEA key.

+++	Significant Positive	-	Minor Negative
++	Moderate Positive	--	Moderate Negative
+	Minor Positive	---	Significant Negative
0	Neutral	?	Uncertain

5.4 Central area

5.4.1 Sussex North (SNZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-4, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-5.

Table 5-4 Summary of options for SNZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d)	23	Pulborough Surface water (Phases 1 to 3) Drought permit/order (2025 onwards).	2026
Drought option - demand side (SNZ): NEUBs	3.64	Non-essential use ban - SNZ WRZ.	2026
Drought option - demand side (SNZ): Reduce transfer to other commercial customers	0.11	Drought option: In the event of a drought, the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027
Drought option - demand side (SNZ): TUBs	2.27	Temporary use bans - SNZ WRZ.	2026
Groundwater (SNZ): New borehole at Petworth (4Ml/d)	4	This scheme would return an existing WSW (Haslingbourne) to service. The site has been out of supply due to poor water quality. The scheme would be to drill a new borehole in the Hythe Formation approximately 700m south of the existing WSW. Borehole to be minimum c. 300mm dia ID, and c. 80m depth. Connection to the treatment works and refurbishment of the treatment works would be required.	2031
Recycling (SNZ): Littlehampton with direct river discharge (15Ml/d)	15	This scheme proposes the transfer of treated effluent from Littlehampton WwTW to a new discharge point on the western River Rother upstream of the Pulborough Surface Water abstraction. This would support flows over the weir as the MRF	2031

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Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
		is approached, therefore prolong production at Pulborough during a drought. 20Ml/d represents the upper end of the reliable flow that could be expected from Ford WwTW. Once abstracted at Pulborough WSW this water would be used to meet demand in the Sussex North WRZ.	
Recycling (SNZ): Horsham with storage at Pulborough (6.8Ml/d)	6.8	New resource. This option is a new 9.5Ml/d water recycling plant producing a DO of 6.8Ml/d near Horsham WwTW and a transfer of the treated effluent to Church Farm reservoir, which feeds into Pulborough WSW. Process losses have been included.	2058
Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d)	19.5	The option involves the construction of an earth embankment reservoir near Blackstone with a proposed storage capacity of up to 4,600 Ml. The option will allow treated water to enter the distribution network to supply either the Sussex coastal block or the Pulborough area. The reservoir will be filled with water pumped from the eastern branch of the River Adur. The abstraction of raw water from the river to the reservoir would have a maximum flow of 30Ml/d.	2046
Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d)	40	This is a pipeline to represent reverse flow from Havant Thicket Reservoir to Pulborough through a bidirectional raw water transfer from Pulborough to Havant Thicket. INNS treatment will be provided at Hardham.	2040
Bulk import (SNZ): SES to SNZ (10Ml/d)	10	Proposed new bi-directional transfer from SES Outwood To Southern Water Buchen Hill, Crawley. 10Ml/d transfer flow rate.	2034
Bulk import (SNZ): SES re-zoning (4Ml/d)	4	Extension of current re-zoning of supplies to SES water in SNZ beyond 2025 for up to 4Ml/d.	2026

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Bulk import (SNZ): SEW RZ5 to Pulborough	10	A transfer between Tilmore and Hardham (possible gravity transfer from Tilmore to Hardham).	2040
Groundwater (SNZ): Petersfield refurbishment (1.6Ml/d)	1.96	The proposed scheme involves both borehole rehab and work to improve the network.	2029
Groundwater (SNZ): Reinstate West Chiltington (3.1Ml/d)	3.12	The proposed scheme is to return an existing SWS groundwater site into supply.	2029

Table 5-5 Visual evaluation matrix summary (post mitigation) for SNZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Env	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health/ well-being	Tourism/ recreation	Resource use	Built assets
Sussex North (SNZ)	Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	++	0	0	+	0	0	+	0	0	0
		Operation (negative)	--	0	0	---	0	0	0	-	-	0	0	-	-	0
Sussex North (SNZ)	Drought option - demand side (SNZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Sussex North (SNZ)	Drought option - demand side (SNZ): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Sussex North (SNZ)	Drought option - demand side (SNZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Sussex North (SNZ)	Groundwater (SNZ): New borehole at Petworth (4Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	0	0	0	0	-	0	--	0	0	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Env	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health/ well-being	Tourism/ recreation	Resource use	Built assets
		Operation (negative)	-	0	0	--	0	0	0	-	--	0	0	0	0	0
Sussex North (SNZ)	Recycling (SNZ): Littlehampton with direct river discharge (15Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	--	0	0	-	--	0	-	--	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	--	0	0	--	0	0	--	0	0	0	0	0	0	0
Sussex North (SNZ)	Recycling (SNZ): Horsham with storage at Pulborough (6.8Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	-	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	-	0	0	-	0	0	-	0	-	0	0	0	0	0
Sussex North (SNZ)	Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	--	-	-	0	-	0	0	-	-	-	-	-	-
		Operation (positive)	+	0	0	0	+	0	0	0	0	0	0	+	0	0
		Operation (negative)	--	0	-	--	0	0	-	-	--	0	0	0	0	0
Sussex North (SNZ)	Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	-	0	0	0	-	0	--	-	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	0	0	0	0
		Operation (negative)	-	0	0	0	0	0	--	0	0	0	0	0	0	0
Sussex North (SNZ)	Bulk import (SNZ): SES to SNZ (10Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	0	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0

WATER for LIFE from Southern Water

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Env	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health/ well-being	Tourism/ recreation	Resource use	Built assets
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sussex North (SNZ)	Bulk import (SNZ): SES re-zoning (4Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	0	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Sussex North (SNZ)	Bulk import (SNZ): SEW RZ5 to Pulborough	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	0	-	0	0	-	-	0	--	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sussex North (SNZ)	Groundwater (SNZ): Petersfield refurbishment (1.6Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	-	0	-	-	0	0	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	+	0	0	0
		Operation (negative)	-	0	0	--	0	0	-	0	0	0	0	0	0	0
Sussex North (SNZ)	Groundwater (SNZ): Reinstate West Chiltington (3.1Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	+	0	0	0
		Operation (negative)	-	0	0	--	0	0	-	0	-	0	0	0	0	0

Construction effects

Four options (Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d), Drought option - demand side (SNZ): NEUBs, Drought option: Reduce transfer to other commercial customers – SNZ, Drought option - demand side (SNZ): TUBs) were assessed as having a neutral effect against all objectives for the construction phase, as the nature of these options would involve operational changes only and no construction would be required for their implementation. The construction effects of the remaining ten options are described in the remainder of this subsection.

No positive effects or likely significant positive effects were identified from the assessment of construction phase impacts for the preferred options. No likely significant negative effects were identified from the assessment of construction phase impacts for the preferred options.

One of the options (Bulk import (SNZ): SEW RZ5 to Pulborough) was assessed as having a potentially moderate negative effect on the Biodiversity and Landscape SEA objectives, associated with the potential for construction works to affect designated and/or non-designated habitats, species, features and ancient woodland through direct land take, pollution, INNS transfer, noise and/or disturbance (e.g. vibration, dust). The HRA screened in Arun Valley Ramsar/SAC/SPA, The Mens SAC, Ebernoe Common SAC, and Singleton and Cocking Tunnels SAC for appropriate assessment but found that adverse effects will not occur or are clearly avoidable.

It was considered that one option (Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d)) would have a moderate negative effect on the Soils, Geodiversity, Land Use SEA objective, due to the anticipated permanent loss of grade 3 (and grade 4) agricultural land for creation of a new reservoir.

One of the options (Recycling (SNZ): Littlehampton with direct river discharge (15Ml/d)) was assessed as having a potentially moderate negative effect on the Water - Resilience SEA objective due to flood risk during construction, as approximately half of the option is located within Flood Zones 2 and 3; this option was also considered to have a moderate negative effect on the Carbon Emissions SEA objective, associated with the scale of embodied carbon and emissions from construction activities identified for the option infrastructure.

Three of the options (Groundwater (SNZ): New borehole at Petworth (4Ml/d), Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d), and Bulk import (SNZ): SEW RZ5 to Pulborough), were assessed as having a moderate negative effect on the Landscape SEA objective, associated with construction activities for these options taking place within the designated landscape of the South Downs National Park.

Recycling (SNZ): Littlehampton with direct river discharge (15Ml/d) was assessed a moderate negative for the Historic Environment SEA objective in recognition that pipeline routing should be considered to avoid crossing three Scheduled Monuments which is considered achievable.

All other negative construction effects for the preferred options were identified as minor.

Operational effects

All of the 14 preferred options were assessed as having a positive effect against the Water - Reliability SEA objective during the operation phase, as the anticipated additional water yield or reduction in water demand would help to deliver reliable and resilient water supplies. In-line with the potential for additional water supply capacity two of the preferred options (Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d) , and Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d)) were considered to have a moderate positive effect for Water - Reliability, with the remaining options identified as having a minor positive effect for this SEA objective.

No significant positive effects were identified during the assessment of the operation phase of the preferred options; however, minor positive effects were identified against some of the other SEA objectives. Six of the preferred options were identified as having a positive effect on the Climate Change SEA objective. Two drought options (Drought option - demand side (SNZ): NEUBs and Drought option - demand side (SNZ): TUBs) were identified as having minor positive effects across a wider range of the SEA objectives related to

Biodiversity, Water - Quality and Reliability, Climatic Factors - Climate Change, Landscape, Historic Environment, Population & Human Health - Health & Wellbeing and Material Assets - Resource Use.

For the drought option Drought option - demand side (SNZ): NEUBs significant negative effects were identified for the Health & Wellbeing SEA objective in the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. The drought option Drought option - demand side (SNZ): TUBs was identified as having a moderate negative effect against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d) was assessed as having a significant negative effect on the Water – Quality SEA objective, reflecting that the WFD assessment (2025) of the Southern Water Drought Plan 2022 highlights that with regard to the Wester Rother river waterbody, there is a high risk of temporary deterioration in status due to impacts on some fish species and there is a high risk of impacting downstream water body (Arun). Whilst for the Arun transitional waterbody there is a medium risk of temporary deterioration in status due to impacts on fish, invertebrate and macroalgal communities. Furthermore, the SEA assessment (2025) of the Southern Water Drought Plan 2022 highlights that the implementation of the Drought Permit would result in a major adverse effect on flows in the River Rother in summer and moderate adverse effects in winter. There would be associated moderate adverse impact on water quality and ecology, notably migratory fish and the Least Water Snipe Fly.

Five other options (Groundwater (SNZ): New borehole at Petworth (4Ml/d), Recycling (SNZ): Littlehampton with direct river discharge (15Ml/d),, Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d), Groundwater (SNZ): Petersfield refurbishment (1.6Ml/d) and Groundwater (SNZ): Reinstate West Chiltington (3.1Ml/d)) were assessed to have moderate negative effects on the Water - Quality SEA objective during operation, due to the potential for WFD non-compliance (low confidence) associated with possible changes on the hydromorphology and physico-chemistry of relevant water bodies affecting aquatic habitats.Recycling (SNZ): Horsham with storage at Pulborough (6.8Ml/d) was assessed as having a minor negative effect on the Water – Quality SEA objective.

Three options (Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d), Recycling (SNZ): Littlehampton with direct river discharge (15Ml/d) and Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d)) were assessed to have moderate negative effects on the Biodiversity SEA objective, attributed to various factors including reductions in flow resulting in adverse impacts on downstream flora and fauna (particularly during drought periods when ecosystems are under stress), and the potential for INNS transfer to sensitive downstream habitats associated with use of a proposed storage reservoir.

Two options (Recycling (SNZ): Littlehampton with direct river discharge (15Ml/d), and Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d)), were assessed as having moderate negative effects on the Carbon Emissions SEA objective, associated with operations for the transfer of treated effluent.

Two options (Groundwater (SNZ): New borehole at Petworth (4Ml/d) and Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d)) were identified to have potential moderate negative effects on the Landscape SEA objective, associated with the location of operational infrastructure (a reinstated treatment works and a new reservoir) either within or within the setting of the designated landscapes of the South Downs National Park and the High Weald National Landscape.

Drought option - demand side (SNZ): NEUBs was also identified as having a moderate negative effect against the Tourism & Recreation SEA objective through reducing the quantity of water made available for tourist attractions and water consuming recreational activities (swimming pools, watering sports pitches etc) during times of drought, which could dissuade tourists to the area for a brief period of time.

All other negative operation effects for the preferred options are identified as minor.

Interzonal transfer options

There is one interzonal transfer option (Interzonal transfer (SNZ-SWZ): Pulborough to Worthing) within the Sussex North WRZ. For this option the Sussex North WRZ is the source zone, whilst the Sussex Worthing WRZ is the recipient zone. The option is described in Table 5-6 whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-7.

Table 5-6 Summary of interzonal options (SNZ).

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (SNZ-SWZ): Pulborough to Worthing	34.91	Additional pipeline to provide extra capacity along the existing transfer route between Sussex North and Sussex Worthing	2040

Table 5-7 Visual evaluation matrix summary (post mitigation) for SNZ interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Env	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health/ well-being	Tourism/ recreation	Resource use	Built assets
SNZ	Interzonal transfer (SNZ-SWZ): Pulborough to Worthing	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	0	-	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0

Construction effects

No positive or significant positive effects were identified for option Interzonal transfer (SNZ-SWZ): Pulborough to Worthing during the construction phase.

No significant negative effects were identified for option Interzonal transfer (SNZ-SWZ): Pulborough to Worthing during the construction phase, however, the option was assessed as having a moderate negative effect against the biodiversity SEA objective, due to potential for disturbance (noise, dust, air quality) on designated sites. The option is immediately adjacent to Parham Park SSSI whilst a further six SSSIs are within 1km of the option.

Minor negative effects were identified against the water resilience, air, carbon emissions, landscape, historic environment, health & wellbeing, tourism & recreation, resource use and built assets SEA objectives.

Operational effects

No significant positive or significant negative were identified for option Interzonal transfer (SNZ-SWZ): Pulborough to Worthing during the operational phase. However, a moderate positive effect was identified against the water reliability SEA objective (described in Section 5.4.2), whilst a minor negative effect was identified against the carbon emissions SEA objective.

5.4.2 Sussex Worthing (SWZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-8, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-9.

Table 5-8 Summary of options for SWZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Desalination (SWZ): Tidal River Arun (10Ml/d)	10	This option proposes a desalination plant to treat seawater abstracted off the coast near Littlehampton to supply treated water to the Sussex Worthing WRZ. It is assumed that the water could be used during drought conditions to meet demand in Sussex Worthing WRZ. There is bi-directional transfer between Sussex Worthing WRZ and Sussex North WRZ which means this option could have result in additional benefit to Sussex North WRZ. This transfer would likely require additional connectivity between Perry Hill WSS and Tennants Hills WSR. An investigation in AMP4 indicated that land adjacent to Ford WwTW showed the greatest potential for a new desalination site because of the existing land use, the availability of services (access roads, power, etc.). Development in this area is progressing rapidly and land allocation for the site would need to be secured within the local plan to ensure its available when the scheme is needed.	2046
Desalination (SWZ): Tidal River Arun (20Ml/d)	20	This option proposes a desalination plant to treat seawater abstracted off the coast near Littlehampton to supply treated water to the Sussex Worthing WRZ; however, is for a higher yield.	2041
Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2	20	This option proposes a second phase development of an additional 20Ml/d desalination capacity to treat estuarine water from the tidal River Arun to supply treated water to the Sussex Worthing WRZ. This option is contingent on the first phase 10Ml/d or 20Ml/d desalination plant options (Aru10 or Aru20).	2050
Drought option - demand side	2.55	Non-essential use ban - SWZ WRZ	2026

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
(SWZ): NEUBs			
Drought option - demand side (SWZ): Reduce transfer to other commercial customers	0.07	Drought option: In the event of a drought the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027
Drought option - demand side (SWZ): TUBs	1.6	Temporary use bans - SWZ WRZ	2026
Treatment capacity (SWZ): Pulborough winter transfer stage 1 (2Ml/d)	2	During the winter there is surplus surface water within the River Rother. This scheme would allow the surplus to be used at Pulborough WSW (within licence constraints) which in turn would allow coastal groundwater sources to be rested. This increase in groundwater can be utilised through new transfer mains from Sussex Worthing WRZ to Sussex Brighton WRZ via Shoreham WSW, providing the additional 2Ml/d of water to Brighton WRZ during the summer and autumn of a drought year. This is Phase 1, which is to provide a permanent sludge treatment facility at Pulborough WSW.	2041

Table 5-9 Visual evaluation matrix summary (post mitigation) for SWZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Sussex Worthing	Desalination (SWZ): Tidal River Arun (10Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	--	-	-	0	-	--	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	--	0	-	--	0	-	--	0	-	0	0	0	-	0
Sussex Worthing	Desalination (SWZ): Tidal River Arun (20Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	--	-	-	0	-	--	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	+	0	0	0	0	0	0
		Operation (negative)	--	0	-	--	0	-	--	0	-	0	0	0	-	0
Sussex Worthing	Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Construction (negative)	--	--	-	-	0	-	--	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	+	0	0	0	0	0	0
		Operation (negative)	--	0	-	--	0	-	--	0	-	0	0	0	-	0
Sussex Worthing	Drought option - demand side (SWZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Sussex Worthing	Drought option - demand side (SWZ): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Sussex Worthing	Drought option - demand side (SWZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Sussex Worthing	Treatment capacity (SWZ): Pulborough winter transfer stage 1 (2Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	0	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	+	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0

Construction effects

No positive or likely significant positive effects were identified for construction.

No likely significant negative effects have been identified for construction.

Four options (Desalination (SWZ): Tidal River Arun (10Ml/d); Desalination (SWZ): Tidal River Arun (20Ml/d); and Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2and Treatment capacity (SWZ): Pulborough winter transfer stage 1 (2Ml/d)) were assessed as having a negative effect on the biodiversity SEA objective, with those option for the Arun desalination schemes determined as a moderate negative effect. This is associated with the potential for construction works to affect designated and/or non-designated habitats, species and features and ancient woodland through noise and/or disturbance (e.g. vibration, dust).

Moderate negative effects are also assessed for the Arun desalination schemes for the soil SEA objective due to the location of development on agricultural land assessed as BMV. All other negative construction effects for these options are identified as minor.

Three options (Drought option - demand side (SWZ): NEUBs, Reduce transfer to other commercial customers; and Drought option - demand side (SWZ): TUBs) were assessed as having neutral effects as they would involve no construction and would involve operational changes only.

Operational effects

No significant positive effects were identified for operation.

Positive effects were assessed for all options for the Water - reliability SEA objective, reflecting the positive impact on water resilience, with two options (Desalination (SWZ): Tidal River Arun (20Ml/d), and Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2) assessed as having moderate positive effects, as opposed to the minor positive effects assessed for the remaining options in this zone. Seven options were identified as having positive effects on climate change SEA objective. Two drought options (Drought option - demand side (SWZ): NEUBs and Drought option - demand side (SWZ): TUBs) were identified as having minor positive effects across a wider range of SEA objectives related to biodiversity, water quality and reliability, climatic factors - climate change, landscape, historic environment, population & human health - health & well-being and material assets - resource use.

For Drought option - demand side (SWZ): NEUBs, significant negative effects were identified for the Health and wellbeing SEA objective in the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. This is the only significant negative effect associated with any of the options. Drought option - demand side (SWZ): TUBs was identified as having moderate negative effects against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

Moderate negative effects were assessed for the Arun desalination options (Desalination (SWZ): Tidal River Arun (10Ml/d); Desalination (SWZ): Tidal River Arun (20Ml/d); and Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2) for SEA objectives related to biodiversity and water quality. For biodiversity, moderate effects were identified in relation to the hypersaline discharge however the HRA appropriate assessment found no adverse effects on the integrity from operation. The water quality assessment reflects the findings of WFD assessment of potential non-compliance (with low confidence) for the Sussex coastal waterbody related to hypersaline discharge.

Drought option - demand side (SWZ): NEUBs was identified as having a moderate negative effect against the population & human health - tourism & recreation SEA objective through reducing the quantity of water made available for tourist attractions and water consuming recreational activities (swimming pools, watering

sports pitches etc) during times of drought, which could dissuade tourists to the area for a brief period of time.

All other residual negative effects were identified as minor.

Interzonal transfer options

There arethree interzonal transfer options within the Sussex Worthing WRZ. For option Interzonal transfer (SNZ-SWZ): Pulborough to Worthing, the Sussex Worthing WRZ would be the recipient zone, whilst the Sussex North WRZ would be the source zone. A summary of this option is presented in Table 5-6 (Section 5.4.1), whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-7 (Section 5.4.1); in order to avoid undue duplication, these tables are not repeated here.

For option Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d), the Sussex Worthing WRZ would be the source zone, whilst the Sussex Brighton WRZ would be the recipient zone. Meanwhile Interzonal transfer (SBZ-SWZ): Brighton to Worthing would involve a bi-directional transfer between the same zones. These options are described in Table 5-10 below, whilst a summary of the assessment of their effects (post mitigation) is set out in

Table 5-11 below.

Table 5-10 Summary of interzonal options for SWZ

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d)	3	During the winter there is surplus surface water within the River Rother. This scheme would allow the surplus to be used at Hardham WSW (within licence constraints) which in turn would allow coastal groundwater sources to be rested. This increase in groundwater can be utilised through new transfer mains from Tenants Hill to Patcham WSR via Shoreham WSW, providing the additional 2Ml/d of water to Brighton WRZ during the summer and autumn of a drought year. This is Phase 2, which is to provide a transfer from Pulborough surface water abstraction to Sussex Brighton WRZ (Shoreham WSR) to allow groundwater sources in SBZ to be rested.	2041
Interzonal transfer (SBZ-SWZ): Brighton to Worthing	16.71	New bi-directional transfer between Sussex Worthing and Sussex Brighton Water Resource Zones.	2041

Table 5-11 Visual evaluation matrix summary (post mitigation) for SWZ interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Sussex Worthing (SWZ)	Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	+	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	-	0	0	0	0	0
Sussex Worthing (SWZ)	Interzonal transfer (SBZ-SWZ): Brighton to Worthing	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	-	0	-	-	-	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0

Construction effects

As described in Section 5.4.1 for option Interzonal transfer (SNZ-SWZ): Pulborough to Worthing, no significant positive effects or significant negative effects were identified during the assessment of the construction phase.

Similarly, for options Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) and Interzonal transfer (SBZ-SWZ): Brighton to Worthing, no likely significant positive or positive effects were identified in the assessment of the construction phase.

No significant negative effects were identified.

Both options were assessed as having moderate negative effects against the biodiversity SEA objective. Both options were also assessed as having minor negative effects on the soils, geodiversity and land use, water resilience, water quality, carbon emissions, landscape, historic environment, health & wellbeing, tourism & recreation, resource use and built assets SEA objectives, whilst Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) was also assessed as having a minor negative effect on the air SEA objective and Interzonal transfer (SBZ-SWZ): Brighton to Worthing were assessed as having a minor negative effect on the climate change SEA objective.

Operational effects

As described in Section 5.4.1, for option Interzonal transfer (SNZ-SWZ): Pulborough to Worthing, no significant positive effects or significant negative effects were identified during the assessment of the operational phase, however, a moderate positive effect was identified against the water reliability SEA objective, associated with the increase transfer capacity, and associated improvement in the resilience of supply in the Sussex Worthing WRZ.

For Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) and Interzonal transfer (SWZ-SBZ): Worthing to Brighton no moderate or significant positive effects were identified in the assessment of the operational phase. For both options, minor positive effects were identified against the water reliability and climate change objectives, and a minor positive effect was identified against water quality for option Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d).

No significant negative effects were identified. For these options (Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) and Interzonal transfer (SBZ-SWZ): Brighton to Worthing) a minor positive effect was identified against the climate change SEA objective, whilst for option Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) a minor positive effect was also identified against the water quality SEA objectives. For both options, minor negative effects were identified against the carbon emissions SEA objective, whilst for Interzonal transfer (SBZ-SWZ): Brighton to Worthing a minor negative effect was identified against the air SEA objective, and for option Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) a minor negative effect was identified against the landscape SEA objective.

5.4.3 Sussex Brighton (SBZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-12, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-13.

Table 5-12 Summary of options for SBZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option -demand side (SBZ): NEUBs	4.57	Non-essential use ban - SBZ WRZ.	2026
Drought option - demand side (SBZ): Reduce transfer to other commercial customers	0.16	Drought Option: In the event of a drought the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027
Drought option - demand side (SBZ): TUBs	2.85	Temporary use bans - SBZ WRZ	2026
Bulk import (SBZ): SEW to Rottingdean (20Ml/d)	20	This option is for a pipeline to transfer flow from SEW Barcombe WSW to Rottingdean (20Ml/d)	2066
Groundwater (SBZ): Lewes Road (3.5Ml/d)	3.5	Lewes Road is a is a well and audit system that has been out of supply for over 10 years due to poor water quality. The scheme would refurbish the water supply works and add additional water treatment. It would also increase pump capacity and WSR connectivity so that Lewes Road groundwater source works can pump to its Middle or High WSR (output to the Low WSR is currently constrained by the header tanks at Goldstone). The current demand constraint is approximately 2.3Ml/d (PDO). If the	2031

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
		scheme is introduced, the constraint becomes pump capacity; scheme output is approximately 3.9Ml/d under severe drought conditions.	

Table 5-13 Visual evaluation matrix summary (post mitigation) for SBZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Sussex Brighton (SBZ)	Drought option -demand side (SBZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Sussex Brighton (SBZ)	Drought option - demand side (SBZ): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Sussex Brighton (SBZ)	Drought option - demand side (SBZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Sussex Brighton (SBZ)	Bulk import (SBZ): SEW to Rottingdean (20Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	0	-	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Sussex Brighton (SBZ)	Groundwater (SBZ): Lewes Road (3.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	-	-	0	0	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	-	0	0	--	0	0	-	-	0	0	0	0	0	0

Construction effects

No positive effects or likely significant positive effects were identified from the assessment of construction phase impacts for the preferred options.

No likely significant negative effects were identified from the assessment of construction phase impacts for the preferred options.

One option (Bulk import (SBZ): SEW to Rottingdean (20Ml/d)) was assessed as having potentially moderate negative effects on the Biodiversity SEA objective, associated with the potential for construction works to affect designated and/or non-designated habitats, species features and through direct land take, noise and/or disturbance (e.g. vibration, dust). The option would pass through Lewes Brooks SSSI. Measures such as realignment of the pipeline or use of trenchless techniques would help to avoid direct impacts on Lewes Brooks SSSI. More broadly, best practice methods will need to be implemented to minimise disturbance effects and habitat loss, with habitat to be reinstated on completion, or if unavoidable, compensatory habitat to be considered to replace damaged or lost habitat. All other negative construction effects for the preferred options were identified as minor.

Three options (Drought option -demand side (SBZ): NEUBs, Drought option - demand side (SBZ): Reduce transfer to other commercial customers and Drought option - demand side (SBZ): TUBs) were assessed as having neutral effects against all objectives for the construction phase as the nature of these options would involve operational changes only and no construction would be required for their implementation.

Operational effects

No likely significant positive effects were identified from the assessment of operation phase impacts for the preferred options.

All of the preferred options were assessed as having a positive effect against the Water - Reliability SEA objective during the operation phase, as the anticipated additional water yield or reduction in water demand would help to deliver reliable and resilient water supplies. The option Bulk import (SBZ): SEW to Rottingdean (20Ml/d) was assessed as having a moderate positive effect against this objective, with the remaining options assessed as having a minor positive effect.

Minor positive effects were identified against some of the other SEA objectives. Four of the preferred options were identified as having a positive effect on the Climate Change SEA objective. Two drought options (Drought option -demand side (SBZ): NEUBs, and Drought option - demand side (SBZ): TUBs) were identified as having minor positive effects across a wider range of the SEA objectives related to Biodiversity, Water - Quality and Reliability, Climatic Factors - Climate Change, Landscape, Historic Environment, Population & Human Health - Health & Wellbeing and Material Assets - Resource Use.

For Drought option -demand side (SBZ): NEUBs significant negative effects were identified for the Health & Wellbeing SEA objective in the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. Drought option - demand side (SBZ): TUBs was identified as having a moderate negative effect against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

No other significant negative effects were identified during the assessment of the operation phase of the preferred options, although moderate negative effects were determined for individual options against two other SEA objectives. Option Groundwater (SBZ): Lewes Road (3.5Ml/d) was considered to have a potential moderate negative effect against the Water - Quality SEA objective during operation, due to the potential for WFD non-compliance (low confidence) as the option aims to increase abstraction of water from the Brighton Chalk Block WFD groundwater body, which may impact groundwater levels and availability. Drought option:

NEUBs - SBZ was also identified as having a moderate negative effect against the Tourism & Recreation SEA objective through reducing the quantity of water made available for tourist attractions and water consuming recreational activities (swimming pools, watering sports pitches etc) during times of drought, which could dissuade tourists to the area for a brief period of time.

All other negative operation effects for the preferred options are identified as minor.

Interzonal transfer options

There aretwo interzonal transfer options within the Sussex Brighton WRZ (Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) and Interzonal transfer (SBZ-SWZ): Brighton to Worthing). As described in Section 5.4.2, these options would involve a transfer from the Sussex Worthing WRZ to the Sussex Brighton WRZ (for option Interzonal transfer (SBZ-SWZ): Brighton to Worthing, this would be bi-directional). A summary of these options is presented in Table 5-10 (Section 5.4.2), whilst a summary of the assessment of their effects (post mitigation) is set out in

Table 5-11 (Section 5.4.2); in order to avoid undue duplication, these tables are not repeated here.

Construction effects

As described in Section 5.4.2, for options Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) and Interzonal transfer (SBZ-SWZ): Brighton to Worthingno likely significant, moderate or minor positive effects were identified in the construction phase.

No significant negative effects were identified during the assessment of the construction phase. However, moderate negative effects were identified against the biodiversity SEA objective (for option Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) this is due to the pipeline route within the Sussex Brighton WRZ crossing the Adur Estuary SSSI, whilst for option Interzonal transfer (SBZ-SWZ): Brighton to Worthing (and the reverse) this was due to the pipeline route crossing the Stanmer Park/Coldean LNR and being adjacent to ancient woodland with associated potential for loss/disturbance (noise, dust, air quality) to this site and potential disturbance at others (although reduced/mitigated or potentially avoidable through mitigation/best practice). As described in section 5.4.2, all other effects were assessed as minor.

Operational effects

For options Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) and Interzonal transfer (SWZ-SBZ): Worthing to Brighton, no significant positive effects were assessed.

However, Interzonal transfer (SWZ-SBZ): Worthing to Brighton was assessed as having a moderate positive effect against the water reliability SEA objective, which is attributed to the volume of the transfer and associated positive effect on water resource resilience (in both the Sussex Brighton and Sussex Worthing WRZs).

No significant negative effects were identified.

5.5 Western area

5.5.1 Hampshire Kingsclere (HKZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-14, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-15.

Table 5-14 Summary of options for HKZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (HKZ): NEUBs	0.26	Non-essential use ban - HKZ WRZ.	2035
Drought option - demand side (HKZ): TUBs	0.17	Temporary use bans - HKZ WRZ.	2035
Groundwater (HKZ): Remove constraints at Newbury to increase yield (1.2Ml/d)	1.2	The scheme is located within the Hampshire Kingsclere resource group (which consists of and is served by Kingsclere and East Woodhay WSWs). The scheme will increase the yield of the East Woodhay source within the existing licence by removing the present constraint imposed by mains leaving the site. This option will involve the construction of a dedicated, 7.1 km 300mm DN300 pipe from East Woodhay water supply works (WSW) and additional pumps and treatment facilities to increase the supply to Beacon Hill WSR. Additional high-lift pumping capacity would be required at East Woodhay. East Woodhay WSW abstracts water from the underlying chalk aquifer. It is considered that the River Enbourne will not be affected by the increased abstractions due to its perched nature above the London Clay.	2028

Table 5-15 Visual evaluation matrix summary (post mitigation) for HKZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Kingsclere (HKZ)	Drought option - demand side (HKZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Hampshire Kingsclere (HKZ)	Drought option - demand side (HKZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Hampshire Kingsclere (HKZ)	Groundwater (HKZ): Remove constraints at Newbury to increase yield (1.2Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	0	-	0	0	-	-	0	--	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	-	0	0	-	-	0	0	0	0	0	0

Construction effects

None of the threeoptions were identified as having significant positive or negative effects during their respective construction phases. No positive effects were identified for any of the options within the construction phase.

Two options (Drought option - demand side (HKZ): NEUBs and Drought option - demand side (HKZ): TUBs) were also assessed as having no negative effects during the construction phase, as they would involve no construction and would involve operational changes only.

The remaining option, Groundwater (HKZ): Remove constraints at Newbury to increase yield (1.2Ml/d), has been assessed as having a moderate negative effect against the biodiversity and landscape SEA objectives. A moderate negative effect has been assessed against the biodiversity SEA objective associated with the potential for construction works to affect designated and/or non-designated habitats, species and features and ancient woodland through noise and/or disturbance (e.g. vibration, dust). The option would be within close proximity to Highclere Park SSSI and Burghclere Beacon SSSI, and would cross SSSI impact risk zones where pipeline development is highlighted as being a risk to the sensitive features for which the SSSI's are notified. The route also passes through ancient woodland. However, measures to minimise impacts and careful routing, is likely to reduce or avoid the potential impacts on these features. The option would also lie entirely within the North Wessex Downs National Landscape and would have temporary negative effects on landscape character during the construction phase, therefore a moderate negative effect has been assessed against the landscape SEA objective.

No other significant or moderate negative effects were identified during the assessment of the construction phase of the options; however, a range of minor negative effects were identified against the water resilience, air, carbon emissions, historic environment, health and wellbeing, tourism and recreation, resource use and built asset SEA objectives forGroundwater (HKZ): Remove constraints at Newbury to increase yield (1.2Ml/d).

Operational effects

No significant positive effects were identified during assessment of the three options for the operational phase. However, a range of minor positive effects were identified against the biodiversity, water quality, water reliability, carbon emissions, climate change, landscape, historic environment, health and wellbeing, and resource use SEA objectives.

For Drought option - demand side (HKZ): NEUBs, significant negative effects were identified for the health and wellbeing SEA objective during the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ.

No other significant negative effects were identified during the assessment of the operational phase of the options; however, a range of minor and moderate negative effects were identified against the soils, geodiversity, land use, water reliability, carbon emissions, climate change, landscape, historic environment, health and wellbeing, and tourism and recreation SEA objectives.

Interzonal transfer options

There is one interzonal transfer option (Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d)) within the Hampshire Kingsclere Zone. For this option the Hampshire Andover WRZ would be the source zone, whilst the Hampshire Kingsclere WRZ would be the recipient zone (however, it is noted that this transfer is reversible/bi-directional). This option includes consideration of Bulk import (HAZ): T2ST to Andover (20Mld) and Bulk import (HKZ): T2ST to HKZ (5Ml/d). Essentially, two pipelines will be required to deliver Bulk import (HAZ): T2ST to Andover (20Mld) and Bulk import (HKZ): T2ST to HKZ (5Ml/d), with Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) (this option) then utilising both of these for bi-directional distribution. A summary of this option is presented in Table 5-18 (Section 5.5.2), whilst

a summary of the assessment of its effects (post mitigation) is set out in Table 5-19 (Section 5.5.2); in order to avoid undue duplication, these tables are not repeated here.

Construction effects

As described in Section 5.5.2, for Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) no significant, moderate or minor positive effects were identified.

No significant negative effects were identified during the assessment of the construction phase. It is noted that a moderate negative effect was assessed against the landscape SEA objective, due to much of the works being situated within the North Wessex Downs National Landscape (although effects are not expected to be significant when accounting for mitigation (temporary screening), including sections within the Hampshire Kingsclere WRZ.

Operational effects

As described in Section 5.5.2 for Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) no significant positive effects or significant negative effects were identified in the assessment of the operational phase.

5.5.2 Hampshire Andover (HAZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-16, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-17.

Table 5-16 Summary of options for HAZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (HAZ): NEUBs	0.9	Non-essential use ban - HAZ WRZ.	2029
Drought option - demand side (HAZ): Reduce transfer to other commercial customers	0.03	Drought option: In the event of a drought, the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2029
Drought option - demand side (HAZ): TUBs	0.56	Temporary use bans - HAZ WRZ.	2029
Groundwater (HAZ): Recommissi on Chilbolton (0.5Ml/d)	0.5	Chilbolton WSW, a groundwater source, was decommissioned in 2011 due to high nitrate concerns. The boreholes and booster pumps to move water through the site are the only remaining assets on site. A catchment management solution is currently being progressed to allow the site to return to service by 2035.	2073

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
		The site can be brought back into service earlier by installing nitrate treatment. There is no run to waste facility at the site and waste will need to be transferred to a suitable WwTW and discharged under existing consents. Nitrate waste stream to be disposed of by tankering. The site can provide up to 0.49Ml/d with an expected delivery by 2029-30. It will also need a connection with HSW to offset the use of drought permits/orders in Hampshire. The option provides limited benefit but requires considerable infrastructure improvements.	

Table 5-17 Visual evaluation matrix summary (post mitigation) for HAZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Andover (HAZ)	Drought option - demand side (HAZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Hampshire Andover (HAZ)	Drought option - demand side (HAZ): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Hampshire Andover (HAZ)	Drought option - demand side (HAZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Hampshire Andover (HAZ)	Groundwater (HAZ): Recommission Chilbolton (0.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	-	0	0	0	-	-	0	-	-	-	-	--	0
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	-	0	-	-	-	-	-	-	0	0	0

Construction effects

None of the fouroptions were identified as having significant positive or negative effects during their respective construction phases. No positive effects were identified for any of the options within the construction phase.

Three options (Drought option - demand side (HAZ): NEUBs, Drought option - demand side (HAZ): Reduce transfer to other commercial customers, and Drought option - demand side (HAZ): TUBs) wereassessed as having no negative effects during the construction phase, as they would involve no construction and would involve operational changes only.

One option (Groundwater (HAZ): Recommission Chilbolton (0.5Ml/d)), has been assessed as having one moderate negative effect against the resource use SEA objective for the construction phase. Minor negative effects were also identified for this optionagainst thesoils, air, carbon emissions, landscape, historic environment, health and wellbeing, and tourism and recreation, SEA objectives.

Operational effects

No significant positive effects were identified during assessment of the four options for the operational phase. However, a range of minor positive effects were identified against the biodiversity, water quality, water reliability, carbon emissions, climate change, landscape, historic environment, health and wellbeing, and resource use SEA objectives.

For Drought option - demand side (HAZ): NEUBs, significant negative effects were identified for the health and wellbeing SEA objective during the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ.

No other significant negative effects were identified during the assessment of the operational phase of the options; however, a range of minor and moderate negative effects were identified against the soils, geodiversity, land use, water quality, water reliability, air, carbon emissions, climate change, landscape, historic environment, health and wellbeing, and tourism and recreation SEA objectives.

Interzonal transfer options

There are two interzonal transfer options within the Hampshire Andover WRZ. For Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d), the Hampshire Winchester WRZ would be the source zone, whilst the Hampshire Andover WRZ would be the recipient zone. A summary of this option is presented in Table 5-28 (Section 5.5.5), whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-29 (Section 5.5.5); in order to avoid undue duplication, these tables are not repeated here.

For Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) the Hampshire Andover WRZ would be the source zone, whilst the Hampshire Kingsclere WRZ would be the recipient zone (however, it is noted that this transfer is reversible/bi-directional). This option includes consideration of Bulk import (HAZ): T2ST to Andover (20Mld) and Bulk import (HKZ): T2ST to HKZ (5Ml/d). Essentially, two pipelines will be required to deliver Bulk import (HAZ): T2ST to Andover (20Mld) and Bulk import (HKZ): T2ST to HKZ (5Ml/d), with Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) (this option) then utilising both of these for bi-directional distribution. This option is described in Table 5-18 below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-19 below.

Table 5-18 Summary of interzonal options for HAZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) (Includes consideration of Bulk import (HAZ): T2ST to Andover (20Ml/d) and Bulk import (HKZ): T2ST to HKZ (5Ml/d))	6.81	Transfer from Otterbourne to Andover to Kingsclere. This scheme is designed to support network improvements needed for UTMRD transfer to Hampshire and/or the strategic scheme from IOW/South Hampshire. This option includes consideration of Bulk import (HAZ): T2ST to Andover (20Mld) and Bulk import (HKZ): T2ST to HKZ (5Ml/d). Essentially, two pipelines will be required to deliver Bulk import (HAZ): T2ST to Andover (20Mld) and Bulk import (HKZ): T2ST to HKZ (5Ml/d), with Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) (this option) then utilising both of these for bi-directional distribution.	2050

Table 5-19 Visual evaluation matrix summary (post mitigation) for HAZ interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Hampshire Andover (HAZ)	Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) (Includes consideration of Bulk import (HAZ): T2ST to Andover (20Ml/d) and Bulk import (HKZ): T2ST to HKZ (5Ml/d))	Construction (negative)	-	0	-	0	0	-	-	0	--	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0

Construction effects

As described in Section 5.5.5 for option Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) no likely significant positive effects or significant negative effects were identified in the assessment of the construction phase.

Similarly for option Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) no significant positive effects or significant negative effects were identified during the assessment of the construction phase. However, a moderate negative effect was assessed against the landscape SEA objective, due to much of the works being partially situated within the North Wessex Downs National Landscape (although effects are not expected to be significant when accounting for mitigation (temporary screening), including sections within the Hampshire Andover WRZ. Minor negative effects were identified against the biodiversity, water resilience, air, carbon emissions, historic environment, health & wellbeing, tourism & recreation, resource use and built assets SEA objectives.

Operational effects

As described in Section 5.5.5 for Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) no likely significant positive effects or likely significant negative effects were identified in the assessment of the operational phase.

Similarly, for Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) no likely significant positive effects or likely significant negative effects were identified in the assessment of the operational phase, with only a minor positive effect against the water reliability SEA objective and minor negative effect against the carbon emissions SEA objective being identified in the assessment.

5.5.3 Isle of Wight (IOW) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-20, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-21.

Table 5-20 Summary of options for IOW.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - supply side (IOW): Caul Bourne (1.5Ml/d)	1.5 Ml/d	Caul Bourne reduce MRF	2037
Drought option - demand side (IOW): NEUBs	3.08	Non-essential use ban - IOW WRZ	2026
Drought option - demand side (IOW): Reduce transfer to other commercial customers	0.07	Drought option: In the event of a drought, the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027
Drought option - demand side (IOW): TUBs	1.93	Temporary use bans - IOW WRZ	2026
Groundwater (IOW): New boreholes at Newchurch (LGS) (1.9Ml/d)	1.95	This option proposes replacing all 3 Lower Greensand boreholes on site so that the source can operate to its licenced capacity. Currently BH4 is non-operational, BH1 and BH2 are operational but at reduced capacity due to screen-dewatering. No additional treatment is proposed. Total Scheme output would be 4.5Ml/d.	2037
Groundwater (IOW): New borehole at Eastern Yar3 (1.5Ml/d)	1.5 Ml/d	The option is to drill a new replacement borehole, 100m deep, for Lessland Lane Augmentation well on the Isle of Wight. The existing borehole has experienced around a 90%+ loss in performance, and previous well rehabilitation and cleaning has not provided a notable improvement. A replacement well is required to regain resilience within the well field for the river augmentation scheme.	2040

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Recycling (IOW): Sandown (8.5Ml/d)	8.5	This option proposes the transfer of treated effluent from Sandown WwTW (currently discharged to sea), to support flows in the Eastern River Yar upstream of the Sandown WSW abstraction at Burnt House. Treated water in excess of the local demand will be transferred through a new transfer pipeline to a service reservoir near Newport, for supply to much of the island. This option is reliant on the WSR enlargements carried out in IZT_CSM Cross-Solent upgrade. (2) Option 2 also includes upgrades to Sandown WSW to achieve the extra flow.	2031

Table 5-21 Visual evaluation matrix summary (post mitigation) for IOW.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Isle of Wight (IOW)	Drought option - supply side (IOW): Caul Bourne (1.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	+	+	0	0
		Operation (negative)	---/?	0	0	---	0	0	-	-	-	0	0	0	0	0
Isle of Wight (IOW)	Drought option - demand side (IOW): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Isle of Wight (IOW)	Drought option - demand side (IOW): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0

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WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Isle of Wight (IOW)	Drought option - demand side (IOW): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Isle of Wight (IOW)	Groundwater (IOW): New boreholes at Newchurch (LGS) (1.9Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	0	0	0	-	-	0	-	0	-	0	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	-	0	0	--	0	0	-	-	0	0	0	0	0	0
Isle of Wight (IOW)	Groundwater (IOW): New borehole at Eastern Yar3 (1.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	0	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0

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WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	0	0	0	-	0	0	-	0	0	0	0	0	0	0
Isle of Wight (IOW)	Recycling (IOW): Sandown (8.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	+	+	0	0	+	0	0	0	0	+	0
		Operation (negative)	-	0	0	--	0	0	-	0	0	0	0	0	0	0

Construction effects

None of theseven options were identified as having positive or likely significant positive effects during their respective construction phases.

Four options (Drought option - supply side (IOW): Caul Bourne (1.5Ml/d), Drought option - demand side (IOW): NEUBs, Drought option - demand side (IOW): Reduce transfer to other commercial customers, and Drought option - demand side (IOW): TUBs) were assessed as having neutral effects, as they would involve no construction and would involve operational changes only.

None of the five options were identified as having significant negative effects during their respective construction phases

Three options (Groundwater (IOW): New borehole at Eastern Yar3 (1.5Ml/d), Groundwater (IOW): New boreholes at Newchurch (LGS) (1.9Ml/d), and Recycling (IOW): Sandown (8.5Ml/d)) have been assessed as having a varying range of minor negative effects against the biodiversity, soils, geodiversity and land use, water resilience, air, carbon emissions, landscape, historic environment, health and wellbeing, tourism and recreation, resource use and built asset SEA objectives during the construction phase.

All three of these options were assessed as having a negative or potentially negative effect on the biodiversity SEA objective, associated with the potential for construction works to affect designated and/or non-designated habitats, species and features through either direct land take, noise and/or disturbance (e.g. vibration, dust). Recycling (IOW): Sandown (8.5Ml/d) was assessed as having a moderate negative effect against the biodiversity SEA objective during construction as the option would be within close proximity to America Wood SSSI and Lake Allotments SSSI, and would cross SSSI impact risk zones associated with Alverstone Marshes SSSI, America Wood SSSI, Bembridge Down SSSI and Brading Marshes to St. Helen's Ledges SSSI including areas where pipeline development is highlighted as being a risk to the sensitive features for which the SSSI's are notified. With regards to European sites, the HRA found that construction adverse effects will not occur or are almost certainly avoidable.

Operational effects

No significant positive effects were identified during assessment of the seven options for the operational phase. However, a varying range of minor positive effects were identified against the biodiversity, water quality, water reliability, carbon emissions, climate change, landscape, historic environment, health and wellbeing, tourism and recreation, and resource use SEA objectives during operation.

Drought option - supply side (IOW): Caul Bourne (1.5Ml/d), has been assessed as having a significant negative uncertain effect on the biodiversity SEA Objective. The HRA Appropriate Assessment of this option, as reported in the Drought Plan SEA, identified potential adverse impacts on the Solent Maritime SAC, Solent and Southampton Water SPA and Ramsar. The Drought Permit has the potential to affect the Newtown estuary component of these European sites only, and specifically the Shalfleet Creek system of the estuary which receives freshwater flow inputs from the Caul Bourne river. Flows in the Caul Bourne may be reduced as a consequence of the Drought Permit, leading to a change in the freshwater flows to the Shalfleet Creek. Uncertainty in these conclusions will be addressed through a Monitoring and Mitigation Package being developed in consultation with Natural England and Environment Agency. Minor impacts are considered likely to the Isle of Wight Downs SAC and Yarmouth to Cowes Marine Conservation Zone during operation of Drought option - supply side (IOW): Caul Bourne (1.5Ml/d).

For Drought option - demand side (IOW): NEUBs, significant negative effects were identified for the health and wellbeing SEA objective during the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. Drought option - demand side (IOW): TUBs was identified as having moderate negative effects against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

A significant negative effect was identified against the Water Quality SEA objective for Drought option - supply side (IOW): Caul Bourne (1.5Ml/d), in line with the SEA and WFD (2025) for the Southern Water Drought Plan 2022. The WFD assessment (2025) of the Southern Water Drought Plan 2022 highlights that with regard to the IOW Central Downs Chalk groundwater body, there is a medium risk of temporary deterioration in quantitative status and low risk for chemical status (within class) and that there are surface water bodies that will be potentially impacted (Caul Bourne waterbody and Newtown River transitional waterbody). The Drought Plan WFD highlights that with regard to the Caul Bourne waterbody and the Newtown River transitional waterbody, there is a high risk of temporary deterioration in status due to impacts on the fish community and there are potential risks to Solent and Southampton Water SPA Solent Maritime SAC. The SEA assessment (2025) of the Southern Water Drought Plan 2022, highlights that the implementation of the drought permit would result in a major adverse impact on groundwater levels and flows in the Caul Bourne and freshwater flow inputs to the Newtown Estuary. There would be an associated moderate adverse impact on water quality and ecology in the Caul Bourne.

For Groundwater (IOW): New boreholes at Newchurch (LGS) (1.9Ml/d) and Recycling (IOW): Sandown (8.5Ml/d) moderate effects in the operation phase were identified for the Water Quality SEA objective linked to the findings of the WFD (2025) assessment which identified WFD non-compliance (with low confidence) in relation to the Eastern Yar (Lower) and IOW Lower Greensand (in respect of Groundwater (IOW): New boreholes at Newchurch (LGS) (1.9Ml/d));and, the Eastern Yar (lower) (in respect of Recycling (IOW): Sandown (8.5Ml/d)). For Groundwater (IOW): New borehole at Eastern Yar3 (1.5Ml/d) a minor negative effect was identified, given that the WFD Stage 2 assessment concluded that the option would be WFD compliant, with low confidence.

Drought option - demand side (IOW): NEUBs was identified as having a moderate negative effect against the population & human health - tourism & recreation SEA objective through reducing the quantity of water made available for tourist attractions and water consuming recreational activities (swimming pools, watering sports pitches etc) during times of drought, which could dissuade tourists to the area for a brief period of time.

All other negative operational effects for these options were identified as minor.

5.5.4 Hampshire Rural (HRZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-22, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-23.

Table 5-22 Summary of options for HRZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (HRZ): NEUBs	0.37	Non-essential use ban - HRZ WRZ.	2026
Drought option - demand side (HRZ): TUBs	0.23	Temporary use bans - HRZ WRZ.	2026
Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d)	4.8	The existing boreholes and well/adits that supply Timsbury WSW are either out of service or operating below their full capacity due to water quality issues. This option proposes 3 replacement boreholes to increase and recover DO on site. Total source output on delivery of the scheme would be 13.7Ml/d. No additional treatment is required. Replacement borehole locations are distant from existing borehole locations and require new pipelines to connect to the WSW.	2031
Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d)	2.5	This option involves recovering DO through the development of a new borehole and pump capacity to increase the yield from the current 1.5Ml/d to the licenced capacity of 4Ml/d providing a net benefit of 2.5Ml/d. The network is also being reviewed to ensure there are no capacity constraints.	2031

Table 5-23 Visual evaluation matrix summary (post mitigation) for HRZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Rural (HRZ)	Drought option - demand side (HRZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Hampshire Rural (HRZ)	Drought option - demand side (HRZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Hampshire Rural (HRZ)	Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	0	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	-	0	0	-	0	0	-	-	-	0	0	0	0	0
Hampshire Rural (HRZ)	Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	---	-	0	-	-	0	-	-	0	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	-	-	0	-	0	0	-	-	-	-	0	-	0	0

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Construction effects

No positive effects or significant positive effects were identified within the construction phase for any of the options. No negative effects were identified for Drought option - demand side (HRZ): NEUBs and Drought option - demand side (HRZ): TUBs. One significant negative effect was identified for Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d) against the water resilience SEA objective. This is due to the whole site being located within Flood Zones 2 and 3 therefore the construction works will be at high risk of flooding.

Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d) was assessed as having minor negative effects against the biodiversity, soils, geodiversity and land use, air, carbon emissions, landscape, historic environment, health and wellbeing, tourism and recreation, resource use and built asset SEA objectives reflecting the location of the option in relation to various designated assets, the scale of construction works and expected use of resources. Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d) was assessed as having minor negative effects against the soils, water quality, air, carbon emissions, landscape, historic environment, tourism and recreation, resource use and built asset SEA objectives.

The remaining options (Drought option - demand side (HRZ): NEUBs and Drought option - demand side (HRZ): TUBs) were also assessed as having neutral effects during the construction phase, as they would involve operational changes only.

Operational effects

No significant positive effects were identified during assessment of the four options for the operation phase. However, a range of minor positive effects were identified against the biodiversity, water quality, water reliability, carbon emissions, climate change, landscape, historic environment, health and wellbeing, and resource use SEA objectives.

For Drought option - demand side (HRZ): NEUBs, significant negative effects were identified for the health and wellbeing SEA objective during the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. The Drought option - demand side (HRZ): TUBs was identified as having a moderate negative effect against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

No other significant negative effects were identified during the assessment of the operational phase of the options. However, a range of minor effects were identified against the biodiversity, soils, geodiversity, land use, water quality, carbon emissions, climate change, landscape, historic environment, and tourism and recreation SEA objectives.

Interzonal transfer options

There are two interzonal transfer options (Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) and Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d))) within the Hampshire Rural WRZ. These options would enable bi-directional transfers between the Hampshire Southampton West WRZ and the Hampshire Rural WRZ. A summary of Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) is presented in Table 5-36 (Section 5.5.7), whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-37 (Section 5.5.7); in order to avoid undue duplication, these tables are not repeated here.

A summary of Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) is presented in in Table 5-Table 5-26, whilst a summary of the assessment of effects (post mitigation) is set out inTable 5-25.

Table 5-24 Summary of interzonal options for HRZ

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d)	5	Development and upgrade of existing transfer between Romsey Town & Broadlands valve (HSW-HRZ). This option involves installing a new booster station with 5Ml/d flow capacity to an existing transfer to allow bi-directional flow.	2031

Table 5-25 Visual evaluation matrix summary (post mitigation) for HRZ interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Southampton West (HSW)	Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	-	0	0	0	-	0	-	0	0	0	-	0
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	-	0	0	0	-	0	0	0	0	0	0	0

Construction effects

For Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) no likely significant positive effects or likely significant negative effects were identified during the assessment of the construction phase. However, minor negative effects were identified against the biodiversity, water resilience, carbon emissions, landscape, and resource use SEA objectives.

As described in Section 5.5.7, for Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d), no likely significant positive effects or likely significant negative effects were identified during the assessment of the construction phase, with only minor negative effects identified.

Operational effects

For Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d), a minor positive effect was identified against the water reliability SEA objective, whilst minor negative effects were identified against the water resilience and carbon emissions SEA objectives, during the operational phase.

As described in Section 5.5.7 for Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d), no likely significant positive effects or likely significant negative effects were identified in the assessment of the operational phase, with only minor effects identified.

5.5.5 Hampshire Winchester (HWZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-26Table 5-26, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-27.

Table 5-26 Summary of options for HWZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (HWZ): NEUBs	0.99	Non-essential use ban - HWZ WRZ.	2029
Drought option - demand side (HWZ): Reduce transfer to other commercial customers	0.05	Drought option: In the event of a drought, the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2029
Drought option - demand side (HWZ): TUBs	1.93	Temporary use bans - HWZ WRZ.	2029
Bulk import (HWZ): T2ST to Yew Hill (95Ml/d)	94.83	This is the main pipeline for the bulk transfer of water from Thames Water (the Thames to Southern Transfer scheme (T2ST)), with volumes essentially derived through delivery of the South East Strategic Reservoir Option (SESRO) by Thames Water.	2040

Table 5-27 Visual evaluation matrix summary (post mitigation) for HWZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Winchester (HWZ)	Drought option - demand side (HWZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Hampshire Winchester (HWZ)	Drought option - demand side (HWZ): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Hampshire Winchester (HWZ)	Drought option - demand side (HWZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Hampshire Winchester (HWZ)	Bulk import (HWZ): T2ST to Yew Hill (95Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+++	0	0	+	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0

Construction effects

For Drought option - demand side (HWZ): NEUBs, Drought option - demand side (HWZ): Reduce transfer to other commercial customers and Drought option - demand side (HWZ): TUBs, for construction, all objectives were assessed as neutralas no construction is required in order to implement use of water reduction methods during periods of drought.

ForBulk import (HWZ): T2ST to Yew Hill (95Ml/d) no significant, moderate or minor positive effects were identified in the assessment of the construction phase.

No significant negative effects were identified in the assessment of the construction phase of Bulk import (HWZ): T2ST to Yew Hill (95Ml/d). However, minor negative effects were identified for all three options against the air, carbon emissions, landscape, historic environment, health & wellbeing, tourism & recreation, resource use and built assets SEA objectives.

Operational effects

In operation, a significant positive effect was identified against the water reliability SEA Objective for Bulk import (HWZ): T2ST to Yew Hill (95Ml/d), as the scheme will significantly improve water transfer across regions, improving water resource management and resilience of supply. The option was also assessed as having a minor positive effect on climate change resilience.

The remaining three options were assessed as having a minor positive effect against SEA objectives related to biodiversity, water quality and reliability, climatic factors - climate change, landscape, historic environment, population & human health - health & well-being and material assets - resource use. Two of the options (Drought option - demand side (HWZ): NEUBs and Drought option - demand side (HWZ): TUBs) were also identified as having positive effects against the climatic factors - carbon emissions SEA objective.

Positive effects were identified for the options as they will help to reduce the demand for water during times of drought through encouraging customers to use less water using hosepipe bans.

For Drought option - demand side (HWZ): NEUBs significant negative effects were identified for the Health and wellbeing SEA objective in the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. This is the only significant negative effect associated with any of the options. Drought option - demand side (HWZ): TUBs was identified as having a moderate negative effect against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water based on the temporary use ban powers. Drought option - demand side (HWZ): Reduce transfer to other commercial customers scored as having a minor negative effect against this SEA objective due to the reasons identified for the other options but noting that the potential for this option to provide negative effects is considerably more constrained.

Drought option - demand side (HWZ): NEUBs was assessed as having a minor negative effect against the soils, geodiversity, land use SEA objective due to it potentially making it harder to manage soils during periods of drought by limiting the amount of water that could be used for such purposes.

Drought option - demand side (HWZ): Reduce transfer to other commercial customers scored a minor negative against the water - reliability SEA objective, due to potentially reducing the supply of water to consumer customers, potentially compromising the reliability of the supply of water to such customers.

Bulk import (HWZ): T2ST to Yew Hill (95Ml/d) was assessed as having a minor negative effect on carbon emissions during operation, due to estimated minor operational emissions.

Two options (Drought option - demand side (HWZ): NEUBs and Drought option - demand side (HWZ): TUBs) were assessed as having a minor negative effect against the landscape and historic environment SEA objectives due to potentially limiting the amount of water available to water gardens and grounds that are important to local landscapes and some heritage assets.

Three of the options were identified as having either a moderate negative effect (Drought option - demand side (HWZ): NEUBs) or minor negative effect (Drought option - demand side (HWZ): Reduce transfer to other commercial customers and Drought option - demand side (HWZ): TUBs) against the population & human health - tourism & recreation SEA objective through reducing the quantity of water made available for tourist attractions and water consuming recreational activities (swimming pools, watering sports pitches etc) during times of drought, which could dissuade tourists to the area for a brief period of time.

Interzonal transfer options

Thereare three interzonal transfer options within the Hampshire Winchester WRZ (Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d), Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) and Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d)).

For Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) the Hampshire Winchester WRZ would be the source zone, whilst the Hampshire Andover WRZ would be the recipient zone. This option is described in Table 5-28 below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-29 below.

For Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) the Hampshire Southampton East WRZ would be the source zone, whilst the Hampshire Winchester WRZ would be the recipient zone, however, it is bi-directional. This option is described in Table 5-32 (Section 5.5.6) below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-33 (Section 5.5.6) below; in order to avoid undue duplication, these tables are not repeated here.

For Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) the Hampshire Winchester WRZ would be the source zone, whilst the Hampshire Southampton West WRZ would be the recipient zone, however, it is bi-directional. This option is described in Table 5-36 (Section 5.5.7) below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-37Table 5-37 (Section 5.5.7) below; in order to avoid undue duplication, these tables are not repeated here.

Table 5-28 Summary of interzonal options for HWZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d)	10.62	Transfer from Otterbourne to Andover to Kingsclere. This scheme is designed to support network improvements and/or the strategic scheme from IoW/South Hampshire.	2031

Table 5-29 Visual evaluation matrix summary (post mitigation) for HWZ interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Winchester (HWZ)	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0

Construction effects

As described in Section 5.5.6 for Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d), no likely significant positive or likely significant negative effects were identified in the assessment of the construction phase.

As described in Section 5.5.7 for Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) no likely significant positive effects and no likely significant negative effects were identified in the assessment of the construction phase. Moderate negative effects were identified for this option against the soils, geodiversity and land use, water resilience, carbon emissions and resource use SEA objectives.

For Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d), no likely significant positive effects or likely significant negative effects were identified during the assessment of the construction phase. However, a moderate negative effect was assessed against the biodiversity SEA objective. This is due to the pipeline route within the Hampshire Winchester Zone crossing the crosses the River Test SSSI and the Bransbury Common SSSI and associated potential for loss/disturbance (noise, dust, air quality) to these sites and potential disturbance at others (although reduced/avoided through mitigation/best practice).

Across the three options a range of minor negative effects were also identified against the biodiversity, soils, geodiversity and land use, water resilience, water quality, air, carbon emissions, landscape, historic environment, health & wellbeing, tourism & recreation, resource use and built assets SEA objectives.

Operational effects

As described in Section 5.5.6 for Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74 Ml/d) and as described in Section 5.5.7 for Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d), significant positive effects were identified against the water reliability SEA objective for both of these options, reflecting the significant transfer capacity that they would provide. No further significant positive effects were identified in the assessment of these options, with only minor positive effects identified against the climate change and health and wellbeing SEA Objectives for Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d).

For Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) no significant positive effects were identified in the assessment of the operational phase, with only a minor positive effect against the water reliability SEA objective

No significant negative or significant negative effects were identified in the assessment of the operational phase of any of the three options.

For all three options, a minor negative effect was identified against the carbon emissions SEA objective, whilst for Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74 Ml/d) a minor negative effect was also identified against the biodiversity SEA objective and for Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d), minor negative effects were identified against the water quality and landscape SEA objectives.

5.5.6 Hampshire Southampton East (HSE) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-30Table , whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-31.

Table 5-30 Summary of options for HSE.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest ear of implementation
Drought option - supply side (HSE): Candover (22Ml/d)	21.96	To allow up to 27Ml/d and 3750Ml/year (average of 20.8Ml/d over 6 months) to be abstracted from the Preston Candover boreholes. Abstraction would be increased over a period of several days up to the full required discharge rate so as to prevent a sudden increase in flow in the River Itchen. Abstraction and discharges will only be permitted when flows in the River Itchen at Allbrook and Highbridge are at or below a trigger flow of 220Ml/d. 2Ml/d environmental support (within the limits above) at the existing discharge to the Candover Stream. Operated during, and potentially after, discharges to the River Itchen.	2026
Drought option - demand side (HSE): NEUBs	5.41	Non-essential use ban - HSE WRZ	2026
Drought option - supply side (HSE): Lower Itchen	27.89	Drought Order to reduce the proposed abstraction licence 'hands off' flow condition from 198Ml/d to 160Ml/d, as measured at Allbrook and Highbridge gauging station and Drought Order to reduce the 'hands off' flow condition from 194Ml/d to 150Ml/d, as measured at Portsmouth Water's Lower Itchen abstraction licence gauging station.	2026
Drought option - demand side (HSE): Reduce transfer to other commercial customers	0.2	Drought option: In the event of a drought, the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027
Drought option - demand side (HSE): TUBs	3.38	Temporary use bans - HSE WRZ	2026

Option name	Yield (Ml/d) (if applicable)	Description	Earliest ear of implementation
Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d)	21	A new additional potable water transfer of 21Ml/d capacity using a new pipeline from Portsmouth Water Source A to Otterbourne. This scheme is dependent on development of Havant Thicket reservoir to provide the water.	2032
Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d)	90	A new raw water transfer (Pumping Station, Pipeline & Break Pressure tank) between Havant Thicket Reservoir and Otterbourne WSW. The capacity of the first section is for 90Ml/d to the mid-point and a possible connection to Portsmouth Water.	2035
Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d)	60	60Ml/d of recycled water will be sent to Otterbourne via Havant Thicket Reservoir. Budds Farm WWTW transfer to new Water Recycling Plant then transfer to Havant Thicket. Direct raw water transfer from Havant Thicket to Otterbourne for treatment.	2035

Table 5-31 Visual evaluation matrix summary (post mitigation) for HSE.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Southampton East (HSE)	Drought option - supply side (HSE): Candover (22Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	-	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	---/?	0	0	--	0	0	-	-	0	0	0	0	0	0
Hampshire Southampton East (HSE)	Drought option - demand side (HSE): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
	Drought option - supply side (HSE): Lower Itchen	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Southampton East (HSE)		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	++ +	0	0	0
		Operation (negative)	---/?	0	0	--	0	0	0	-	-	0	0	0	-	0
Hampshire Southampton East (HSE)	Drought option - demand side (HSE): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Hampshire Southampton East (HSE)	Drought option - demand side (HSE): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Hampshire Southampton East (HSE)	Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	-	-	0	-	-	0	-	--	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Hampshire Southampton East (HSE)	Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+++	0	0	0	0	0	0	0	0	0
		Operation (negative)	-	0	0	0	0	0	--	0	0	0	0	0	0	0
	Recycling (HSE): Recharge of Havant Thicket from	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Southampton East (HSE)	recycled water from Budds Farm (60Ml/d)	Construction (negative)	--	0	-	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+++	0	0	+	0	0	0	0	0	0
		Operation (negative)	-	0	-	0	0	0	-	-	-	0	0	0	0	0

Construction effects

None of the options were identified as having positive or significant positive effects during their respective construction phases.

No significant negative effects were identified for any of the options within the construction phase.

Three of the preferred options requiring construction were assessed as having a negative or potentially negative effect on the biodiversity SEA objective, associated with the potential for construction works to affect designated and/or non-designated habitats, species and features through either direct land take, noise and/or disturbance. Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) was assessed as having moderate negative effects against the biodiversity SEA objective reflecting the option location partially within the River Itchen SSSI and proximity to five other SSSIs and ancient woodland. However, measures to minimise impacts and reinstatement/compensation, and careful routing, is likely to reduce or avoid the potential impacts on these features. With regards to Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) moderate negative effects were assessed in relation to the proximity to Langstone Harbour SSSI, ancient woodland, Solent Maritime SAC and Chichester and Langstone Spa and Ramsar. The HRA concluded that the mitigation measures identified through the SRO gated process undertaken for the option provides certainty that there will be no adverse effects. Mitigation measures and careful routing will reduce or avoid impacts on the SSSI and ancient woodland.

Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d) was assessed as having a moderate negative effect against the historic environment SEA objective. This is due to this option being in close proximity to several listed buildings and Scheduled Monuments and Conservation Areas, alongside potentially compromising yet undiscovered archaeological assets. Option routing should be considered to avoid heritage assets, where possible. Best practice measures will likely be implemented to minimise effects on setting during construction.

No other significant or moderate negative effects were identified during the assessment of the construction phase of the options; however, a range of minor negative effects were identified against the biodiversity, soils, geodiversity, land use, water resilience, water quality, air, carbon emissions, landscape, historic environment, health and wellbeing, tourism and recreation, resource use and built asset SEA objectives.

Operational effects

Two of the options (Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) and Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d)) were identified as having significant positive effects on the water reliability SEA objective. This relates to the creation of a new raw water transfer station and pipeline, which would provide more water to consumers in a reliable manner (for Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d). Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) was also assessed as having a significant positive effect attributed to the scale of the anticipated additional water yield (60 Ml/d) that would be provided by treating final effluent from Budds Farm WTW to a very high standard and using this recycled water to recharge Havant Thicket Reservoir during the operation of this option. A moderate positive effect was assessed against this objective for option Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d), as the option will facilitate water supply through an additional bulk import.

Drought option - supply side (HSE): Lower Itchen) was assessed as having a significant positive effect against the health and wellbeing SEA objective. This is due to the option providing drought permits that would provide additional yield, helping to maintain essential public water supplies during drought conditions, and would therefore help maintain public health and wellbeing. Drought option - supply side (HSE): Lower Itchen was assessed as having a moderate positive effect against this SEA objective through the resilience of the water supplies likely being improved by both options providing 38Ml/d of new water supply.

No further significant positive or moderate positive effects were identified. Some minor positive effects were across a wider range of the SEA objectives related to Biodiversity, Water - Quality and Water - Reliability,

Climatic Factors - Climate Change, Landscape, Historic Environment, Population & Human Health - Health & Wellbeing and Material Assets - Resource Use

Two drought options (Drought option - supply side (HSE): Candover (22Ml/d), and Drought option - supply side (HSE): Lower Itchen) were identified as having significant negative effects with uncertainty against the biodiversity SEA objective. This is in relation to the impacts on the River Itchen SAC. For Drought option - supply side (HSE): Candover (22Ml/d) a programme of mitigation and monitoring has been agreed which will likely address adverse effects. For Drought option - supply side (HSE): Lower Itchen Lower Itchen Drought Order Mitigation Package provide mitigation measures to increase resilience.

Drought option - demand side (HSE): NEUBs was assessed as having a significant negative effect against the health and wellbeing SEA objective through the non-essential use ban the option would create potentially economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban could therefore potentially result in the loss of businesses if the water-related operations must be suspended. Drought option - demand side (HSE): TUBs was identified as having a moderate negative effect against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

Moderate negative effects were also identified against the water quality SEA Objective (for Drought option - supply side (HSE): Candover (22Ml/d) and Drought option - supply side (HSE): Lower Itchen, reflecting the conclusions of the SEA and WFD assessments (2025) of the Drought Plan 2022), the carbon emissions SEA Objective (for Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d), due to estimated moderate levels of operational emissions) and tourism and recreation SEA Objective (for Drought option - demand side (HSE): NEUBs due to the potential for moderate impacts upon recreational activities due to restrictions on filling of swimming pools, watering of sports pitches, etc. and with the setting of tourist attractions, for example water features and parks/gardens).

No other significant negative or moderate negative effects were identified during the assessment of the operational phase of the options. However, a range of minor negative effects were identified against the biodiversity, soils, geodiversity, land use, water resilience, water quality, carbon emissions, climate change, landscape, historic environment, health and wellbeing, tourism and recreation and resource use SEA objectives.

Interzonal transfer options

There is one interzonal transfer options within the Hampshire Southampton East WRZ. This isInterzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d).

For Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) the Hampshire Southampton East WRZ would be the source zone, whilst the Hampshire Winchester WRZ would be the recipient zone. This option is described in Table 5-32 below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-33 below.

Table 5-32 Summary of interzonal options for HSE.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d)	62.2	Transfer from Otterbourne to Andover to Kingsclere WRZs. This scheme is designed to support network improvements needed for UTMRD transfer to Hampshire and/or the strategic scheme from IOW/South Hampshire.	2031

Table 5-33 Visual evaluation matrix summary (post mitigation) for HSE interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Southampton East (HSE)	Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	0	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+++	0	0	0	0	0	0	0	0	0
		Operation (negative)	-	0	0	0	0	0	-	0	0	0	0	0	0	0

Construction effects

For Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) no significant positive effects or significant negative effects were identified in the assessment of the construction phase. Minor negative effects were identified against the carbon emissions, landscape, health & wellbeing, resource use and built assets SEA objectives. Minor negative effects were also identified against the biodiversity, air, carbon emissions, landscape, historic environment, health and wellbeing, tourism & recreation, resource use and built assets SEA objectives during construction.

Operational effects

For Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d), a significant positive effect against the water reliability objective, as the option would increase transfers within the region, with of a yield of 62.2Ml/d, therefore increasing resilience. No other positive effects during operation were assessed for this option.

No likely significant negative effects were identified in the assessment of the operational phase. However, minor negative effects on the biodiversity and carbon emissions SEA objectives were assessed.

5.5.7 Hampshire Southampton West (HSW) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-34, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-35.

Table 5-34 Summary of options for HSW.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (HSW): NEUBs	1.93	Non-essential use ban - HSW WRZ.	2026
Drought option - demand side (HSW): Reduce transfer to other commercial customers	0.07	Drought option: In the event of a drought, the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027
Drought option - supply side (HSW): River Test (80Ml/d)	80	Test Surface Water Drought Order (from 2027 onwards).	2026
Drought option - demand side (HSW): TUBs	1.21	Temporary use bans - HSW WRZ.	2026
Groundwater (HSW): Test MAR (5.5Ml/d)	5.5	This option is a Managed Aquifer Recharge (MAR) scheme. It would provide recharge of the confined chalk aquifer from mains water in winter months, with subsequent onsite abstraction from the same aquifer in summer/autumn critical low flow periods. Treatment is available on site and it is assumed that there is sufficient treatment capacity for the abstracted water. The scheme assumes an extended pilot trial period to prove the viability of yield and water quality, with subsequent development of the MAR scheme. Expected DO from the developed scheme is ~5Ml/d. The pilot scheme assumes 1 No. abstraction/recharge borehole and 1 No. monitoring borehole, each 250m deep. For the duration of the trial, abstracted water will run to waste (River Test). The developed scheme will comprise a total of 5 No. boreholes at 250m depth; 3 No.	2036

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
		abstraction/recharge boreholes and 2 No. monitoring boreholes, inclusive of those used in the pilot scheme. Abstracted water from the developed scheme will be treated onsite as required, before entering supply. The suggested WTW site boundary may not support a DO of 5Ml/d. It is understood that Southern Water own adjacent land to the north of the River Test, and it is proposed that 1 No. abstraction/recharge borehole and 1 No. monitoring borehole be located on this land in order to achieve the desired scheme DO. Groundwater from the confined chalk aquifer is expected to be under artesian pressure and therefore gate valves would be required on all boreholes. Pumped recharge from mains water supply would also be required to overcome artesian pressure.	

Table 5-35 Visual evaluation matrix summary (post mitigation) for HSW.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Southampton West (HSW)	Drought option - demand side (HSW): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Hampshire Southampton West (HSW)	Drought option - demand side (HSW): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Hampshire Southampton West (HSW)	Drought option - supply side (HSW): River Test (80Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+++	0	0	0	0	0	+	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	--	0	0	--	0	0	-	-	0	0	0	0	0	0
Hampshire Southampton West (HSW)	Drought option - demand side (HSW): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Hampshire Southampton West (HSW)	Groundwater (HSW): Test MAR (5.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	-	0	0	-	-	-	-	-	-	-	-	-
		Operation (positive)	0	0	0	+	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	0	0	-	0	0	0	-	-	0	0	0	0	0	0

Construction effects

Four of thefive preferred options (Drought option - demand side (HSW): NEUBs, Drought option - demand side (HSW): Reduce transfer to other commercial customers, Drought option - supply side (HSW): River Test (80Ml/d) and Drought option - demand side (HSW): TUBs) were assessed as having neutral effects against all objectives for the construction phase as the nature of these options would involve operational changes only and no construction would be required for their implementation.

No positive effects or likely significant positive effects were identified from the construction works associated with Groundwater (HSW): Test MAR (5.5Ml/d).

No likely significant negative effects were identified from construction works expected for Groundwater (HSW): Test MAR (5.5Ml/d). The potential for minor negative effects from construction activities were identified for this option against the majority of SEA objectives, proportionate to the proximity of the option to various designated assets, the scale of construction works and expected use of resources.

Operational effects

A significant positive effect was identified for Drought option - supply side (HSW): River Test in terms of water reliability. The other four preferred options (Drought option - demand side (HSW): NEUBs, Drought option - demand side (HSW): Reduce transfer to other commercial customers, Drought option - demand side (HSW): TUBs, and Groundwater (HSW): Test MAR (5.5Ml/d)) were assessed as having a minor positive effect against the Water - Reliability SEA objective during the operation phase, attributed to the additional water yield or reduction in water demand that would help to deliver reliable and resilient water supplies.

Four of the preferred options were identified as having a positive effect on the Water - Quality SEA objective and the Climate Change SEA objective. Two drought options (Drought option - demand side (HSW): NEUBs and Drought option - demand side (HSW): TUBs) were identified as having minor positive effects across a wider range of the SEA objectives related to Biodiversity, Water - Quality and Reliability, Climatic Factors - Climate Change, Landscape, Historic Environment, Population & Human Health - Health & Wellbeing and Material Assets - Resource Use.

For Drought option - demand side (HSW): NEUBs significant negative effects were identified for the Health & Wellbeing SEA objective in the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. Drought option - demand side (HSW): TUBs was identified as having a moderate negative effect against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

No other significant negative effects were identified during the assessment of the operation phase for the preferred options; however, moderate negative effects were determined for individual options against two other SEA objectives. Drought option - supply side (HSW): River Test (80Ml/d) was assessed to have a moderate negative effect against the Biodiversity SEA objective during operation, based on uncertainties arising from a paucity of ecological evidence to determine potential impacts on designated sites (i.e. the River Test SSSI). Drought option - supply side (HSW): River Test (80Ml/d) was also assessed to have a moderate negative effect on the Water Quality SEA objective, reflecting the conclusions of the SEA and WFD assessments (2025) of the Drought Plan 2022), due to the potential for effects on the Test (Lower) waterbody and associated effects on the River Test SSSI (as noted above). Drought option - demand side (HSW): NEUBs was also identified as having a moderate negative effect against the Tourism & Recreation SEA objective through reducing the quantity of water made available for tourist attractions and water consuming recreational activities (swimming pools, watering sports pitches etc) during times of drought, which could dissuade tourists to the area for a brief period of time.

All other negative operation effects for the preferred options are identified as minor.

Interzonal transfer options

There are three interzonal transfer options within the Hampshire Southampton West Zone; these areInterzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d), Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d), and Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d).

Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) and Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) would enable bi-directional transfers between the Hampshire Southampton West WRZ and the Hampshire Rural WRZ. A summary of Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) is presented in Table 5-36 below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-37 below. A summary of Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) is presented in in Table 5-(Section 5.5.4), whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-25Table 5-25 Visual evaluation matrix summary (post mitigation) for HRZ interzonal transfers. (Section 5.5.4); in order to avoid undue duplication, these tables are not repeated here.

Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) has been redesigned such that the link is now between HSW and HWZ and connects to the Andover Link Main. A summary of this option is presented in Table 5-36 below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-37 below.

Table 5-36 Summary of interzonal options for HSW.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d)	3.1	Development and upgrade of existing transfer between Romsey Town & Broadlands valve (HSW-HRZ). This option involves installing a new booster station with 5Ml/d flow capacity to an existing transfer to allow bi-directional flow.	2026
Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d)	60	Yew Hill to Rownans Southampton Link Main	2031

Table 5-37 Visual evaluation matrix summary (post mitigation) for HSW interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Hampshire Southampton West (HSW)	Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	-	0	0	0	-	0	-	0	0	0	-	0
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	-	0	0	0	-	0	0	0	0	0	0	0
Hampshire Southampton West (HSW)	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	--	--	-	0	-	--	0	-	-	-	-	--	-
		Operation (positive)	0	0	0	0	+++	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	-	0	0	-	0	-	0	0	0	0	0

Construction effects

ForInterzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d), and Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) no significant, moderate or minor positive effects were identified in the assessment of the construction phase.

No likely significant negative effects were identified in the assessment of the construction phase.

Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) was assessed as having minor negative effects against the biodiversity, water resilience, carbon emissions, landscape, and resource use SEA objectives.

Moderate negative effects were identified for Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) against the soils, geodiversity and land use, water resilience, carbon emissions and resource use SEA objectives. Minor negative effects were also identified against the biodiversity, water quality, air, landscape, historic environment, health and wellbeing, tourism and recreation and built assets SEA objectives for the construction phase.

As described in Section 5.5.4, for Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d), no likely significant positive effects or likely significant negative effects were identified during the assessment of the construction phase, with only minor negative effects identified.

Operational effects

Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) was assessed as having a significant positive effect against the water reliability SEA objective, reflecting the significant transfer capacity that it would provide, thereby increasing the resilience of supply. No other significant positive or significant negative effects were identified in the assessment of the three options.

For Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d), a minor positive effect was identified against the water reliability SEA objective, whilst minor negative effects were identified against the water resilience and carbon emissions SEA objectives.

For Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) minor positive effects were identified against the climate change resilience and health and wellbeing SEA objectives, whilst minor negative effects were identified against the water quality carbon emissions, and landscape SEA objectives.

As described in Section 5.5.4 for Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d), no likely significant positive effects or likely significant negative effects were identified in the assessment of the operational phase, with only minor effects identified.

5.6 Eastern area

5.6.1 Kent Medway East (KME) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-38, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-39.

Table 5-38 Summary of options for KME.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (KME): NEUBs	2.11	Non-essential use ban - KMW WRZ	2026
Drought option - demand side (KME): TUBs	1.59	Temporary use bans - KMW WRZ	2026
Desalination (KME): Isle of Sheppey (10Ml/d) phase 2	10	The Isle of Sheppey Desalination options comprise a suite of modular options that represent different sizes of desalination plant that could be developed in one or more phases. This particular option proposes a second phase developing an additional 10Ml/d desalination capacity and is contingent on the 10Ml/d or 20Ml/d first phase options i.e. IoS10 or IoS20.	2063
Desalination (KME): Isle of Sheppey 20Ml/d	20	The Isle of Sheppey Desalination options comprise a suite of modular options that represent different sizes of desalination plant that could be developed in one or more phases. This particular option proposes a first phase, developing a 20Ml/d desalination capacity.	2041
Groundwater (KME): Recommission Gravesend (2.7Ml/d)	2.65	Windmill Hill source is a well and adit system that was decommissioned in 2007 due to high nitrate levels. A new nitrate treatment plant was constructed on site in 2006. A Source Investigation & Optimisation Study (SIOS) suggested that the nitrate problem was likely to be a faulty nitrate monitor. The report recommended the source could be recommissioned through a) Undertaking a long-term step test with steps of seven days duration at rates of 3.0Ml/d, 3.3Ml/d and maximum pump capacity (approximately 3.66Ml/d) subject to stabilisation of pumping water levels during each step b) Recalibration	2031

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Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
		or repair of the online raw water nitrate monitor, c) Modify the headworks to the satellite well chamber to facilitate improved access. Refurbishment of the existing nitrate plant will also be required. Scheme Output: 5Ml/d	
Recycling (KME): Sittingbourne Industrial Water Reuse (7.5Mld)	7.5	This option is to use a water recycling scheme to unlock additional volume in an existing industrial borehole licence to increase the scope of the licence trading. The existing industrial user currently utilises the groundwater in its paper/board making processes. It has been assumed at this stage that the reverse osmosis wastewater can be discharged through Sittingbourne WwTW existing outfall.	2031
Drought option - demand side (KME): Reduce transfer to other commercial customers	0.1	Drought Option: In the event of a drought, the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027

Table 5-39 Visual evaluation matrix summary (post mitigation) for KME.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Kent Medway East	Drought option - demand side (KME): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Kent Medway East	Drought option - demand side (KME): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Kent Medway East	Desalination (KME): Isle of Sheppey (10Ml/d) phase 2	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	0	-	-	0	-	--	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	---/?	0	0	--	0	-	--	0	-	0	0	0	-	0
Kent Medway East	Desalination (KME): Isle of Sheppey 20Ml/d	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	0	-	-	0	-	--	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	+	0	0	0	0	0	0
		Operation (negative)	---/?	0	0	--	0	-	--	0	-	0	0	0	-	0
Kent Medway East	Groundwater (KME): Recommission Gravesend (2.7Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	-	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	0	0	0	---	0	0	-	-	0	0	0	0	0	0
Kent Medway East	Recycling (KME): Sittingbourne Industrial Water Reuse (7.5Mld)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	-	-	0	-	-	0	-	-	-	-	-	-

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WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	--/?	0	0	--	0	0	-	0	0	0	0	0	0	0
Kent Medway East	Drought option - demand side (KME): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0

Construction effects

All four of the preferred supply options requiring construction were assessed as having a negative or potentially negative effect on the biodiversity SEA objective, associated with the potential for construction works to affect designated and/or non-designated habitats, species and features through either direct land take, noise and/or disturbance (e.g. vibration, dust). Two options related to the Isle of Sheppey desalination scheme (Desalination (KME): Isle of Sheppey (10Ml/d) phase 2 and Desalination (KME): Isle of Sheppey 20Ml/d) were assessed as having a moderate negative effect on the biodiversity SEA objective. This effect was assessed because the option pipeline passes through Medway and Estuary Marshes SSSI, is adjacent to The Swale SSSI and includes ancient woodland. There is also the potential for effects on the protected features of the Medway Estuary MCZ as the construction of the intake/outfall could directly affect the MCZ. However, measures to minimise impacts and reinstatement/compensation, and careful routing, is likely to reduce or avoid the potential impacts on these features. The HRA appropriate assessment found that construction effects on the integrity of The Swale SPA/Ramsar, Medway Estuary and Marshes SPA/Ramsar, Thames Estuary and Marshes SPA/Ramsar, and Outer Thames Estuary SPA are avoidable with established measures. As such construction is likely to have a moderate negative effect. All other negative construction effects for these options were identified as minor with the application of mitigation measures.

Three options (Drought option - demand side (KME): NEUBs; Drought option - demand side (KME): TUBs; Drought option - demand side (KMW): Reduce transfer to other commercial customers) were assessed as having neutral effects as they would involve no construction and would involve operational changes only.

Operational effects

No significant positive effects were identified for these options.

Positive effects were assessed for all options for the Water - reliability SEA objective, reflecting the positive impact on water resilience. For the option Desalination (KME): Isle of Sheppey 20Ml/d, a moderate positive effect was assessed against this objective, and the remaining options in this zone were assessed as having a minor positive effect against this objective.

Six options were identified as having positive effects on climate change SEA objective. Two drought options (Drought option - demand side (KME): NEUBs; Drought option - demand side (KME): TUBs) were identified as having minor positive effects across a wider range of SEA objectives related to biodiversity, water quality and reliability, climatic factors - climate change, landscape, historic environment, population & human health - health & well-being and material assets - resource use.

Significant negative effects with some uncertainty were assessed for the biodiversity objective for the Isle of Sheppey desalination plant options (Desalination (KME): Isle of Sheppey (10Ml/d) phase 2 and Desalination (KME): Isle of Sheppey 20Ml/d) in relation to the hypersaline discharge from the outfall and potential for effects on the Medway Estuary and Marshes SPA and Ramsar and Thames Estuary and Marshes SPA and Ramsar and the Medway Estuary MCZ. Whilst the HRA appropriate assessment notes that adverse effects are likely avoidable based on proxy data and evidence from similar sites / schemes, the operation of the scheme may affect the supporting habitats of the qualifying features, although evidence from elsewhere indicates that the zone of environmental change will be small and could be minimised further by appropriate location of the outfall (taking account of local hydrodynamics) and operational practice. However, there are residual uncertainties that cannot be resolved at the plan level. For The Swale SPA and Ramsar, the appropriate assessment notes that the designated site will have a low exposure to operational effects due to its location relative to the outfall. For the Outer Thames Estuary SPA the appropriate assessment notes that adverse effects are almost certainly avoidable based on proxy data and evidence from similar sites / schemes. Given the residual uncertainty in relation to Medway Estuary and Marshes SPA and Ramsar and Thames Estuary and Marshes SPA and Ramsar significant effects with uncertainty are identified for the operation phase.

Recycling (KME): Sittingbourne Industrial Water Reuse (7.5Mld) was assessed as having moderate negative effects with uncertainty against the biodiversity objective. This relates to the location of the outfall. The HRA notes that the principal issue for the Swale SPA and Ramsar relate the potential effects on Milton Creek as 'functional habitat' and small reductions in non-saline inputs into the Swale via Milton Creek. The HRA notes this is likely to be inconsequential but aspects of this can only be confirmed with the benefit of project-level survey and modelling, hence residual uncertainties remain for these sites.

Significant negative effects were assessed for Groundwater (KME): Recommission Gravesend (2.7Ml/d) in respect of the Water Quality SEA objective. This reflects the findings of the WFD assessment which confirms potential WFD non-compliance (with medium confidence) for the North Kent Medway Chalk groundwater body and potential WFD non-compliance (with low confidence) for the Ebbsfleet waterbody. The WFDhighlights that an increase in abstraction, even within licence, would be considered to fail the water balance test and potentially dependent surface water body status. Significant negative effects are therefore assessed.

Moderate negative effects were assessed for the Isle of Sheppey desalination options (Desalination (KME): Isle of Sheppey (10Ml/d) phase 2 and Desalination (KME): Isle of Sheppey 20Ml/d;) for the SEA objective related to water quality. The assessment reflects the findings of WFD assessment of potential non-compliance (with low confidence) for the Medway and Swale waterbodies regarding hypersaline discharge. Moderate negative effects were also identified for the Carbon emissions SEA objective. For Recycling (KME): Sittingbourne Industrial Water Reuse (7.5Mld) moderate negative effects were also identified against the water quality objective, reflecting that the WFD Stage 2 assessment concludes potential WFD non-compliance (with low confidence) for the Swale transitional waterbody, as the option will result in reduced discharge from Sittingbourne WwTW to the Swale, with the ALS showing restricted water available for the lower Swale catchment. Considering the perceived sensitivity of freshwater flows to estuaries, potential non-compliance has been concluded on a precautionary basis. However, this requires further assessment.

For Drought option - demand side (KME): NEUBs significant negative effects were identified for the Health and wellbeing SEA objective in the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. Drought option - demand side (KME): TUBs was identified as having moderate negative effects against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

Drought option - demand side (KME): NEUBs was identified as having a moderate negative effect against the population & human health - tourism & recreation SEA objective through reducing the quantity of water made available for tourist attractions and water consuming recreational activities (swimming pools, watering sports pitches etc) during times of drought, which could dissuade tourists to the area for a brief period of time.

All other residual negative effects were identified as minor.

Interzonal transfer options

There are two interzonal transfer options within the Kent Medway East WRZ. Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d) would involve conditioning of an existing main to enable bi-directional transfers (and specifically from Kent Thanet WRZ to Kent Medway East WRZ). A summary of this option is presented in Table 5-46 (Section 5.6.3), whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-47 (Section 5.6.3); in order to avoid undue duplication, these tables are not repeated here.

Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d) would support transfer from Kent Medway East WRZ to Kent Thanet WRZ and is described in Table 5-40 below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-41 below.

Table 5-40 Summary of interzonal options for KME.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d)	3.27	The current operational transfer from Kent Medway East to Kent Thanet is limited to the output from Faversham4 WSW. This option enables flows from the Faversham3 groundwater source to be directed, via an existing main, towards Selling WSW. A soakaway is installed at Selling to allow for reconditioning of the existing main and the addition of UV treatment at Selling permits disinfection of the Throwley flows.	2040

Table 5-41 Visual evaluation matrix summary (post mitigation) for KME interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Kent Medway East (KME)	Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	0	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	0	0	0	0
		Operation (negative)	-	-	0	0	0	0	-	0	-	0	0	0	0	0

Construction effects

As described in Section 5.6.3, no significant positive effects or significant negative effects were identified during the assessment of the construction phase of Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d). However, it is noted that a moderate negative effect was assessed against the water quality SEA objective due to the potential for contamination to water bodies, including main rivers, which the pipeline crosses, including within the Kent Medway East WRZ.

Similarly, no significant positive effects and no significant negative effects were identified in the assessment of the construction phase of Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d). However, the option was assessed as having minor negative effects on the biodiversity, soils, geodiversity and land use, air, carbon emissions, landscape, historic environment, health & wellbeing, tourism & recreation, resource use and built assets SEA objectives during the construction phase.

Operational effects

As described in Section 5.6.3, for Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d) no significant positive effects or significant negative effects were identified during the assessment of the operational phase, with only minor effects being identified in the assessment.

Similarly, for Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d) no significant positive effects or significant negative effects were identified in the assessment of the operational phase. However, a moderate positive effect was identified against the water reliability SEA objective, as the option would transfer of water to areas of deficit (bi-directional) without requiring abstraction. Additionally, minor negative effects were identified against the biodiversity, soils, geodiversity and land use, carbon emissions and landscape objectives.

5.6.2 Kent Medway West (KMW) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-42, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-43.

Table 5-42 Summary of options for KMW.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (KMW): NEUBs	1.33	Non-essential use ban - KMW WRZ	2026
Drought option - demand side (KMW): TUBs	1	Temporary use bans - KMW WRZ	2026
Desalination (KMW): Thames Estuary (10Ml/d)	10	The Thames Estuary Desalination Options are a modular suite of options to develop a desalination plant of differing capacities that could be developed in one or more phases. The plant would be developed adjacent to Britannia Refined Metal on the Swanscombe Peninsula. Treated water would be transferred to Singlewell WSR for distribution to the Kent Medway WRZ and the plant would combine discharge with Swanscombe WwTW's existing outfall. This option represents a potential first phase development of a 10Ml/d capacity desalination plant.	2041
Desalination (KMW): Thames Estuary (10Ml/d) Phase 2	10	The Thames Estuary Desalination Options are a modular suite of options to develop a desalination plant of differing capacities that could be developed in one or more phases. This option represents a potential second phase development of a 10Ml/d capacity desalination plant contingent on one of the first phase 10Ml/d or 20Ml/d capacity options (Swa10 or Swa20).	2041
Desalination (KMW): Thames Estuary (20Ml/d)	20	The Thames Estuary Desalination Options are a modular suite of options to develop a desalination plant of differing capacities that could be developed in one or more phases. This option represents a potential first phase development of a 20Ml/d capacity desalination plant.	2040
Desalination (KMW): Thames Estuary (20Ml/d) Phase 2	20	The Thames Estuary Desalination Options are a modular suite of options to develop a desalination plant of differing capacities that could be developed in one or more phases.	2040

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
		This option represents a potential second phase development of a 20Ml/d capacity desalination plant contingent on one of the first phase 10Ml/d or 20Ml/d capacity options (Swa10 or Swa20).	
Recycling (KMW): Medway WTW to lake (14Ml/d)	14	This option involves the transfer of 18Ml/d of treated effluent from Aylesford WWTW to near Rochester WSW's raw water storage reservoir Eccles Lake.	2031
Drought option - supply side (KMW): River Medway Scheme 1-4 (17Ml/d)	17	Bewl Water increased filling. Drought option: There are four sub-options involving a change in MRF and the release factor from the reservoir: (1) 2nd Dry Winter, MRF 150Ml/d, RF 1:1 (2) 3rd Dry Winter, MRF 150Ml/d RF, 1:0 (3) The following Summer, MRF 275Ml/d RF, 1:0 (4) The following Autumn MRF None, RF 0:0, Springfield abstracts without releases from Bewl Water. Normal compensation releases continue. Bewl Water is a pumped storage reservoir with abstractions from the River Teise at Smallbridge and the River Medway near Maidstone. The Permit may take the form of authorisations to allow increased re-filling and conservation of existing storage of Bewl. The precise conditions applied for will depend upon the severity and timing of each drought.	2026
Asset enhancement (KMW): Remove network constraint at Longfield (13Ml/d)	13.3	System simulation modelling has identified that the KMW Water Resource Zone Deployable Output appears to constrained due to a network capacity issue between Nursted and Pitfield Service Reservoirs. There is also a flow limitation between Cobham and Singlewell Service Reservoirs which restricts the movement of water from the River Medway Scheme. This scheme would undertake further network modelling to remove these network constraints to allow currently locked-in deployable output to be used to support the restricted parts of the network. The potential solutions would be to:•	2026

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
		Validate the network constraint through updated and further exploration and validation of the Pywr System model to determine the optimal solution• If required, upgrade new transfer valve and/or booster (Northfleet Nurstead WBS) station Between Northfleet WSW and Nurstead Meopham WSR.• If required, upgrade water treatment process at Longfield WSW (upgrade to Amazon Filtration) to allow source to produce higher output up to licence and historical limit (~7Ml/d) • Increase capacity water main and, if required, an upgraded Booster station at Singlewell or Cobham WSRs	
Drought option - demand side (KMW): Reduce transfer to other commercial customers	0.09	Drought Option: In the event of a drought the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027

Table 5-43 Visual evaluation matrix summary (post mitigation) for KMW.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Kent Medway West	Drought option - demand side (KMW): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Kent Medway West	Drought option - demand side (KMW): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Kent Medway West	Desalination (KMW): Thames Estuary (10Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0

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WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	---/?	0	-	--	0	-	-	0	-	0	0	0	-	0
Kent Medway West	Desalination (KMW): Thames Estuary (10Ml/d) Phase 2	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	---/?	0	-	--	0	-	-	0	-	0	0	0	-	0
Kent Medway West	Desalination (KMW): Thames Estuary (20Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	-	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	++	0	0	+	0	0	0	0	0	0
		Operation (negative)	---/?	0	-	--	0	-	-	0	-	0	0	0	-	0
Kent Medway West	Desalination (KMW): Thames Estuary (20Ml/d) Phase 2	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	-	0	-	-	0	-	-	-	-	-	-

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WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (positive)	0	0	0	0	++	0	0	+	0	0	0	0	0	0
		Operation (negative)	---/?	0	-	--	0	-	-	0	-	0	0	0	-	0
Kent Medway West	Recycling (KMW): Medway WTW to lake (14Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	-	--	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	-	0	0	---	0	0	-	0	0	0	0	0	0	0
Kent Medway West	Drought option - supply side (KMW): River Medway Scheme 1-4 (17Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	-	0	0	---	0	0	0	-	0	0	0	0	0	0
		Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Kent Medway West	Asset enhancement (KMW): Remove network constraint at Longfield (13Ml/d)	Construction (negative)	-	-	-	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Kent Medway West	Drought option - demand side (KMW): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0

Construction effects

No positive or likely significant positive effects were identified for construction.

No likely significant negative effects have been identified for construction.

All six of the preferred supply options requiring construction were assessed as having a negative or potentially negative effect on the biodiversity SEA objective, associated with the potential for construction works to affect designated and/or non-designated habitats, species and features through either direct land take, noise and/or disturbance (e.g. vibration, dust). Four options related to the River Thames desalination scheme (Desalination (KMW): Thames Estuary (10Ml/d); Desalination (KMW): Thames Estuary (10Ml/d) Phase 2; Desalination (KMW): Thames Estuary (20Ml/d); and Desalination (KMW): Thames Estuary (20Ml/d) Phase 2) were assessed as having a moderate negative effect on the biodiversity SEA objective. This effect was assessed because the option would involve works within the Swanscombe Peninsula SSSI. As such construction of the option is likely to have a moderate negative effect on these areas following application of mitigation measures to minimise loss and reinstatement/compensation of any habitats lost.

For Recycling (KMW): Medway WTW to lake (14Ml/d) moderate effects in the construction phase were identified for the Water Quality SEA objective linked to the findings of the WFD assessment which identified WFD non-compliance (with low confidence) for Eccles Lake. All other negative construction effects for these options were identified as minor.

Four options (Drought option - demand side (KMW): NEUBs; Drought option - demand side (KMW): TUBs; Drought option - supply side (KMW): River Medway Scheme 1-4 (17Ml/d); and Drought option - demand side (KMW): Reduce transfer to other commercial customers) were assessed as having neutral effects as they would involve no construction and would involve operational changes only.

Operational effects

Positive effects were assessed for all options for the Water - reliability SEA objective, reflecting the positive impact on water resilience, for two options (Desalination (KMW): Thames Estuary (20Ml/d) and Desalination (KMW): Thames Estuary (20Ml/d) Phase 2) due to their provision of desalinated and treated water to the KMW WRZ.

Seven options were identified as having positive effects on climate change SEA objective. Two drought options (Drought option - demand side (KMW): NEUBs; Drought option - demand side (KMW): TUBs) were identified as having minor positive effects across a wider range of SEA objectives related to biodiversity, water quality and reliability, climatic factors - climate change, landscape, historic environment, population & human health - health & well-being and material assets - resource use.

Significant negative effects with some uncertainty were assessed for the biodiversity objective for the River Thames desalination options (Desalination (KMW): Thames Estuary (10Ml/d); Desalination (KMW): Thames Estuary (10Ml/d) Phase 2; Desalination (KMW): Thames Estuary (20Ml/d); and Desalination (KMW): Thames Estuary (20Ml/d) Phase 2) in relation to the hypersaline discharge from the outfall into the River Thames and potential for effects on the Thames Estuary and Marshes SPA and Ramsar. The HRA Appropriate Assessment notes that based on the predicted effect of this option both alone and in-combination with other plans and projects, there is sufficient confidence that appropriate mitigation measures are available at the project level and can be implemented to enable a conclusion of no adverse effect on the integrity of the Thames Estuary and Marshes SPA/Ramsar to be drawn for the WRMP HRA. However, the option crosses the Swanscombe Peninsula SSSI, therefore significant negative effects with uncertainty are identified for these options.

Significant negative effects were identified against the water quality SEA objective for Drought option - supply side (KMW): River Medway Scheme 1-4 (17Ml/d) and Recycling (KMW): Medway WTW to lake (14Ml/d).

For Drought option - supply side (KMW): River Medway Scheme 1-4 (17Ml/d), this reflects that the WFD assessment (2025) of the Southern Water Drought Plan 2022, highlights that with regard to the Bewl, Teise

at Lamberhurst, Teise and Lesser Teise, Beult at Yalding, Lower Teise, and Medway at Maidstone waterbodies, there is a low to medium risk of temporary deterioration in status, whilst for the Medway transitional waterbody, there is a low risk of temporary deterioration in status. The SEA assessment (2025) of the Southern Water Drought Plan 2022 highlights that the implementation of Stage 4 of the Drought Order in winter would result in major adverse effects on river flows downstream of Bewl Water Reservoir and through all downstream river reaches to the tidal limit of the river, with moderate adverse effects on freshwater flow to the Medway Estuary. There would be a moderate adverse effect on water quality and major adverse effects on aquatic ecology in the freshwater reaches of the river. Minor adverse effects on aquatic ecology in the Medway Estuary Marine Conservation Zone are anticipated, with no likely significant effects anticipated on the Medway Estuary and Marshes SPA, SSSI and Ramsar sites. For Recycling (KMW): Medway WTW to lake (14Ml/d), the significant negative reflects that the WFD (2025) Stage 2 assessment concludes potential WFD non-compliance (with medium confidence) for the Eccles Lake waterbody, due to the potential for a new discharge into the reservoir to change the physico-chemistry of the water body, which could impact on biological status elements, including phytoplankton communities, particularly if the option was used during drought periods, i.e. with low water levels and high temperatures. Further assessment is therefore required to consider the final characteristics of the new discharge and ensure that water quality is not compromised. Moderate effects were assessed for the River Thames desalination options (Desalination (KMW): Thames Estuary (10Ml/d); Desalination (KMW): Thames Estuary (10Ml/d) Phase 2; Desalination (KMW): Thames Estuary (20Ml/d); and Desalination (KMW): Thames Estuary (20Ml/d) Phase 2) for the SEA objective related to water quality. The assessment reflects the findings of WFD assessment of potential non-compliance (with low confidence) for the Thames Middle waterbody related to the hypersaline discharge.

For Drought option - demand side (KMW): NEUBs significant negative effects were identified for the Health and wellbeing SEA objective in the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. This is the only significant negative effect associated with any of the options. Drought option - demand side (KMW): TUBs was identified as having moderate negative effects against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

Drought option - demand side (KMW): NEUBs was identified as having a moderate negative effect against the population and human health - tourism & recreation SEA objective through reducing the quantity of water made available for tourist attractions and water consuming recreational activities (swimming pools, watering sports pitches etc) during times of drought, which could dissuade tourists to the area for a brief period of time.

All other residual negative effects were identified as minor.

5.6.3 Kent Thanet (KTZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-44, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-45.

Table 5-44 Summary of options for KTZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (KTZ): NEUBs	1.54	Non-essential use ban - KTZ WRZ.	2026
Drought option - demand side (KTZ): TUBs	1.16	Temporary use bans - KTZ WRZ.	2026
Bulk import (KTZ): SEW Kingston to Near Canterbury (2Ml/d)	2	A 2Ml/d import from SEW Kingston Southern Water to Southern Water Canterbury WSW.	2026
Desalination (KTZ): East Thanet (20Ml/d)	20	The East Thanet Desalination Options are a modular suite of options to develop a desalination plant of differing capacities near to the North Thanet Coast and could be developed in one or more phases. The plant would supply potable desalinated water to the Kent Thanet WRZ. This option represents a potential first phase development of a 20Ml/d capacity desalination plant.	2041
Desalination (KTZ): East Thanet (20Ml/d) Phase 2	20	The East Thanet Desalination Options are a modular suite of options to develop a desalination plant of differing capacities near to the North Thanet Coast and could be developed in one or more phases. The plant would supply potable desalinated water to the Kent Thanet WRZ. This option represents a potential second phase development of a 20Ml/d capacity desalination plant contingent on one of the first phase 20Ml/d option.	2051
Bulk import (KTZ): SEW Canterbury to Near	20	Bi-directional transfer between South East Water RZ8 and Kent Thanet WRZ in the vicinity of Southern Water's Canterbury WS. Indirectly supplied from Broad Oak Reservoir. Maximum capacity of 20Ml/d.	2050

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Canterbury (20Ml/d)			
Drought option - demand side (KTZ): Reduce transfer to other commercial customers	0.1	Drought Option: In the event of a drought, the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027

Table 5-45 Visual evaluation matrix summary (post mitigation) for KTZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Kent Thanet (KTZ)	Drought option - demand side (KTZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Kent Thanet (KTZ)	Drought option - demand side (KTZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Kent Thanet (KTZ)	Bulk import (KTZ): SEW Kingston to Near Canterbury (2Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	0	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Kent Thanet (KTZ)	Desalination (KTZ): East Thanet (20Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	---/?	-	-	-	0	-	--	0	-	-	-	0	-	-
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	0	0	0	0
		Operation (negative)	---/?	0	0	--	0	0	--	0	0	0	0	0	-	0
Kent Thanet (KTZ)	Desalination (KTZ): East Thanet (20Ml/d) Phase 2	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	-	-	-	0	-	--	0	-	-	-	0	-	-
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	0	0	0	0
		Operation (negative)	---/?	0	0	--	0	0	--	0	0	0	0	0	-	0
Kent Thanet (KTZ)	Bulk import (KTZ): SEW Canterbury to Near Canterbury (20Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	-	-	0	-	-	0	-	-	-	-	-	-

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (positive)	0	0	0	0	++	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Kent Thanet (KTZ)	Drought option - demand side (KTZ): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0

Construction effects

No significant positive effects or positive effects are identified for the options during the construction phase.

Desalination (KTZ): East Thanet (20Ml/d) was assessed as having a significant negative effect with uncertainties during the construction phase. This is due to the option constructing a new desalination plant and associated pipeline that would be located within the Thanet Coast SSSI, run through the SSSI impact zones associated with the Sandwich Bay to Hacklinge Marshes SSSI, and has the potential to impact upon the Thanet Coast MCZ, which could also affect the Thanet Coast SAC. The HRA Appropriate Assessment ruled out adverse effects on the Thanet Coast SAC, Stodmarsh SPA, and Thanet Coast and Sandwich Bay SPA and Ramsar. However, the Appropriate Assessment notes that with regards to the Outer Thames Estuary SPA, the outfall will be located within the site, and for Margate and Long Sands SAC, the outfall for the plant is likely to be located in or close to this site (although location outside the site will be possible). There are some uncertainties that can only be resolved with detailed design (e.g. sediment deposition and hydrodynamics may be affected if the pipeline is not buried), but these appear avoidable or mitigatable, such that adverse effects on integrity do not appear to be an unavoidable outcome of the option. Some uncertainty remains. eNo other significant effects were identified during the assessment of the construction phase of the options. The East Thanet desalination options (Desalination (KTZ): East Thanet (20Ml/d) and Desalination (KTZ): East Thanet (20Ml/d) Phase 2) were identified as having moderate effects on carbon emissions reflecting the carbon generated from materials used to construct the new infrastructure (embodied carbon) and construction activities. The relative carbon scale identified that the option has moderate construction carbon emissions (relative to other WRSE Regional Plan options).eMinor negative effects were identified against the biodiversity, soils, geodiversity, land use, water resilience, water quality, air, carbon emissions, landscape, historic environment, health and wellbeing, tourism and recreation and resource use SEA objectives. eOperational effects

No significant positive effects were identified in the operation stage.

Four options were identified as providing a minor positive effect against the water reliability SEA objective through improving consumers ability to access water resources. Three options (Desalination (KTZ): East Thanet (20Ml/d), Desalination (KTZ): East Thanet (20Ml/d) Phase 2 and Bulk import (KTZ): SEW Canterbury to Near Canterbury (20Ml/d)) have been assessed as having a moderate positive effect against this objective. The East Thanet options will facilitate water supply once operational, by supplying potable desalinated water to the Kent Thanet WRZ, and the latter option will improve water resources transfer, improving resilience by transferring water from an area of surplus to one of deficit.

Three options (Drought option - demand side (KTZ): NEUBs, Drought option - demand side (KTZ): TUBs and Drought option - demand side (KTZ): Reduce transfer to other commercial customers) scored as having a minor positive effect against the climate change SEA objective, with the rest of the options scoring neutral.

Further minor positive effects were identified for the drought options against the biodiversity, water quality, carbon emissions, landscape, historic environment and resource use SEA objective.

The East Thanet desalination options (Desalination (KTZ): East Thanet (20Ml/d) and Desalination (KTZ): East Thanet (20Ml/d) Phase 2) were assessed as resulting in significant negative effects with uncertainties against the biodiversity SEA objective in relation to the location of the outfall within the Thanet Coast SSSI and Thanet Coast MCZ, and potential for effects on the Outer Thames Estuary SPA and Margate and Long Sands SAC. The HRA notes that adverse effects are likely avoidable based on proxy data and evidence from similar sites / schemes. However, there are inevitably some uncertainties due that can only be resolved with detailed design (e.g. sediment deposition and hydrodynamics may be affected if the pipeline is not buried), but these appear avoidable or mitigatable, such that adverse effects on integrity do not appear to be an unavoidable outcome of the option. Given the residual uncertainty, significant effects with uncertainty are identified for the operation phase.

For Drought option - demand side (KTZ): NEUBs significant negative effects were identified for the health and well-being SEA objective in the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. Drought option - demand side (KTZ): TUBs was identified as having moderate negative effects against this SEA objective through potentially limiting water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

No other significant negative effects were identified. Moderate effects were assessed for the East Thanet desalination options (Desalination (KTZ): East Thanet (20Ml/d)and Desalination (KTZ): East Thanet (20Ml/d) Phase 2) for the SEA objective related to water quality. The assessment reflects the findings of WFD assessment of potential non-compliance (with low confidence) for the Kent North waterbodies regarding hypersaline discharge. These options were also identified as having moderate effects on carbon emissions reflecting the carbon generated from operation of the desalination plane. The relative carbon scale identified that the option has moderate operational carbon emissions (relative to other WRSE Regional Plan options).

All other residual effects were identified as minor.

Interzonal transfer options

There are two interzonal transfer options within the Kent Thanet WRZ. Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d) would support transfer from Kent Medway East WRZ to Kent Thanet WRZ and summary of this option is presented in Table 5-40 (Section 5.6.1), whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-41 (Section 5.6.1); in order to avoid undue duplication, these tables are not repeated here.

Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d) would involve conditioning of an existing main to enable bi-directional transfers (and specifically from Kent Thanet WRZ to Kent Medway WRZ) and is described in Table 5-46 below, whilst a summary of the assessment of its effects (post mitigation) is set out in Table 5-47 below.

Table 5-46 Summary of interzonal options for KTZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d)	15.75	Conditioning of existing Selling-Fleete main to enable bi-directional transfers (and specifically from Kent Thanet to Kent Medway). It is not thought that any additional pipeline would be required, although this is dependent on the existing main being structurally sound.	2026

Table 5-47 Visual evaluation matrix summary (post mitigation) for KTZ interzonal transfers.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Kent Thanet (KTZ)	Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	-	--	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	-	0	0	0	0	0

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Construction effects

As described in Section 5.6.1 for Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d) no significant positive effects or significant negative effects were identified during the assessment of the construction phase.

Similarly, no significant positive effects or significant negative effects were identified during the assessment of the construction phase of Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d). However, a moderate negative effect was identified against the water quality SEA objective, due to the potential for contamination to water bodies, including main rivers, which the pipeline crosses, including within the Kent Thanet WRZ. Additionally, the option was assessed as having minor negative effects on the biodiversity, soils, geodiversity and land use, water resilience, air, carbon emissions, landscape, historic environment, health & wellbeing, tourism & recreation, resource use and built assets SEA objectives during the construction phase.

Operational effects

As described in Section 5.6.1 for Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d) no significant positive effects or significant negative effects were identified in the assessment of the operational phase. However, a moderate positive effect was identified against the water reliability SEA objective, as the option would transfer of water to areas of deficit (bi-directional) without requiring abstraction.

For Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d), no significant positive or significant negative were in the assessment of the operational phase. However, a minor positive effect was identified against the water reliability SEA objective, whilst minor negative effects were identified against the carbon emissions and landscape SEA objectives.

5.6.4 Sussex Hastings (SHZ) WRZ

Options wholly within the WRZ

The options within the WRZ are described in Table 5-48, whilst a summary of the assessment of effects (post mitigation) is set out in Table 5-49.

Table 5-48 Summary of options for SHZ.

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
Drought option - demand side (SHZ): NEUBs	0.66	Non-essential use ban - SHZ WRZ	2026
Drought option - demand side (SHZ): TUBs	0.49	Temporary use bans - SHZ WRZ	2026
Groundwater (SHZ): Reconfigure Rye Wells (1.5Ml/d)	1.5	Brede groundwater source is a well & audit system that is over 100 years old, and has reached the end of its asset life. It abstracts from the Ashdown Beds. Operational wells 1 and 3 are to be replaced by boreholes. Additional land may be required for at least one of the boreholes due to space constraints on site. Wells 2 and 4 are out of service and do not require replacement. Scheme output is 1.5Ml/d. There is an existing surface water WSW on site and no further treatment is required.	2036
Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d)	5.7	New resource. This option is a new 8Ml/d water recycling plant producing a DO of 5.7Ml/d near Tunbridge WwTW and a transfer of the treated water to Bewl reservoir, which feeds into Darwell reservoir. Process losses have been included.	2036
Recycling (SHZ): Hastings to Darwell (15.3Ml/d)	15.3	This option is a new 21.5Ml/d water recycling plant producing a DO of 15.3Ml/d near Bexhill and Hastings WwTW and a transfer of the treated effluent to Darwell reservoir, which feeds into the Hastings Area. Process losses have been included.	2051
Bulk import (SHZ): SEW RZ8 to Rye	7.05	A new bi-directional Transfer between SEW Kingsnorth and Southern Water Brede WSW with a capacity of 10Ml/d.	2050
Drought option - demand side (SHZ): Reduce transfer to other	0.05	Drought Option: In the event of a drought the Company would hold discussions with a commercial customer with regards to the resources position and their supply.	2027

Option name	Yield (Ml/d) (if applicable)	Description	Earliest year of implementation
commercial customers			
Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d)	3	The scheme involves the raising of Bewl Water, by 0.4m to increase storage and yield. The major works for raising Bewl to higher TWL levels will include: Raising the dam crest and building a new wave wall; Raising the overflow and valve chamber shafts and many ancillary works around the perimeter of the reservoir.	2061

Table 5-49 Visual evaluation matrix summary (post mitigation) for SHZ.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
Sussex Hastings (SHZ)	Drought option - demand side (SHZ): NEUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	-	0	0	0	0	0	0	-	-	---	--	0	0
Sussex Hastings (SHZ)	Drought option - demand side (SHZ): TUBs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	+	+	+	+	+	0	+	0
		Operation (negative)	0	0	0	0	0	0	0	0	-	-	--	-	0	0
Sussex Hastings (SHZ)	Groundwater (SHZ): Reconfigure Rye Wells (1.5Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	0	-	0	-	-	0	-	0	-	0	-	0
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (negative)	0	0	0	-	0	0	-	-	0	0	0	0	0	0
Sussex Hastings (SHZ)	Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	0	-	-	0	-	-	0	-	-	--	--	-	-
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	---	0	0	-	0	-	0	0	0	0	0
Sussex Hastings (SHZ)	Recycling (SHZ): Hastings to Darwell (15.3Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	-	--	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	+	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	---	0	0	-	0	0	0	0	0	0	0
Sussex Hastings (SHZ)	Bulk import(SHZ): SEW RZ8 to Rye	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	--	0	-	0	0	-	-	0	-	-	-	-	-	-

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WRZ	Option	Stages (post mitigation)	Biodiversity	Soils	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (positive)	0	0	0	0	+	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Sussex Hastings (SHZ)	Drought option - demand side (SHZ): Reduce transfer to other commercial customers	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	+	0	0	+	+	0	0	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	-	0	0	0	0	0	-	-	0	0
Sussex Hastings (SHZ)	Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	-	-	-	--	0	-	-	0	-	-	-	-	-	-
		Operation (positive)	0	0	0	0	+	0	0	+	0	0	0	0	0	0
		Operation (negative)	0	0	0	--	0	0	-	0	-	0	0	0	0	0

Construction effects

None of the options were identified as having positive or likely significant positive effects in the construction phase.

Three options (Drought option - demand side (SHZ): NEUBs, Drought option - demand side (SHZ): TUBs, and Drought option - demand side (SHZ): Reduce transfer to other commercial customers) were assessed as neutral effects during the construction phase, as they would involve operational changes only.

No significant negative effects were identified in the construction phase.

Bulk import (SHZ): SEW RZ8 to Rye was assessed as having a moderate negative effect on the biodiversity SEA objective as it would be situated within close proximity to two SSSIs (Leasam Heronry Wood and Brede Pit) which may be subject to disturbance effects from noise and dust on important species during construction. The option would also cross SSSI impact risk zone for Dungeness, Romney Marsh and Rye Bay SSSI where all planning applications have been highlighted as being a risk to the sensitive features for which the SSSI is notified. The HRA notes that adverse effects on Dungeness SAC and Dungeness, Romney Marsh and Rye Bay SPA will not occur or are clearly avoidable with scheme level measures.

Option Recycling (SHZ): Hastings to Darwell (15.3Ml/d) has been assessed as having a moderate negative effect on the water quality SEA objective as the option would overlay nitrate vulnerable zones, the Hastings Beds Cuckmere and Pevensey Levels, and Kent Weald Eastern - Rother WFD groundwater bodies. The option also intersects several surface water bodies, including main rivers, therefore there is potential for leaks and spills during construction that could contaminate the water environment which could be mitigated. Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d) was also identified as having moderate effects for the Water Quality SEA objective linked to the findings of the WFD assessment which identified WFD non-compliance (with low confidence) for Bewl Water (lake) and Bewl (river) waterbodies.

Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d)was assessed as having moderate negative effects on the health and wellbeing and tourism and recreation SEA objectives. This reflects the location in relation to a large number of facilities and services including play and sport facilities, which will likely be affected during construction.

No other moderate negative effects were identified during the assessment of the construction phase of the options. Groundwater (SHZ): Reconfigure Rye Wells (1.5Ml/d), Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d), Recycling (SHZ): Hastings to Darwell (15.3Ml/d), Bulk import (SHZ): SEW RZ8 to Rye,and Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d) were assessed as having a range of minor negative effects against the biodiversity, soils, geodiversity and land use, water resilience, water quality, air, carbon emissions, landscape, historic environment, health and wellbeing, tourism and recreation, resource use and built asset SEA objectives during the construction phase.

Operational effects

No significant positive effects were identified during assessment of the eight options for the operation phase. However, a range of minor positive effects were identified against the biodiversity, water quality, water reliability, carbon emissions, climate change, landscape, historic environment, health and wellbeing, and resource use SEA objectives.

For Drought option - demand side (SHZ): NEUBs, significant negative effects were identified for the health and wellbeing SEA objective during the operation phase. The ban carries the risk of economic impacts on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities). The ban may result in some business loss if the water-related operations have to be suspended. However, minor positive effects are also assessed for water savings which will help secure the supply of water to the communities in the WRZ. The Drought option - demand side (SHZ): TUBs was identified as having a moderate negative effect against this SEA objective through potentially limiting

water access during times of drought, compromising the sale of water consuming products and limiting the use of water.

Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d) and Recycling (SHZ): Hastings to Darwell (15.3Ml/d) were assessed as having significant negative effects on the water quality SEA objective during operation. This reflects that the WFD Stage 2 assessments (2025) conclude potential WFD non-compliance (with medium confidence) for the Bewl Water waterbody and the Darwell Reservoir waterbody respectively. In both cases, the WFD assessment highlights that a new discharge into the lake/reservoir could potentially change the physico-chemistry of the waterbodies.

Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d) was identified as having moderate negative effects on water quality in the operation phase. This relates to the findings of the WFD assessment which confirms WFD non-compliance (with low confidence) for Bewl Water (lake) and Bewl (river) waterbodies..

A range of minor negative effects were also identified against the soils, geodiversity and land use, water quality, water reliability, carbon emissions, climate change, landscape, historic environment, health and wellbeing, and tourism and recreation SEA objectives.

5.7 Assessment of the Effects of the Preferred Demand Management Options

Demand management is a key component of Southern Water's long-term water resources management strategy and will deliver significant benefits in all three supply areas (in terms of water resources, resilience and minimising the need for (and effects from) new supply options). Southern Water established a target of reducing average per capita consumption (PCC) across the operational area to 100l/h/d as part of the Target 100 (T100) commitment in WRMP19 which was reflected in the demand management option assessment in the SEA of Southern Water's WRMP19.

Revised household demand forecasts taking into account recent changes such as COVID_19, regulator feedback and further customer engagement has led to a refinement of the demand management options considered in WRMP19. Southern Water has identified seven 'catalysts' that are planned workstreams that will bring about a change in behaviour and practices among household customers, non-household customers and developers. These are summarised below.

1. **Communication and marketing**: Southern Water will use a sustained and multi-pronged awareness campaign to highlight the financial, social and environmental benefits of using less water. Southern Water will use this campaign to:
    a. Build awareness around water scarcity in the South East and the need to use water wisely
    b. Establish a water efficient culture as the norm
    c. Celebrate and encourage behaviour change.
2. **Deploy smart meters:** Southern Water are currently trialling 1,500 smart meters. Smart meters can record and transmit consumption data in near real-time and the information can facilitate proactive engagement with customers and help identify and fix supply-pipe leaks and plumbing losses earlier than Visual Meter Reads (VMR) and Automated Meter Reads (AMR) meters. Following completion of the trial, Southern Water plan to fully replace current VMRs and AMRs with smart meters by 2030.
3. **Tariffs:** Southern Water will use data from smart meters to trial different tariff structures, and use information from these trials to build awareness and readiness before introducing differential tariffs over time to delivery water savings.
4. **Water-saving solutions:** Southern Water intend to use smart meter data to optimise the use of water-saving devices or advice.

5. **Home audits:** Southern Water plan to carry out 10,000 home audits per year from 2025-26 to help customers reduce demand, using smart meter data and behavioural science approaches.
6. **Education:** Southern Water are commissioning classroom resources from curriculum specialists on water-saving and living efficiently for primary and secondary schools to embed water-efficient behaviour in our future customers - both at home and at work.
7. **Policy and regulation:** We are working with government policymakers, regulators, other water companies and wider stakeholders across the UK to develop and implement policies that promote water efficiency across all sectors.

These are then reflected in the following demand management options (to be applied across all resource zones), split between household and non-household interventions which have been assessed to identify potential significant effects:

- Policy Regulation;
- Home Visits;
- Water Audits (Non-Households);
- Enabler Activities Awareness Campaigns;
- Enabler Activities (Non-Households) Awareness Campaigns;
- Tariffs;
- Non-Households Tariffs;
- Water Efficiency Partnership Fund;
- Smart Metering
- Smart Metering USPL
- Smart Metering Unmeasured Households
- NHH Smart Meters.

In addition, a range of leakage management options have been identified.

Table 5-50 presents a summary of the 17 demand management and leakage options, which includes brief descriptions and a summary of the yield to be provided from the options implementation across the 14 WRZs.

When split across the 14 WRZs, there are total of 241 demand management and leakage options; however, to ensure a focus on identifying likely significant effects, consideration is given to the effects across all zones at the plan level. Table 5-51 present the summary results of the assessment with the full assessment for each option set out in Appendix I Constrained Options AssessmentsJ.

Table 5-50 Summary of options.

Option name	Yield (Ml/d)	Description
Policy Regulation	-	Implementation of changes to regulation and policy on building standards and appliances (All WRZs)
Home Visits	2.6	Water use audit and inspection - household
Water Audits (Non Households)	5.3	Water use audit and inspection - Non-household
Enabler Activities Awareness Campaigns	2.3	Targeted water conservation information (advice on appliance water usage)
Enabler Activities (Non Households) Awareness Campaigns	0.2	Targeted water conservation information (advice on appliance water usage)
Tariffs	7.5	Changes to existing measured tariffs - Volumetric charges
NHH Tariffs	2.1	Changes to existing measured tariffs - Volumetric charges
Water Efficiency Partnership Fund	0.2	Sponsoring Water efficiency enabling activities by others
Smart Metering	12.6	Enhanced metering - Household
Smart Metering USPL	2.8	Customer supply pipe leakage reduction
Smart Metering Unmeasured Households	0.0	Compulsory metering - Household
NHH Smart Metering	3.7	Enhanced metering - Non-household
Advanced Find & Fix	5.5	Leakage reduction - Active Leakage Control
Advanced Pressure Management	2.2	Leakage reduction - Pressure reduction programmes
Comms Pipe Replacement	1.8	Comms pipe leakage reduction
Digitalisation/Smart Networks	2.0	Leakage reduction - Active Leakage Control
Mains Replacement (Net of NNR)	14.0	Distribution Main Replacement

Table 5-51 Visual evaluation matrix summary (post mitigation) for the demand management options.

WRZ	Option	Stages (post mitigation)	Biodiversity	Soils, Geodiversity, Land Use	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
All	Policy Regulation	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+/?	0	+/?	+/?	0	0	+/?	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Home Visits	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	-	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Water Audits (Non-Households)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	-	--/?	0	0	0	0	0	--	0
		Operation (positive)	0	0	0	0	++	0	++	+	0	0	++	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Enabler Activities Awareness Campaigns	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	-	0	0	0	0	0	0	-	0
All	Enabler Activities (Non Households) Awareness Campaigns	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	-	0	0	0	0	-/?	0	0	0
All	Tariffs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	++	0	++	++	0	0	++	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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WRZ	Option	Stages (post mitigation)	Biodiversity	Soils, Geodiversity, Land Use	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
All	NHH Tariffs	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Water Efficiency Partnership Fund	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Smart Metering	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0
		Construction (negative)	0	0	0	0	0	--	---	0	0	0	0	0	---	0
		Operation (positive)	0	0	0	0	+++	0	+++	+++	0	0	+++	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Smart Metering USPL	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	-/?	-	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Smart Metering Unmeasured Households	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	NHH Smart Metering	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0
		Construction (negative)	0	0	0	0	0	-/?	--	0	0	0	0	0	--	0
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Advanced Find & Fix	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0
		Construction (negative)	-/?	0	0	0	0	-/?	--	0	0	0	-/?	0	--	-/?
		Operation (positive)	0	0	0	0	++	0	++	++	0	0	++	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Advanced Pressure Management	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0
		Construction (negative)	0	0	0	0	0	-/?	--	0	0	0	0	0	0	0

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WRZ	Option	Stages (post mitigation)	Biodiversity	Soils, Geodiversity, Land Use	Water			Air	Climatic Factors		Landscape	Historic Environment	Population & Human Health		Material Assets	
					Resilience	Quality	Reliability		Carbon emissions	Climate change			Health & well-being	Tourism & recreation	Resource use	Built assets
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Comms Pipe Replacement	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	+/?	0
		Construction (negative)	-/?	0	0	0	0	-/?	--	0	-/?	-/?	0	0	--	-/?
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Digitalisation/Smart Networks	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0
		Construction (negative)	0	0	0	0	0	-/?	---	0	0	0	-/?	0	---	0
		Operation (positive)	0	0	0	0	+	0	+	+	0	0	+	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All	Mains Replacement (Net of NRR)	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	+/?	0
		Construction (negative)	-/?	0	0	0	0	--/?	---	0	-/?	-/?	0	0	---	-/?
		Operation (positive)	0	0	0	0	+++	0	+++	+++	0	0	+++	0	0	0
		Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

5.7.1 Construction effects

Three of the 17 revised preferred demand management options (Smart Metering, Digitalisation/Smart Networks, and Mains Replacement (Net of NNR)) were identified as having significant positive effects against the health and wellbeing SEA objective during the construction phase. This is because the options would each result in a significant capital spend that would result in a significant positive effect on the local economy associated with supply chain benefits and spend by workers and contractors in the local economy. Of the remaining 14 options, four have been assessed as having a moderate positive effect against this objective, with the remainder assessed as neutral.

Two of the preferred demand management options (Comms Pipe Replacement, and Mains Replacement (Net of NNR)) have been assessed as having a minor positive uncertain effect against the Minimise Waste and Resource Use objective during the construction phase, due to the possibility for waste building materials construction to be re-used or recycled, though the scale of this is unknown. The remaining 15 preferred demand management options have been assessed as having a neutral effect against this objective.

No other positive effects have been assessed for any of the preferred demand management options, against other SEA objectives, during the construction phase.

Three of the 17 revised preferred demand management options (Smart Metering, Digitalisation/Smart Networks, and Mains Replacement (Net of NNR)) were identified as having significant negative effects against the carbon emissions SEA objective. Construction of these options would include embodied carbon associated with material production, transport and installation of smart meters, new devices, and replacement pipes. Due to the scale of these options, the effects have been assessed as significant. Of the remaining 14 options, five have been assessed as having a moderate negative effect against this objective, and one as having a minor effect, with the remainder assessed as neutral.

These three options have also been assessed as having significant negative effects against the resource use SEA objective. Construction of these options would require new equipment and replacement pipes, with only limited opportunities for the re-use or recycling of waste materials. Production and installation of smart meters and new devices may result in waste associated with manufacturing waste, packaging, materials required for installation and disposal of any faulty/damaged meters or old devices. Again, due to the scale of these options, significant negative effects have been assessed. Of the remaining 14 options, four have been assessed as having a moderate negative effect against this objective, and the remainder assessed as neutral.

No other significant positive effects have been assessed for any of the preferred demand management options during the construction phase, however a range of minor and moderate effects have been assessed against the biodiversity, air, landscape, historic environment, and built assets.

5.7.2 Operational effects

Two of the 17 preferred demand management options (Smart Metering and Mains Replacement (Net of NNR)) were identified as having significant positive effects against the water reliability SEA objective as they will provide water savings, contributing towards improving security of supply of water in the Southern Water supply region, supporting economic growth. Due to the magnitude of their respective yields this is considered to result in a significant positive effect on the local economy and social wellbeing. Of the remaining 15 options, three have been assessed as having a moderate positive effect against this objective, and 10 as having a minor effect, one as having a minor positive uncertain effect, with the remaining one assessed as neutral.

The two options, Smart Metering and Mains Replacement (Net of NNR) were also identified as having significant positive effects against the carbon emissions, climate change and health and wellbeing SEA objectives. These options have significant yields derived from demand management (>10Ml/d) and are therefore expected to reduce operational carbon emissions through reduced demand for energy to abstract,

treat, and transfer the water. Due to the significance of the yield and associated reduction, this is anticipated to have a significant positive effect on carbon emissions. The increased capacity provided by the reduction in demand would help to increase the resilience of supply, thereby increasing resilience and adaptability to the effects of climate change. Water savings will also contribute towards improving security of supply of water in the Southern Water region, supporting economic growth. Of the remaining 15 options, two have been assessed as having a moderate positive effect against all three objectives, one option was assessed as having a moderate positive effect on the carbon emissions and health and wellbeing SEA objectives, with a minor positive effect on the climate change SEA objective, nine options were assessed as having a minor positive effect across all three objectives, one option was assessed as having a minor positive effect against the carbon emissions and climate change SEA objectives (and a neutral effect on health and wellbeing SEA objective), one option was assessed as having a minor positive uncertain effect against all three objectives, with the remaining option being assessed as neutral against all three objectives.

No significant positive effects have been assessed for any of the preferred demand management options during the operational phase, against the remaining SEA objectives.

No significant negative effects have been assessed for any of the preferred demand management options during the operational phase. Minor negative effects were identified for two options, (Enabler Activities Awareness Campaigns and Enabler Activities (Non Households) Awareness Campaigns) against the air SEA objective and minor negative uncertain effects were assessed against the health and wellbeing SEA Objective for Enabler Activities (Non Households) Awareness Campaigns. Moderate negative effects were identified for the Water Audits (Non-Households) option against the resource use objective. Enabler Activities Awareness Campaigns was assessed as having a minor negative effect against this objective. No other negative effects were identified for the operational phase of the preferred demand management options.

5.8 Summary of Significant Effects by SEA Topic and Water Resource Zone (WRZ)

Significant effects have been recorded (**Appendix K and L**) from options proposed for all of the WRZs, as listed:

- Sussex North (SNZ);
- Sussex Worthing (SWZ);
- Sussex Brighton (SBZ);
- Hampshire Kingsclere (HKZ);
- Hampshire Andover (HAZ);
- Isle of Wight (IOW);
- Hampshire Rural (HRZ);
- Hampshire Winchester (HWZ);
- Hampshire Southampton East (HSE);
- Hampshire Southampton West (HSW);
- Kent Medway East (KME);
- Kent Medway West (KMW);
- Kent Thanet (KTZ); and
- Sussex Hastings (SHZ).

Significant positive effects which have been identified that relate to the operation phase and the delivery of **reliable water supplies**, associated with Hampshire Southampton East, Hampshire Winchester WRZs as follows:

- Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d);
- Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d);
- Bulk import (HWZ): T2ST to Yew Hill (95Ml/d)
- Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d);
- Drought option - supply side (HSW): River Test (80 Ml/d); and
- Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d)

Significant positive effects which have been identified that relate to the operation phase and **health and wellbeing**, associated with the Hampshire Southampton East WRZ as follows:

- Drought option - supply side (HSE): Lower Itchen.

In respect of significant negative effects, 11 relate to **biodiversity**, all in the operation phase, with Desalination (KTZ): East Thanet (20Ml/d) also having a significant negative uncertain effect during the construction phase, and all with a degree of uncertainty, relating to the Isle of Wight, Hampshire Southampton East, Kent Medway East, Kent Medway West, and Kent Thanet WRZ's:

- Drought option - supply side (IOW): Caul Bourne (1.5Ml/d);
- Drought option - supply side (HSE): Candover (22Ml/d);
- Drought option - supply side (HSE): Lower Itchen;
- Desalination (KME): Isle of Sheppey (10Ml/d) phase 2;
- Desalination (KME): Isle of Sheppey 20Ml/d;
- Desalination (KMW): Thames Estuary (10Ml/d);
- Desalination (KMW): Thames Estuary (10Ml/d) Phase 2;
- Desalination (KMW): Thames Estuary (20Ml/d);
- Desalination (KMW): Thames Estuary (20Ml/d) Phase 2;
- Desalination (KTZ): East Thanet (20Ml/d); and
- Desalination (KTZ): East Thanet (20Ml/d) Phase 2.

There are sevensignificant negative effects identified in respect of **Water Quality** (operation) in Sussex North, Sussex Hastings, Isle of Wight, Kent Medway East and Kent Medway West WRZ's:

- Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d);
- Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d);
- Recycling (SHZ): Hastings to Darwell (15.3Ml/d);
- Drought option - supply side (IOW): Caul Bourne (1.5Ml/d);
- Groundwater (KME): Recommission Gravesend (2.7Ml/d);
- Recycling (KMW): Medway WTW to lake (14Ml/d); and
- Drought option - supply side (KMW): River Medway Scheme 1-4 (17Ml/d)

There are fourteen significant negative effects relating to non-essential use bans in respect of **health and well-being** in the operation phase in relation to the following options

- Drought option - demand side (SNZ): NEUBs;
- Drought option - demand side (SWZ): NEUBs;
- Drought option - demand side (SBZ): NEUBs;
- Drought option - demand side (HKZ): NEUBs;
- Drought option - demand side (HAZ): NEUBs;
- Drought option - demand side (IOW): NEUBs;
- Drought option - demand side (HRZ): NEUBs;
- Drought option - demand side (HWZ): NEUBs;
- Drought option - demand side (HSE): NEUBs;
- Drought option - demand side (HSW): NEUBs;
- Drought option - demand side (KME): NEUBs;
- Drought option - demand side (KMW): NEUBs;
- Drought option - demand side (KTZ): NEUBs; and
- Drought option - demand side (SHZ): NEUBs..

Where residual significant negative effects have been identified, additional mitigation measures to those identified might have to be explored in order to try and reduce the scale and/or impacts of these effects, or alternative options explored.

Significant effects have also been identified across all 14 WRZ's, for the revised demand management and leakage options.

Significant positive effects which have been identified that relate to the construction phase and **health and wellbeing**, associated with the demand management and leakage options as follows:

- Smart Metering;
- Digitalisation/Smart Networks; and
- Mains Replacement (Net of NNR).

Significant negative effects which have been identified that relate to the construction phase and climatic factors (**carbon emissions**) associated with the demand management and leakage options as follows:

- Smart Metering;
- Digitalisation/Smart Networks; and
- Mains Replacement (Net of NNR).

Significant negative effects which have been identified that relate to the construction phase and **resource use**, associated with the demand management and leakage options as follows:

- Smart Metering;
- Digitalisation/Smart Networks; and
- Mains Replacement (Net of NNR).

Two significant positive effects have been identified that relate to the operation and the delivery of **reliable water supplies**, associated with the demand management and leakage options as follows:

- Smart Metering; and
- Mains Replacement (Net of NNR).

Two significant positive effects have also been identified that relate to operation and the **carbon emissions, climate change and health and wellbeing** SEA objectives, associated with the demand management and leakage options as follows:

- Smart Metering; and
- Mains Replacement (Net of NNR).

A summary table illustrating the identified significant effects is presented in **Appendix L** Summary of Post Mitigation Significant Effects by Water Resource Zone Options.

6 Cumulative effects assessment

6.1 Introduction

The cumulative assessments presented in this section have been carried out in line with the methodology described in Section 4 of this Report.

6.2 Cumulative intra-plan effects

6.2.1 Interactions between options

Error! Reference source not found. below identifies the options where the construction phases (within a 5-year period) overlap with one another o ption and where they fall within 10km of each other. It also identifies where options intersect in relation to key receptors. European sites are not included in the table below as these are addressed through the HRA in-combination assessment the findings for which are presented in Section 6.2.2. Similarly, waterbodies/ catchments are not included as these are addressed through the WFD assessment, which also carried out a cumulative effects assessment and the findings for which are presented in Section 6.2.3.

Table 6-1 Interactions between options

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
Groundwater (SNZ): New borehole at Petworth (4Ml/d) (2031)	Recycling (SNZ): Littlehampton WTW with river discharge (15Ml/d) (2031)	• Both within 500m of the South Downs National Park
	Groundwater (SNZ): Reinstate West Chiltington (3.1Ml/d) (2029)	N/A
Recycling (SNZ): Littlehampton WTW with river discharge (15Ml/d) (2031)	Groundwater (SNZ): New borehole at Petworth (4Ml/d) (2031)	• Both within 500m of the South Downs National Park
	Groundwater (SNZ): Reinstate West Chiltington (3.1Ml/d|) (2029)	N/A
Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) (2046)	Interzonal transfer (SBZ-SWZ): Brighton to Worthing (2041)	• Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (10Ml/d) (2046)	• Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (20Ml/d) (2041)	• Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2 (2050)	• Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Treatment capacity (SWZ): Pulborough winter transfer stage 1 (2Ml/d) (2041)	• Both within 500m of the South Downs National Park
	Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) (2041)	• Both within 500m of the South Downs National Park
Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d) (2040)	Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) (2035)	• Both within 500m of Leigh Park (Staunton Country Park) Registered Park and Garden • Both within 500m of Sir George Staunton Country Park Conservation Area • Both within 500m of the South Downs National Park
	Bulk import (SNZ): SEW RZ5 to Pulborough (2040)	• Both within 500m of the Roman mansio and settlement, 535m north-east of Penn House Scheduled Monument • Both cross the A285 and A286 • Both within 500m of the South Downs National Park
	Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) (2035)	• Both within 500m of Leigh Park (Staunton Country Park) Registered Park and Garden • Both within 500m of Sir George Staunton Country Park Conservation Area • Both within 500m of the South Downs National Park
	Interzonal transfer (SNZ-SWZ): Pulborough to Worthing (2040)	• Both within 500m of the Hardham Conservation Area • Both within 500m of the Hardham Priory Scheduled Monument and Roman mansio and settlement, 535m north-east of Penn House Scheduled Monument • Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (20Ml/d) (2041)	• Both within 500m of the South Downs National Park
Bulk import (SNZ): SEW RZ5 to Pulborough (2040)	Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d) (2040)	• Both within 500m of the Roman mansio and settlement, 535m north-east of Penn House Scheduled Monument • Both cross the A285 and A286 • Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Interzonal transfer (SNZ-SWZ): Pulborough to Worthing (2040)	• Both within 500m of the Roman mansio and settlement, 535m north-east of Penn House Scheduled Monument • Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (20Ml/d) (2041)	• Both within 500m of the South Downs National Park
Interzonal transfer (SNZ-SWZ): Pulborough to Worthing (2040)	Interzonal transfer (SBZ-SWZ): Brighton to Worthing (2041)	• Both within 500m of the South Downs National Park • Both within 500m of Cissbury Ring SSSI
	Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d) (2040)	• Both within 500m of Hardham Priory Scheduled Monument and Roman mansio and settlement, 535m north-east of Penn House Scheduled Monument • Both within 500m of Hardham Conservation Area • Both within 500m of the South Downs National Park
	Bulk import (SNZ): SEW RZ5 to Pulborough (2040)	• Both within 500m of the Roman mansio and settlement, 535m north-east of Penn House Scheduled Monument • Both within 500m of the South Downs National Park
	Treatment capacity (SWZ): Pulborough winter transfer stage 1 (2Ml/d) (2041)	• Both within 1000m of the Hillbarn Recreation Ground Historic Landfill • Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) (2041)	• Both within 1000m of the Hillbarn Recreation Ground Historic Landfill • Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (20Ml/d) (2041)	• Both within 500m of the South Downs National Park
Desalination (SWZ): Tidal River Arun (10Ml/d) (2046)	Interzonal transfer (SBZ-SWZ): Brighton to Worthing (2041)	• Both cross the A27 • Both within 500m of the South Downs National Park
	Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) (2046)	• Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (20Ml/d) (2041)	• Both within 50 of an area of Ancient Woodland (1476116) • Both within 500m of A19th century artillery fort known as Littlehampton Fort, 317m south west of the Windmill Theatre, Burpham camp, Ringwork 400m NNW of Batworthpark House, Medieval earthworks E and SE of St Mary's Church and Tortington Augustinian priory and ponds, including part of priory precinct Scheduled Monuments • Both cross the A259 and the A27 • Both within 1000m of the Bank East of Hanger 2, Brookbarn Farm, Canada Road Historic Landfill, Climping, Disused Canal at Yapton, Fagins Den, Ferry Road North, Ford Prison, Littlehampton Ferry Road South, Littlehampton Marina Extension, Mewsbrook, Newhouse and Penfold Works Historic Landfill sites • Both within 20m of Brookpits Cottage Listed Building

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within 500m of Burpham and Wepham, Littlehampton (East Street), Littlehampton (River Road), Littlehampton (Seafront) and Warningcamp Conservation Areas. • Both within 500m of Climping Beach SSSI • Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2 (2050)	• Both within 50 of an area of Ancient Woodland (1476116) • Both within 500m of A19th century artillery fort known as Littlehampton Fort, 317m south west of the Windmill Theatre, Burpham camp, Ringwork 400m NNW of Batworthpark House, Medieval earthworks E and SE of St Mary's Church and Tortington Augustinian priory and ponds, including part of priory precinct Scheduled Monuments • Both cross the A259 and the A27 • Both within 1000m of the Bank East of Hanger 2, Brookbarn Farm, Canada Road Historic Landfill, Climping, Disused Canal at Yapton, Fagins Den, Ferry Road North, Ford Prison, Littlehampton Ferry Road South, Littlehampton Marina Extension, Mewsbrook, Newhouse and Penfold Works Historic Landfill sites • Both within 20m of Brookpits Cottage Listed Building • Both within 500m of Burpham and Wepham, Littlehampton (East Street), Littlehampton (River Road), Littlehampton (Seafront) and Warningcamp Conservation Areas. • Both within 500m of Climping Beach SSSI • Both within 500m of the South Downs National Park
Treatment capacity (SWZ): Pulborough winter transfer stage 1 (2Ml/d) (2041)	Interzonal transfer (SBZ-SWZ): Brighton to Worthing (2041)	• Both cross the A27 and the A283 • Both within 500m of the Adur Estuary SSSI • Both within 1000m of the Halewick Lane Tip, Mile Oak Recreation Ground, New Barn Farm, Southwick Hill, Sussex Pad and Waterhall Valley Landfill Historic Landfill sites. • Both within 500m of the Section of Port's Road and barrow on Round Hill, Hangleton Scheduled Monument • Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) (2046)	• Both within 500m of the South Downs National Park
	Interzonal transfer (SNZ-SWZ): Pulborough to Worthing (2040)	• Both within 1000m of the Hillbarn Recreation Ground Historic Landfill • Both within 500m of the South Downs National Park
	Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) (2041)	• Both cross the A27 and the A283 • Both within 500m of the Adur Estuary SSSI • Both within 500m of the Benfield Barn, Hangleton, Patcham and Woodland Drive Conservation Areas • Both within 1000m of the Decoy Farm Historic Landfill, Dyke Railway Cuttings, Halewick Lane Tip, Hillbarn Recreation Ground, Mile Oak Recreation Ground, New Barn Farm, Southwick Hill, Sussex Pad and Waterhall Valley Landfill Historic Landfill sites. • Both within 500m of the Section of Port's Road and barrow on Round Hill, Hangleton and the Shoreham Airfield dome trainer, 240m south west of Sussex Pad Hotel Scheduled Monuments • Both within 500m of the South Downs National Park • Both intersect the Worthing Grove Lodge/Lyons Farm AQMA
Interzonal transfer (SBZ-SWZ): Brighton to Worthing (2041)	Desalination (SWZ): Tidal River Arun (10Ml/d) (2046)	• Both cross the A27 • Both within 500m of the South Downs National Park
	Desalination (SWZ): Tidal River Arun (20Ml/d) (2041)	• Both cross the A27 • Both within 500m of the South Downs National Park
	Treatment capacity (SWZ): Pulborough winter transfer stage 1 (2Ml/d) (2041)	• Both cross the A27 and the A283 • Both within 500m of the Adur Estuary SSSI • Both within 1000m of the Halewick Lane Tip, Mile Oak Recreation Ground, New Barn Farm, Southwick Hill, Sussex Pad and Waterhall Valley Landfill Historic Landfill sites.

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within 500m of the Section of Port's Road and barrow on Round Hill, Hangleton Scheduled Monument • Both within 500m of the South Downs National Park
	Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) (2041)	• Both Cross the A27 and the A283 • Both within 500m of the Adur Estuary SSSI • Both within 1000m of the Halewick Lane Tip, Mile Oak Recreation Ground, New Barn Farm, Southwick Hill, Sussex Pad and Waterhall Valley Landfill Historic Landfill sites • Both within 500m of the Section of Port's Road and barrow on Round Hill, Hangleton Scheduled Monument • Both within 500m of the South Downs National Park
	Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) (2046)	• Both within 500m of the South Downs National Park
	Interzonal transfer (SNZ-SWZ): Pulborough to Worthing (2040)	• Both within 500m of the Cissbury Ring SSSI • Both within 500m of the South Downs National Park
Groundwater (HKZ): Remove constraints at Newbury to increase yield (1.2Ml/d) (2028)	Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) (2031)	• Both cross the A34 Road • Both within 500m of the North Wessex Downs National Landscape
	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d)	• Both cross the A34 Road • Both within 500m of the North Wessex Downs National Landscape

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d) (2031)	Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) (2026)	N/A
	Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) (2031)	N/A
	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	N/A
	Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) (2031)	N/A
	Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d) (2031)	N/A
	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) (2031)	N/A
Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d) (2032)	Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) (2035)	• Both within 1000m of the Bugle Farm, adjacent to Brambridge Road, the Former Dell West Of Fairfield Road, the Hill Lane - Spring Lane, the Land Between Brambridge Road and Kiln Lane, the Land East Of Brambridge Road, the Land East of M3 motorway and West Of Otterbourne, the Land South Of Poles Lane, the North of Vears Lane, the Otterbourne Pumping Station and the Upper Moors Road Historic Landfill sites • Both within 500m of the Moated site at Otterbourne Manor Scheduled Monument • Both within 500m of the River Itchen SSSI • Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne, Land South of Poles Lane, and Otterbourne Pumping Station Historic Landfill sites • Both within 500m of South Downs National Park
	Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) (2035)	• Both within 1000m of the Bugle Farm, adjacent to Brambridge Road, the Former Dell West Of Fairfield Road, the Hill Lane - Spring Lane, the Land Between Brambridge Road and Kiln Lane, the Land East Of Brambridge Road, the Land East of M3 motorway and West Of Otterbourne, the Land South Of Poles Lane, the North of Vears Lane, the Otterbourne Pumping Station and the Upper Moors Road Historic Landfill sites. • Both within 500m of the Moated site at Otterbourne Manor Scheduled Monument • Both within 500m of the River Itchen SSSI • Both within 500m of the South Downs National Park
	Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) (2031)	• Both within 1000m of the Former Dell West Of Fairfield Road, the Land East of M3 motorway and West Of Otterbourne, the Land South Of Poles Lane and the Otterbourne Pumping Station Historic Landfill sites • Both within 500m of the River Itchen SSSI • Both within 500m of the South Downs National Park
	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) (2031)	• Both within 100m of the Former Dell West Of Fairfield Road, the Land East of M3 motorway and West Of Otterbourne, the Land South Of Poles Lane and the Otterbourne Pumping Station Historic Landfill sites • Both within 500m of the River Itchen SSSI • Both within 500m of the South Downs National Park
Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) (2035)	Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d) (2040)	• Both within 500m of Leigh Park (Staunton Country Park) Registered Park and Garden • Both within 500m of Sir George Staunton Country Park Conservation Area • Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne,Land South of Poles Lane, and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of South Downs National Park • Both cross the A27
	Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) (2035)	• Both within 500m of the River Itchen SSSI • Both within 50m of Ancient Woodland (1490836 and 1490882) • Both within 1000m of Ash House Farm, Bugle Farm, adjacent to Brambridge Road, Crowd Hill, Former Dell West of Fairfield Road, Harts Farm Way, Hill Lane - Spring Lane, Kennel Farm, Land between Brambridge Road and Kiln Lane, Land East of Brambridge Road, Land East of M3 motorway and West of Otterbourne, Land South of Budds Farm Sewage Works, Land South of Poles Lane, North of Vears Lane, Otterbourne Pumping Station, Roughay Farm, Scratchface Lane, Tip rear of Parish Church, Upper Moors Road, and Water Treatment Works Historic Landfill Sites • Both within 1000m of Portsmouth Water Limited Authorised Landfill Site • Both within 500m of Moated site at Marwell Manor, Moated site at Otterbourne Manor, Park pale at Marwell, 250m north-west of Marwell Manor, Park pale at Marwell, 400m West of Marwell Manor, and Park pale at Marwell, South of Fisher's Pond Scheduled Monuments • Both within 500m of Sir George Staunton Country Park Conservation Area • Both within 500m of Leigh Park (Staunton Country Park) Registered Park or Garden • Both within 500m of the South Downs National Park • Both cross the A3, A3(M) and A32

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) (2031)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne, Land South of Poles Lane and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of the South Downs National Park
	Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d) (2032)	• Both within 1000m of the Bugle Farm, adjacent to Brambridge Road, the Former Dell West Of Fairfield Road, the Hill Lane - Spring Lane, the Land Between Brambridge Road and Kiln Lane, the Land East Of Brambridge Road, the Land East of M3 motorway and West Of Otterbourne, the Land South Of Poles Lane, the North of Vears Lane, the Otterbourne Pumping Station and the Upper Moors Road Historic Landfill sites • Both within 500m of the Moated site at Otterbourne Manor Scheduled Monument • Both within 500m of the River Itchen SSSI • Both within 500m of the South Downs National Park
	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) (2031)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway, West of Otterbourne and Land South of Poles Lane and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of the South Downs National Park
	Bulk import (HWZ): T2ST to Yew Hill (95Ml/d) (2040)	N/A
Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) (2035)	Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d) (2040)	• Both within 500m of Leigh Park (Staunton Country Park) Registered Park and Garden • Both within 500m of Sir George Staunton Country Park Conservation Area • Both within 500m of the South Downs National Park
	Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) (2035)	• Both within 500m of the River Itchen SSSI • Both within 50m of Ancient Woodland (1490836 and 1490882)

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within 1000m of Ash House Farm, Bugle Farm, adjacent to Brambridge Road, Crowd Hill, Former Dell West of Fairfield Road, Harts Farm Way, Hill Lane - Spring Lane, Kennel Farm, Land between Brambridge Road and Kiln Lane, Land East of Brambridge Road, Land East of M3 motorway and West of Otterbourne, Land South of Budds Farm Sewage Works, Land South of Poles Lane, North of Vears Lane, Otterbourne Pumping Station, Roughay Farm, Scratchface Lane, Tip rear of Parish Church, Upper Moors Road, and Water Treatment Works Historic Landfill Sites • Both within 1000m of Portsmouth Water Limited Authorised Landfill Site • Both within 500m of Moated site at Marwell Manor, Moated site at Otterbourne Manor, Park pale at Marwell, 250m north-west of Marwell Manor, Park pale at Marwell, 400m West of Marwell Manor, and Park pale at Marwell, South of Fisher's Pond Scheduled Monuments • Both within 500m of Sir George Staunton Country Park Conservation Area • Both within 500m of Leigh Park (Staunton Country Park) Registered Park or Garden • Both within 500m of the South Downs National Park • Both cross the A3, A3(M) and A32
	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne, Land South of Poles Lane, and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of South Downs National Park
	Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) (2031)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne, Land South of Poles Lane and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) (2031)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway, West of Otterbourne and Land South of Poles Lane and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of the South Downs National Park
	Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d) (2032)	• Both within 1000m of the Bugle Farm, adjacent to Brambridge Road, the Former Dell West Of Fairfield Road, the Hill Lane - Spring Lane, the Land Between Brambridge Road and Kiln Lane, the Land East Of Brambridge, the Land East of M3 motorway and West Of Otterbourne, the Land South Of Poles Lane, the North of Vears Lane, the Otterbourne Pumping Station and the Upper Moors Road Historic Landfill sites • Both within 500m of the Moated site at Otterbourne Manor Scheduled Monument • Both within 500m of the River Itchen SSSI • Both within 500m of the South Downs National Park
	Bulk import (HWZ): T2ST to Yew Hill (95Ml/d) (2040)	N/A
Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) (2031)	Groundwater (HKZ): Remove constraints at Newbury to increase yield (1.2Ml/d) (2028)	• Both cross the A34 • Both within the North Wessex Downs National Landscape
	Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) (2035)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne, Land South of Poles Lane and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	• Both within 500m of Bransbury Common, the River Itchen, and the River Test SSSI • Both within 50m of ancient woodland (1490866) • Both within 1000m of Disused Pits, Former Dell West of Fairfield Road, Land adjacent to Otterbourne Incinerator, Land East of M3 motorway and West of Otterbourne and Land South of Poles Lane, Old Winton Road and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of Bowl barrow 630m NNE of Littleton House and Three round barrows 500m WNW of Flowerdown House Scheduled Monuments • Both within 500m of Littleton Conservation Area • Both within 500m of Lainston House Registered Park or Garden • Both within 500m of the South Downs National Park • Both cross the A30, A303 and M3
	Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) (2035)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne, Land South of Poles Lane and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of South Downs National Park
	Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d) (2031)	N/A
	Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d) (2032)	• Both within 1000m of the Former Dell West Of Fairfield Road, the Land East of M3 motorway and West Of Otterbourne, the Land South Of Poles Lane and the Otterbourne Pumping Station Historic Landfill sites • Both within 500m of the River Itchen SSSI • Both within 500m of the South Downs National Park
	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) (2031)	• Both within 50m of five areas of Ancient Woodland (1487254, 1489714, 1489887, 1490866 and 1490897) • Both cross the A30, A303, A3090, A3093, A34 and M3 • Both within 500m of the Bowl barrow 630m NNE of Littleton House, Devil's Ditch within Pepper Hill Firs, Long barrow 300m

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		south-east of Middlebarn Farm, Long barrow 650m south-east of Ridgeway Farm, Long barrow and adjacent bowl barrow 500m south-west of Twinley Manor, Settlement site at Brockley Warren, Three barrows SW of Newton Down Farm, Three round barrows 500m WNW of Flowerdown House, Two bowl barrows 120m north-west of Texas and Two round barrows on Crawley Down, 830m NNE of Warren House Scheduled Monuments • Both within 500m of the Bransbury Common, River Itchen and River Test SSSIs • Both within 500m of the Chilbolton, Hurstbourne Priors, Kingsclere, Littleton, Wherwell and Compton Street Conservation Areas • Both within 1000m of the Cliffeville Limited Permitted Landfill • Both within 500m of the Compton End, Lainston House and Hurstbourne Park Registered Park and Garden • Both within 1000m of the Dismantled Railway Cutting Historic Landfill, Disused Cutting North of Whitchurch Station, Disused Pits, Former Dell West Of Fairfield Road, Land Adjacent to Otterbourne Incinerator, Land at Railway Cutting, Land East of M3 motorway and West Of Otterbourne, Land South Of Poles Lane, Old Chalk Pit, Old Winton Road, Otterbourne Pumping Station and Yew Tree Farm Historic Landfill • Both within 500m of the North Wessex Downs National Landscape • Shepherds Cottages and Whitehouse Listed Buildings • Both within 500m of the South Downs National Park
Groundwater (HSW): Test MAR (5.5Ml/d) (2036)	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	• Both within 500m of the River Test SSSI
	Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) (2031)	N/A

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) (2026)	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	N/A
	Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d) (2031)	N/A
	Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d) (2031)	N/A
	Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) (2031)	• Both within 500m of Broadlands Registered Park and Garden • Both within 500m of Romsey Conservation Area
Recycling (KME): Sittingbourne Industrial Water Reuse (7.5Mld) (2031)	Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d) (2026)	• Both cross the A2
Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d) (2026)	Recycling (KME): Sittingbourne Industrial Water Reuse (7.5Mld) (2031)	• Both cross the A2
	Bulk import (KTZ): SEW Kingston to Near Canterbury (2Ml/d) (2026)	• Both cross the A2 • Both within the Kent Downs National Landscape
Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d) (2040)	Desalination (KTZ): East Thanet (20Ml/d) (2041)	• Both cross the A28 Road • Both within 1000m of the Cheesemans Farm, the Manston Road, the Sunnybank and the Vincent Road Historic Landfill sites
Desalination (KMW): Thames Estuary (20Ml/d) (2040)	Desalination (KMW): Thames Estuary (10Ml/d) (2041)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
	Desalination (KMW): Thames Estuary (10Ml/d) Phase 2 (2041)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
	Desalination (KMW): Thames Estuary (20Ml/d) Phase 2 (2040)	• Both cross the A2, A226 and A227 Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
Recycling (KMW): Medway WTW to lake (14Ml/d) (2031)	Asset enhancement (KMW): Remove network constraint at Longfield (13Ml/d) (2026)	N/A
Asset enhancement (KMW): Remove network constraint at Longfield (13Ml/d) (2026)	Recycling (KMW): Medway WTW to lake (14Ml/d) (2031)	N/A
Bulk import (KTZ): SEW Kingston to Near Canterbury (2Ml/d) (2026)	Interzonal transfer (KME-KTZ): KME-KTZ bi-directional (15.8Ml/d) (2026)	• Both cross the A2 • Both within the Kent Downs National Landscape
Desalination (KTZ): East Thanet (20Ml/d) (2041)	Interzonal transfer (KTZ-KME): Utilise full existing transfer capacity (9Ml/d) (2040)	• Both cross the A28 Road • Both within 1000m of the Cheesemans Farm, the Manston Road, the Sunnybank and the Vincent Road Historic Landfill sites
Recycling (SHZ): Hastings to Darwell (15.3Ml/d) (2051)	Bulk import(SHZ): SEW RZ8 to Rye (2050)	• Both within 500m of High Weald National Landscape
Bulk import(SHZ): SEW RZ8 to Rye (2050)	Recycling (SHZ): Hastings to Darwell (15.3Ml/d) (2051)	• Both within 500m of High Weald National Landscape
Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) (2026)	N/A
	Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) (2031)	N/A
	Groundwater (HSW): Test MAR (5.5Ml/d) (2036)	• Both within 500m of the River Itchen SSSI
	Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) (2035)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne,Land South of Poles Lane, and Otterbourne Pumping Station Historic Landfill Sites

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within 500m of South Downs National Park • Both cross the A27
	Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) (2035)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne, Land South of Poles Lane, and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of South Downs National Park
	Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d) (2031)	N/A
	Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) (2031)	• Both within 500m of Bransbury Common, the River Itchen, and the River Test SSSI • Both within 50m of ancient woodland (1490866) • Both within 1000m of Disused Pits, Former Dell West of Fairfield Road, Land adjacent to Otterbourne Incinerator, Land East of M3 motorway and West of Otterbourne and Land South of Poles Lane, Old Winton Road and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of Bowl barrow 630m NNE of Littleton House and Three round barrows 500m WNW of Flowerdown House Scheduled Monuments • Both within 500m of Littleton Conservation Area • Both within 500m of Lainston House Registered Park or Garden • Both within 500m of the South Downs National Park • Both cross the A30, A303 and M3
	Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d) (2032)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway and West of Otterbourne, Land South of Poles Lane, and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d) (2031)	• Both within 500m of the River Test SSSI
	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) (2031)	• Both within 50m of an area of Ancient Woodland (1490866) • Both cross the A30, A303 and M3 • Both within 500m of the Bowl barrow 630m NNE of Littleton House and Three round barrows 500m WNW of Flowerdown House Scheduled Monuments • Both within 500m of the Bransbury Common, River Itchen and River Test SSSI • Both within 1000m of the Disused Pits, Former Dell West Of Fairfield Road, Land Adjacent to Otterbourne Incinerator, Land East of M3 motorway and West Of Otterbourne, Land South Of Poles Lane, Otterbourne Pumping Station and Old Winton Road Historic Landfill sites • Both within 500m of Lainston House Registered Park and Garden • Both within 500m of the Littleton Conservation Area • Both within 500m of the South Downs National Park
Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d) (2031)	Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) (2026)	N/A
	Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) (2031)	N/A
	Interzonal transfer (HWZ-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	• Both within 500m of the River Test SSSI
	Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d) (2031)	N/A

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
Groundwater (IOW): New borehole at Eastern Yar3 (1.5Ml/d) (2040)	Bulk import (HWZ): T2ST to Yew Hill (95Ml/d) (2040)	• Both within 500m of A cross dyke and bowl barrow on the northern spur of Beacon Hill and Large univallate hillfort at Beacon Hill Scheduled Monuments • Both within 500m of Burghclere Beacon and Highclere Park SSSIs • Both within 500m of Highclere Park Registered Park and Garden • Both within 500m of the North Wessex Downs National Landscape • Both within 1000m of the Woodham House Historic Landfill site
Desalination (KME): Isle of Sheppey 20Ml/d (2041)	No match	N/A
Desalination (KMW): Thames Estuary (10Ml/d) (2041)	Desalination (KMW): Thames Estuary (20Ml/d) (2040)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
	Desalination (KMW): Thames Estuary (10Ml/d) Phase 2 (2041)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
	Desalination (KMW): Thames Estuary (20Ml/d) Phase 2 (2040)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d) (2031)	Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) (2035)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway, West of Otterbourne and Land South of Poles Lane and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of the South Downs National Park
	Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) (2035)	• Both within 500m of the River Itchen SSSI • Both within 1000m of Former Dell West of Fairfield Road, Land East of M3 motorway, West of Otterbourne and Land South of Poles Lane and Otterbourne Pumping Station Historic Landfill Sites • Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Interzonal transfer (HSE-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	• Both within 50m of an area of Ancient Woodland (1490866) • Both cross the A30, A303 and M3 • Both within 500m of the Bowl barrow 630m NNE of Littleton House and Three round barrows 500m WNW of Flowerdown House Scheduled Monuments • Both within 500m of the Bransbury Common, River Itchen and River Test SSSI • Both within 1000m of the Disused Pits, Former Dell West Of Fairfield Road, Land Adjacent to Otterbourne Incinerator, Land East of M3 motorway and West Of Otterbourne, Land South Of Poles Lane, Otterbourne Pumping Station and Old Winton Road Historic Landfill sites • Both within 500m of Lainston House Registered Park and Garden • Both within 500m of the Littleton Conservation Area • Both within 500m of the South Downs National Park
	Interzonal transfer (HSE-HWZ): Otterbourne WSW to Yew Hill bi-directional (74Ml/d) (2031)	• Both within 50m of five areas of Ancient Woodland (1487254, 1489714, 1489887, 1490866 and 1490897) • Both cross the A30, A303, A3090, A3093, A34 and M3 • Both within 500m of the Bowl barrow 630m NNE of Littleton House, Devil's Ditch within Pepper Hill Firs, Long barrow 300m south-east of Middlebarn Farm, Long barrow 650m south-east of Ridgeway Farm, Long barrow and adjacent bowl barrow 500m south-west of Twinley Manor, Settlement site at Brockley Warren, Three barrows SW of Newton Down Farm, Three round barrows 500m WNW of Flowerdown House, Two bowl barrows 120m north-west of Texas and Two round barrows on Crawley Down, 830m NNE of Warren House Scheduled Monuments • Both within 500m of the Bransbury Common, River Itchen and River Test SSSIs • Both within 500m of the Chilbolton, Hurstbourne Priors, Kingsclere, Littleton, Wherwell and Compton Street Conservation Areas • Both within 1000m of the Cliffeville Limited Permitted Landfill

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within 500m of the Compton End, Lainston House and Hurstbourne Park Registered Park and Garden • Both within 1000m of the Dismantled Railway Cutting Historic Landfill, Disused Cutting North of Whitchurch Station, Disused Pits, Former Dell West Of Fairfield Road, Land Adjacent to Otterbourne Incinerator, Land at Railway Cutting, Land East of M3 motorway and West Of Otterbourne, Land South Of Poles Lane, Old Chalk Pit, Old Winton Road, Otterbourne Pumping Station and Yew Tree Farm Historic Landfill • Both within 500m of the North Wessex Downs National Landscape • Shepherds Cottages and Whitehouse Listed Buildings • Both within 500m of the South Downs National Park
	Bulk import (HSE): PWC Source A to Otterbourne WSW (21Ml/d) (2032)	• Both within 100m of the Former Dell West Of Fairfield Road, the Land East of M3 motorway and West Of Otterbourne, the Land South Of Poles Lane and the Otterbourne Pumping Station Historic Landfill sites • Both within 500m of the River Itchen SSSI • Both within 500m of the South Downs National Park
	Groundwater (HKZ): Remove constraints at Newbury to increase yield (1.2Ml/d) (2028)	• Both cross the A34 Road at distances of 0.0m and 0.0m • Both within 500m of the North Wessex Downs National Landscape
	Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d) (2031)	N/A
Interzonal transfer (SWZ-SBZ): Pulborough winter transfer stage 2 (4Ml/d) (2041)	Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) (2046)	• Both within 500m of the South Downs National Park
	Treatment capacity (SWZ): Pulborough winter transfer stage 1 (2Ml/d) (2041)	• Both cross the A27 and the A283 • Both within 500m of the Adur Estuary SSSI • Both within 500m of the Benfield Barn, Hangleton, Patcham and Woodland Drive Conservation Areas • Both within 1000m of the Decoy Farm Historic Landfill, Dyke Railway Cuttings, Halewick Lane Tip, Hillbarn Recreation Ground, Mile Oak Recreation Ground, New Barn Farm,

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		Southwick Hill, Sussex Pad and Waterhall Valley Landfill Historic Landfill sites. • Both within 500m of the Section of Port's Road and barrow on Round Hill, Hangleton and the Shoreham Airfield dome trainer, 240m south west of Sussex Pad Hotel Scheduled Monuments • Both within 500m of the South Downs National Park • Both intersect the Worthing Grove Lodge/Lyons Farm AQMA
	Interzonal transfer (SBZ-SWZ): Brighton to Worthing (2041)	• Both Cross the A27 and the A283 • Both within 500m of the Adur Estuary SSSI • Both within 1000m of the Halewick Lane Tip, Mile Oak Recreation Ground, New Barn Farm, Southwick Hill, Sussex Pad and Waterhall Valley Landfill Historic Landfill sites • Both within 500m of the Section of Port's Road and barrow on Round Hill, Hangleton Scheduled Monument • Both within 500m of the South Downs National Park
	Interzonal transfer (SNZ-SWZ): Pulborough to Worthing (2040)	• Both within 1000m of the Hillbarn Recreation Ground Historic Landfill • Both within 500m of the South Downs National Park
Groundwater (SNZ): Reinstate West Chiltington (3.1Ml/d) (2029)	Recycling (SNZ): Littlehampton with direct river discharge (15Ml/d) (2031)	N/A
	Groundwater (SNZ): New borehole at Petworth (4Ml/d) (2031)	N/A
Desalination (KMW): Thames Estuary (10Ml/d) Phase 2 (2041)	Desalination (KMW): Thames Estuary (20Ml/d) (2040)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
	Desalination (KMW): Thames Estuary (10Ml/d) (2041)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
	Desalination (KMW): Thames Estuary (20Ml/d) Phase 2 (2040)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
Desalination (KMW): Thames Estuary (20Ml/d) Phase 2 (2040)	Desalination (KMW): Thames Estuary (20Ml/d) (2040)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
	Desalination (KMW): Thames Estuary (10Ml/d) (2041)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites • Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
	Desalination (KMW): Thames Estuary (10Ml/d) Phase 2 (2041)	• Both cross the A2, A226 and A227 • Both within 1000m of the Alkerden Lane, Bamber Pit, Botany Road Historic Landfill, Broadness, Craylands Lane, Southfleet Pit, Southpit, Swanscombe Cement and Tollgate Stables Historic Landfill sites

WATER for LIFE from Southern Water

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
		• Both within the Dartford AQMA No.2 and Northfleet Industrial Area AQMA • Both within 1000m of the London Resort Company Holdings Limited, Swanscombe Development LLP, South Pit Phase 3 and Tarmac Cement Limited Permitted Landfill sites • Both within 500m of the Neolithic sites near Ebbsfleet, the Palaeolithic sites near Baker's Hole and Springhead Roman site Scheduled Monuments • Both within 500m of the Southfleet Conservation Area • Both within 500m of the Swanscombe Peninsula SSSI
Desalination (SWZ): Tidal River Arun (20Ml/d) (2041)	Desalination (SWZ): Tidal River Arun (10Ml/d) (2046)	• Both within 50 of an area of Ancient Woodland (1476116) • Both within 500m of A19th century artillery fort known as Littlehampton Fort, 317m south west of the Windmill Theatre, Burpham camp, Ringwork 400m NNW of Batworthpark House, Medieval earthworks E and SE of St Mary's Church and Tortington Augustinian priory and ponds, including part of priory precinct Scheduled Monuments • Both cross the A259 and the A27 • Both within 1000m of the Bank East of Hanger 2, Brookbarn Farm, Canada Road Historic Landfill, Climping, Disused Canal at Yapton, Fagins Den, Ferry Road North, Ford Prison, Littlehampton Ferry Road South, Littlehampton Marina Extension, Mewsbrook, Newhouse and Penfold Works Historic Landfill sites • Both within 20m of Brookpits Cottage Listed Building • Both within 500m of Burpham and Wepham, Littlehampton (East Street), Littlehampton (River Road), Littlehampton (Seafront) and Warningcamp Conservation Areas. • Both within 500m of Climping Beach SSSI • Both within 500m of the South Downs National Park
	Interzonal transfer (SNZ-SWZ): Pulborough to Worthing (2040)	• Both within 500m of the South Downs National Park
	Bulk import (SNZ): Havant Thicket Reservoir to Pulborough (50Ml/d) (2040)	• Both within 500m of the South Downs National Park

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) (2046)	• Both within 500m of the South Downs National Park
	Bulk import (SNZ): SEW RZ5 to Pulborough (2040)	• Both within 500m of the South Downs National Park
	Interzonal transfer (SBZ-SWZ): Brighton to Worthing (2041)	• Both within 500m of the South Downs National Park • Both cross the A27
Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2 (2050)	Desalination (SWZ): Tidal River Arun (10Ml/d) (2046)	• Both within 50 of an area of Ancient Woodland (1476116) • Both within 500m of A19th century artillery fort known as Littlehampton Fort, 317m south west of the Windmill Theatre, Burpham camp, Ringwork 400m NNW of Batworthpark House, Medieval earthworks E and SE of St Mary's Church and Tortington Augustinian priory and ponds, including part of priory precinct Scheduled Monuments • Both cross the A259 and the A27 • Both within 1000m of the Bank East of Hanger 2, Brookbarn Farm, Canada Road Historic Landfill, Climping, Disused Canal at Yapton, Fagins Den, Ferry Road North, Ford Prison, Littlehampton Ferry Road South, Littlehampton Marina Extension, Mewsbrook, Newhouse and Penfold Works Historic Landfill sites • Both within 20m of Brookpits Cottage Listed Building • Both within 500m of Burpham and Wepham, Littlehampton (East Street), Littlehampton (River Road), Littlehampton (Seafront) and Warningcamp Conservation Areas. • Both within 500m of Climping Beach SSSI • Both within 500m of the South Downs National Park
	Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) (2046)	• Both within 500m of the South Downs National Park
Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve expansion (5Ml/d) (2031)	Interzonal transfer (HRZ-HSW): Romsey Town and Broadlands valve (3.1Ml/d) (2026)	• Both within 500m of Broadlands Registered Park and Garden • Both within 500m of Romsey Conservation Area
	Interzonal transfer (HSE-HSW): Yew Hill WSW to River Test WSW bi-directional (60Ml/d) (2031)	N/A

WATER for LIFE from Southern Water

Option	Options where the construction phase overlaps and they are within 10km of each other	Is there potential for the options to interact with the same receptor?
	Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d) (2031)	N/A
	Groundwater (HSW): Test MAR (5.5Ml/d) (2036)	N/A
	Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d) (2031)	N/A
Bulk import (HWZ): T2ST to Yew Hill (95Ml/d) (2040)	Groundwater (IOW): New borehole at Eastern Yar3 (1.5Ml/d) (2040)	• Both within 500m of A cross dyke and bowl barrow on the northern spur of Beacon Hill and Large univallate hillfort at Beacon Hill Scheduled Monuments • Both within 500m of Burghclere Beacon and Highclere Park SSSIs • Both within 500m of Highclere Park Registered Park and Garden • Both within 500m of the North Wessex Downs National Landscape • Both within 1000m of the Woodham House Historic Landfill site
	Recycling (HSE): Recharge of Havant Thicket from recycled water from Budds Farm (60Ml/d) (2035)	N/A
	Bulk import (HSE): Havant Thicket Reservoir to Otterbourne WSW (90Ml/d) (2035)	N/A

6.2.2 HRA in-combination effects assessment findings

The HRA concluded that, for virtually all options, there will be no adverse effects alone or in combination that cannot be reliably avoided through scheme design or mitigated with measures that are known to be available, achievable and likely to be effective at the project-level. These options are not of a scale or type that would ensure suggest that adverse effects were are unavoidable irrespective of how the option is delivered.

In summary, no adverse effects on European site integrity are anticipated as a result of the fdWRMP24 options operating in combination; however, there are some minor residual uncertainties in relation to the sites and options identified in Table 6-2 below (partly due to uncertainties in the alone assessments) that can only be resolved with more detailed project-level investigations (although mitigation or avoidance measures will almost certainly be available given the long lead time before any potential in combination effects are realised):

Table 6-2 European Sites and Options identified through the HRA in-combination assessment.

European Sites	Options	Notes
Margate and Long Sands SAC	• Desalination (KTZ): East Thanet	This site is only likely to be exposed to in-combination effects from the operation of the East Thanet desalination options (construction effects will only occur once, in relation to the outfall), which will necessarily operate additively (i.e. the initial 20Ml/d plant will be supplemented a second plant). Based on proxy information from other sites presented in the alone assessment it is considered that these options will not result in adverse effects on this site (also given the low sensitivity of the interest features) although there is some residual uncertainty regarding this conclusion.
Medway Estuary and Marshes SPA / Ramsar	• Desalination (KME): Isle of Sheppey • Recycling (KMW): Medway WTW to lake (14Ml/d) • Recycling (KME): Sittingbourne industrial water reuse (7.5Ml/d)	This site is potentially exposed to operational effects from the Isle of Sheppey desalination schemes, plus Medway Recycling and Sittingbourne Industrial Reuse. Only the zones of environmental change associated with the desalination options will overlap, and so additive effects at one or more locations between the desalination options and the other options will not occur. Adverse effects alone are not expected as a result of the Medway recycling scheme, and so in combination effects associated with this option are not anticipated; this applies to the Sittingbourne scheme also, where any residual effects on the site are expected to be not adverse and local to the Milton Creek only (hence not this SPA/Ramsar). However, the operation of the desalination plant will necessarily operate additively (i.e. the initial 10Ml/d plant will be supplemented a second plant), although construction effects associated with the outfall will only occur once. Based on proxy information from other sites presented in the alone assessment it is considered that these options will not collectively result in adverse effects on this site, and that potential effects can be avoided through the design stage; however, there is some residual uncertainty regarding this conclusion given the absence of detailed design information.
Outer Thames Estuary SPA	• Desalination (KTZ): East Thanet • Desalination (KME): Isle of Sheppey	This site will be affected by the Thanet desalination options (which will inevitably affect the same location within the site through operation, although 'in combination' construction effects will not occur) and potentially by the Isle of Sheppey desalination options (again, cumulatively) depending on the location of the outfall for that option. However, the zones of environmental change associated with e.g. saline plumes are very unlikely to overlap (so spatially coincident additive effects between the two desalination scheme locations would not be expected). The features of the site are likely to have a fairly low sensitivity to the magnitude of environmental change anticipated based on proxy data and evidence from

European Sites	Options	Notes
		schemes elsewhere, and the proportion of the European site potentially subject to environmental changes as a result of the options will be very small (i.e. the vast majority of the site will be entirely unaffected), and so spatially non-coincident in combination effects (e.g. birds being displace from two key foraging areas) would not be expected.
Thames Estuary and Marshes SPA / Ramsar	• Desalination (KME): Isle of Sheppey • Desalination (KMW): Thames Estuary	This site is potentially exposed to operational effects from the Isle of Sheppey desalination schemes (will ultimately operate additively at one location) and the Thames Desalination options (will also operate additively at one location). The environmental changes associated with the two desalination sites are unlikely to coincide geographically. However, the operation of the desalination plants will necessarily operate additively (i.e. the initial 20Ml/d plants will be supplemented additional treatment plants), although construction effects associated with the outfalls will only occur once. Based on proxy information from other sites presented in the alone assessment it is considered that these desalination options will not individually result in adverse effects on this site, and that potential effects can be avoided through the design stage; however, there is some residual uncertainty regarding this conclusion given the absence of detailed design information. Note that this does not take account of potential in combination effects with Beckton.

Currently, alternatives to the desalination options are not available within the modelled BVP; however, there is sufficient time for these uncertainties to be investigated and the option(s) amended or abandoned given the 2040+ delivery periods. On this basis, it would be possible to adopt the plan with the support of a detailed investigation timetable for the resolution of these uncertainties.

6.2.3 WFD cumulative effects assessment findings

In order to understand the WFD compliance of the fdWRMP24 as a whole, a cumulative assessment was undertaken of the options within the preferred plan as part of the WFD assessment. The WFD assessment found that seven individual water bodies have the potential to be affected as a result of cumulative effects from multiple options in the Preferred Plan, as summarised below:

- GB107041012810 (Western Rother): There are five options in the catchment of this water body, three of which have the potential to alter river flows. Use of multiple options together could result in a cumulative impact;
- GB30644398 (Bewl Water): There are two options relating to this water body. How they interact will depend on the relative timings and details of the scheme, but there is potential for cumulative impact;
- GB106040018500 (Bewl): There are two options relating to this water body. There is a risk of non-compliance (low confidence) from one option, but this risk is not expected to increase cumulatively;
- GB107042022580 (Itchen): This waterbody was identified for cumulative assessment due to there being seven options involving construction activities in the catchment. However, the cumulative effect is concluded to be WFD compliant, with some options using the same infrastructure and others not crossing the watercourse;
- GB107101005971 (Eastern Yar (Lower)): There are three options relating to this waterbody. The cumulative effects may reduce the risk of WFD non-compliance compared to the options alone, as they balance each other out from a water balance perspective;
- GB40701G501200 (River Test Chalk): There are four options involving abstraction from this groundwater body. However, due to other constraints that limit abstraction in the Test catchment, non-compliance with the WFD is not anticipated either alone or cumulatively;

- GB40701G503100 (Lower Greensand Arun & Western Streams): There are three options involving abstraction from this groundwater body. Use of multiple options together could result in a cumulative impact.

The main river catchments containing multiple options were also identified (where the water bodies may be in the same or different water bodies in the wider catchment, but could potentially converge at a downstream point). Only those options involving operational activities that may impact the WFD status of the waterbody have been considered. There are 10 main river catchments that could potentially be impacted by multiple options. Based on available information, the assessments conclude that there may be cumulative effects resulting in WFD non-compliance, to a greater extent than for the options individually, for three of those catchments. These are the Arun, Ouse and Medway catchments. However, the nature and scale of those potential cumulative impacts will require further assessment.

While no change to the categorisation of level of confidence of WFD compliance/ non-compliance was identified as a result of the cumulative assessment, compared to the individual option assessments, further investigation is required for most options (both individually and cumulatively) in order to better understand their impacts on WFD status. It is likely that there is the potential for some impacts to be 'more' non-compliant with WFD, when considered cumulatively at the plan level, compared to the options individually.

6.3 Cumulative Effects of the Revised Preferred Programme

The assessment of individual options (Appendix K), interactions between options and the receptors identified in **Error! Reference source not found.** as well as the findings of the HRA and WFD assessment have i nformed the assessment of cumulative intra-plan effects for the fdWRMP24. Table 6-3 sets out the likely cumulative effects (post mitigation) associated with the preferred programme of options as a whole by SEA Topic and Objective.

Table 6-3 Cumulative effects assessment of the preferred programme of options.

SEA Topic	SEA objective	Cumulative Score Construction (Post mitigation)	Cumulative Score Operation (Post mitigation)	Commentary
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	---/?	+/---	The construction phase will lead to some effects due to loss of/disturbance of habitats and species. It is likely that the residual significance of these effects can be reduced through appropriate phasing of options and through mitigation measures at the project level when more detailed information is available. However, the HRA could not rule out adverse effects with certainty for the construction phase of the East Thanet desalination plant (20Ml/d) option arising from the proposed outfall being located within the Outer Thames Estuary SPA and potentially within the Margate and Long Sands SAC. The proposed plant and pipeline would be located within the Thanet Coast SSSI, run through the SSSI impact zones associated with the Sandwich Bay to Hacklinge Marshes SSSI, and has the potential to impact upon the Thanet Coast MCZ. There are some uncertainties that can only be resolved with detailed design. Cumulatively, significant negative effects with uncertainty are identified for the construction phase. In the operation phase, the HRA could not rule out with certainty adverse effects for a number of options within the preferred programme at the plan level. This is in relation to the hypersaline discharge related to the operation of the desalination schemes: • Isle of Sheppey regarding impacts on the Medway Estuary and Marshes SPA and Ramsar and Thames Estuary and Marshes SPA and Ramsar; • River Thames desalination regarding impacts on the Thames Estuary and Marshes SPA and Ramsar; • East Thanet desalination scheme with regards to Outer Thames Estuary SPA and Margate and Long Sands SAC. There is a level of uncertainty with regards to the findings of the HRA at this stage with regards to some of the options. Additionally, it is noted that some drought options require mitigation and monitoring measures to be in place to ensure no adverse effects. Therefore, overall, the cumulative effect of the preferred programme of options is assessed as a significant negative in the operational phase. Currently, alternatives to the desalination options are not available within the modelled BVP; however, there is sufficient time for these uncertainties to be investigated and the option(s) amended

SEA Topic	SEA objective	Cumulative Score Construction (Post mitigation)	Cumulative Score Operation (Post mitigation)	Commentary
				or abandoned given the 2040+ delivery periods. On this basis, it would be possible to adopt the plan with the support of a detailed investigation timetable for the resolution of these uncertainties. There would be a temporary and permanent loss of habitat during the construction of the preferred programme of supply side options. However, the fdWRMP24 makes a commitment to achieving biodiversity net gain (BNG) and provision of ecosystem services associated with habitat creation and enhancement such as new woodland sequestrating carbon. Southern Water is committed to achieve the required 10% BNG for each relevant final draft WRMP24 option when implemented as a project level scheme, and exceed 10% BNG for those schemes that offer sufficient biodiversity uplift potential. Southern Water will systematically assess and manage the BNG of WRMP24 schemes at the project level using the latest Biodiversity Metric tool (currently Statutory Biodiversity Metric). These developments will be guided by best practice, in particular the BNG Good Practice Principles for Development . This approach to BNG is in line with Southern Water's wider company BNG Policy . Biodiversity is already a key aspect of Southern Water's Environmental Management System (EMS) and will be supported by internal BNG guidance. In addition, Southern Water is aiming to exceed the 10% BNG goal at the programme level for implemented options that require BNG. Progress towards exceeding the 10% BNG goal at the programme level will be periodically monitored through aggregation of scheme-level BNG performance. This process will highlight to what extent the programme is on track towards achieving this goal. Additional BNG measures would be considered if required to achieve programme-level BNG above 10% (for schemes that require BNG). A minor positive score is therefore also assessed in the operational phase reflecting the scale of loss during the construction phase (that would then see a net gain in the operational phase). There is potential for additional benefit to be gained through consideration of opportunities for BNG across Southern Water's wider landholdings and in consequence, some uncertainties remain at this stage. The operational stage also presents an opportunity to improve existing habitats through post-construction remediation and replacement of low value habitats with higher value habitats. Therefore, cumulative minor positive effects are also assessed. This has the potential to be a moderate positive depending on how it is implemented.

SEA Topic	SEA objective	Cumulative Score Construction (Post mitigation)	Cumulative Score Operation (Post mitigation)	Commentary
Soil	Protect and enhance the functionality, quantity and quality of soils	--	-	Construction and operation of water resources infrastructure could affect soils due to land take associated with new development. This may result in clearance of vegetation and loss of soil levels leading to the loss of soil function and processes. Mitigation measures are likely to reduce this loss through ground reinstatement. However, some permanent loss of soils, including the best and most versatile agricultural land is likely. Theclose proximity of some options could result in cumulative effects during the construction phase. Some of the preferred programme options would take place on existing operational land which would not detract from achievement of the objective. However, overall a likely moderate negative score is assessed for the preferred programme of options in relation to the construction phase. The residual effects in the operation phase are expected to be minor, reflecting that the majority of schemes (pipelines) will allow for full reinstatement.
Water	Increase resilience and reduce flood risk	-	-	A number of preferred supply side options are located partially within Flood Zones 2 or 3, predominately related to the location of proposed pipelines. Measures to reduce flood risk will therefore need to be implemented in the construction phase. However, in the operational phase, once pipelines are in place, there is no residual risk, and the relevant options are would not have the potential to exacerbate flood risk in the operational phase. However, the Thames Estuary desalination option includes permanent above ground infrastructure located within Flood Zone 2 and 3. Mitigation measures would be required to minimise the risks of flooding to the new assets. For both construction and operation, cumulative minor negative effects are assessed.
	Protect and enhance the quality of the water environment and water resources	-	---	A number of options would involve construction work across waterbodies or are close to waterbodies. This will require mitigation measures to minimise or avoid impacts on water environment. Cumulative minor negative effects are assessed for the construction phase. The WFD assessment found that the supply options could have effects on water quality affecting the ability of some waterbodies to meet WFD objectives. These issues could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature). Many of the options with potential non-compliance were assessed with low confidence. However, for four options, the WFD assessment concluded the potential for non-compliance with the WFD (with medium confidence).Three of these options involve effluent re-use schemes where the effluent would be

SEA Topic	SEA objective	Cumulative Score Construction (Post mitigation)	Cumulative Score Operation (Post mitigation)	Commentary
				discharged to a lake. The other involves a groundwater abstraction. There is limited detail available for these options, which are subject to further investigation, it is possible that different conclusions could be drawn with more evidence. If confirmed for the final WRMP24, the findings of the WFD assessment would therefore require Southern Water to consider alternative options, and if also non-compliant, the case for the potential for the application of Regulation 19 to individual options, in line with guidance issued by the Environment Agency (2023[60]). Additionally, three Drought Plan options included within the preferred programme were assessed as having significant negative effects individually, given the findings of the Drought Plan 2022 WFD and SEA assessments (2025), due to their potential to result in a deterioration in status. Given the findings of the WFD, overall significant negative cumulative effects are assessed for the programme as a whole in the operation phase.
	Deliver reliable and resilient water supplies	0	+++	The preferred programme of options would deliver increased capacity across the Southern Water area which will help to ensure a reliable and resilient water supply. Included within the programme are a number of interzonal bi-directional transfers which will help to support supply within areas of deficit. Overall, in the operation phase the preferred programme of options would be expected to deliver significant positive effects against this SEA objective. Cumulatively neutral effects are assessed in the construction phase.
Air	Reduce and minimise air emissions	--	-	Construction of the preferred programme of options will generate emissions to air which could affect local air quality. The principal source of emissions would be pollutants associated with vehicle movements. Vehicle emissions could affect sensitive receptors along transport corridors and effects are likely to be more pronounced where development is located in close proximity to AQMAs. Few of the preferred options are within AQMAs, and where this occurs this only relates to pipeline elements (with the exception of the Thames Estuary desalination plant location within the Northfleet Industrial Area AQMA) although more options are close to AQMAs, through which, some construction traffic may flow. However, the effects would be temporary and best practice mitigation measures would be expected to minimise (or in some cases avoid) the potential for negative effects for options alone. Where this includes options later in the plan (post 2035), it is possible that low emission/zero emission vehicles would be used (reflecting government policy on the ban of the sale of new petrol

[60] Environment Agency (2023) *WFD Regulation 19 exemptions for water company water resources permissions* (LIT 65716) Published 27/03/2023

SEA Topic	SEA objective	Cumulative Score Construction (Post mitigation)	Cumulative Score Operation (Post mitigation)	Commentary
				and diesel cars and vans from 2035 and diesel HGVs by 2040). There is the potential for cumulative effects (for example between options in the Sussex North Zone WRZ) in the construction phase due to the proximity of some options if construction takes place simultaneously. However, for the plan as a whole cumulative effects are not significant. There remains some uncertainty as the location of demand management and leakage reduction interventions are currently not known but any interventions requiring construction could be timed to avoid simultaneous construction. Overall, it is concluded that there will likely be moderate negative air quality effects during the construction phase. In the operational phase these effects linked to vehicle movements are expected to be lower than during construction with residual minor effects likely remain for the plan as a whole.
Climatic Factors	Reduce embodied and operational carbon emissions	---	+/---	The construction of the preferred programme of supply side options will require materials with embodied carbon. Construction will also generate a substantial volume of vehicle movements which, together with the operation of plant and machinery, will additionally contribute to carbon emissions. The preferred demand management and leakage options would also (when taken together) require materials with significant cumulative embodied carbon. The embodied carbon in the construction phase is likely to be cumulatively significant. In the operational phase the preferred supply options would incur ongoing carbon emissions associated with the energy used e.g. pumping stations, WTW works, desalination plants. Cumulatively, this is likely to be significant. However, the demand management options will see a reduction in carbon linked to reduced demand for water, whilst drought options would reduce use which would likely see reduced energy consumption. Some residual cumulative minor positive effects are therefore also assessed in the operation phase. Overall, a mix of significant negative and minor positive effects are assessed in the operational phase.
	Reduce vulnerability to climate change risks and hazards	0	++/--	The resilience is unlikely to be affected in the construction phase and therefore neutral effects are assessed. Cumulatively the preferred programme of supply options would increase the capacity of water supply within the Southern Water area. In addition, the demand management and leakage reduction measures would make a significant contribution towards securing a continual supply of clean

SEA Topic	SEA objective	Cumulative Score Construction (Post mitigation)	Cumulative Score Operation (Post mitigation)	Commentary
				drinking water and increase resilience of this supply, thereby increasing resilience and adaptability to the effects of climate change. However, there may be some cumulative negative effects in relation to the application of the drought measures (linked to increased abstraction). A mix of moderate positive and minor negative effects are therefore assessed for the operational phase.
Landscape	Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	---	-	The preferred programme of supply options includes a number of options that either partially pass through or are wholly within the following designated landscapes in the Southern Water area: South Downs National Park, High Weald National Landscape, Kent Downs National Landscape, North Wessex Downs National Landscape. The majority of these schemes are related to pipeline construction. Mitigation measures are considered likely to reduce the construction effects for individual options. Whilst individually, the effects of options have not been identified as significant, overall, given the number of schemes and their setting, there is likely to be a cumulative significant negative effect on landscape in the construction phase. The significance of these effects could be reduced by appropriate phasing and the effects will be temporary. The residual effects in the operation are considered to be much less than during the construction. The majority of schemes relate to piping infrastructure with little above ground infrastructure either within or in proximity to designated landscapes. Cumulative minor negative effects are therefore assessed for the operational phase.
Historic Environment	Conserve, protect and enhance the historic environment, including archaeological remains	--	-	The preferred programme includes several options that are located within designated assets or in close proximity. No significant effects were anticipated for the preferred programme of options individually following the application of mitigation measures, such as trenchless techniques and pipeline routing alignment. The development of water resources infrastructure may also result in indirect (e.g. impacts on setting) adverse effects on the significance of heritage assets including scheduled monuments and listed buildings where they are in close proximity to works. However, any effects would be temporary (i.e. for the duration of construction) and taking into account the scale of construction activity at each site, and given mitigation measures that can be employed, effects are not predicted to be significant individually or cumulatively. Overall, some residual minor operation effects may be experienced where above ground infrastructure is in the setting of assets. Additionally, the implementation of drought options may have temporary impacts on the grounds of Registered Parks or Gardens or Listed Buildings (thereby

SEA Topic	SEA objective	Cumulative Score Construction (Post mitigation)	Cumulative Score Operation (Post mitigation)	Commentary
				affecting setting) through the restrictions placed on water use. These effects are temporary and uncertain to some extent.
Population and Human Health	Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	--	+++/-	The construction of water resources infrastructure can adversely affect health and wellbeing through the generation of traffic, noise, vibration, emission to air. Communities in areas where development is required will inevitably experience some disturbance, although best practice construction measures can often reduce such impacts. A number of options are also close to or cross public or sporting facilities. Therefore, it is recognised that that preferred programme of options will cumulatively have temporary effects in relation to access to public parks, playing fields, sport and other recreational facilities, and may lead to temporary diversions to Public Rights of Way (PRoW) (although mitigation measures and careful routing can help to minimise or avoid). These effects are temporary but can be of scale that is significant to specific locational receptors. However, overall, the impact is not considered to be cumulatively significant, which reflects that the impacts are temporary and mitigation measures can reduce or avoid impacts. In the operational phase the positive effects on health primarily relate to the provision of clean drinking water alongside demand management and leakage reduction of across the Southern Water area, which taken together are considered significant. However, some drought measures (such as the non-essential use ban and reduction to provision to commercial customers, which may impact some businesses) will likely have negative impacts in the operational phase. Therefore, cumulatively, a mix of significant positive and minor negative effects are assessed.
	Maintain and enhance tourism and recreation	--	-	As noted above, the location of some options will mean that there are inevitable impacts on recreational facilities either indirectly (in terms of noise or disturbance) or directly, thereby requiring mitigation such as diversions of PRoW. There may also be impacts on visitor experience linked to the construction works although this is unlikely to be cumulatively significant, with effects experienced at a more localised level. Therefore, in the construction phase negative effects are expected on tourism and recreation. Cumulatively, given the temporary nature and mitigation measures employed, this is likely to be moderate. In the operation phase some impacts linked to drought options including, for example, the restriction on filling of swimming pools or reduction in water supply to tourism and recreation businesses may

SEA Topic	SEA objective	Cumulative Score Construction (Post mitigation)	Cumulative Score Operation (Post mitigation)	Commentary
				lead to effects in the operation phase, although largely for the plan overall this is expected to be very minor. Cumulatively, minor negative effects are assessed for the plan as a whole.
Material Assets	Minimise resource use and waste production	---	--	Given the cumulative concrete, steel and plastics that will likely be required to construct the preferred programme of supply options there is likely to be a significant amount of material and resources required and which will also be associated with waste generated (although there is some potential for re-use of materials and sustainable design measures). The preferred programme of demand management options and leakage measures would also require material resources in some cases (for example in the production of meters and materials for pipeline/mains renewal). Cumulative significant negative effects have therefore been assessed for this objective. In the operation phase, although there may be some minor positive effects linked to reduced water use as a result of, for example, temporary use bans, this is not likely to lead to cumulative positive effect. However, there will be ongoing production of waste linked to chemical treatment of water and generation of brine from desalination as a result of the plan. Cumulatively, this is likely to be moderately negative.
	Avoid negative effects on built assets and infrastructure	--	0	A number of options intersect with major roads including A roads, railway lines, and national cycle routes, whilst others are located within built up areas. Cumulatively, there is therefore likely to be some disruption to built assets and infrastructure during the construction phase, including the need for road closures and diversions. Cumulatively, for the preferred programme as a whole, this is considered likely to be moderate negative. In the operation phase, neutral cumulative effects are assessed given infrastructure will be in situ.

6.4 Cumulative Effects with Existing Relevant Plans, Programme and Projects

6.4.1 Introduction

The SEA Regulations require that the cumulative effects of the fdWRMP24 are assessed. This includes the cumulative effects of the individual preferred options that comprise the preferred programme and the effects of the fdWRMP24 in combination with other plans and programmes.

The cumulative effects of the individual options that comprise the preferred programme of fdWRMP24 preferred options are presented in **Section 0**, in addition to which the cumulative effects of the fdWRMP24 in combination with other plans and programmes, are relevant, including:

- the fdWRMP24 with the Water Resources South East (WRSE) Regional Plan;
- the fdWRMP24 with other water company final WRMP24s;
- the fdWRMP24 with Southern Water's Drought Plan;
- the fdWRMP24 with other plans e.g., Environment Agency National Drought Plan, River Basin Management Plans, Shoreline Management Plans;
- the fdWRMP24 with other Nationally Significant Infrastructure Projects (NSIPs).

There are inherent uncertainties associated with assessing the cumulative effects of the fdWRMP24, relating to factors such as: future changes to baseline environmental conditions; future population and economic growth; the deliverability of proposed NSIPs and potential future projects, including those associated with other water companies in the WRSE area. As such, it will be necessary to keep under review these factors as the preferred programme is implemented (e.g. in any subsequent scheme level Environmental Impact Assessments (EIA) and HRAs, where required) to ensure that the latest and most up to date information is taken into account.

6.4.2 Regional and Water Resource Management Plans

Water Resources South East Regional Plan

WRSE Regional Plan aims to be a resilient plan that considers the whole of south east England as a single region, unconstrained by water company boundaries, to determine the best value options to meet the water requirements of the domestic and non-domestic consumers in the region. The Regional Plan is to be finalised in 2025. The WRMPs to be published by individual water companies are expected to align with the regional plan consistent with national guidance[61]. To support the alignment, WRSE commissioned a new integrated environmental assessment process to provide a consistent framework for environmental assessments of both the WRSE Regional Plan and the constituent WRMPs. SEA, HRA and WFD assessments[62] have been completed to accompany the Revised Draft Regional Plan and are expected for the Final Regional Plan. These assessments provide the cumulative effects assessment of the revised draft WRMPs in conjunction with the Revised Draft Regional Plan. The WRSE Revised Draft Regional Plan SEA Environmental Report identified the following cumulative effects for the Regional BVP under Situation 4:

- **Biodiversity, flora and fauna** - There is potential for residual significant negative cumulative effects on a number of statutory and non-statutory designated sites arising from construction and

[61] UK Government (2023) *Water Resource Planning Guideline* [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline.

[62] WRSE (2023) WRSE Revised Draft Plan - Strategic Environmental Assessment Environmental Report, Habitats Regulations Assessment Report and Water Framework Directive Assessment Report

operational activities. HRA in-combination assessment has been undertaken for the Revised Draft Regional BVP to identify where two or more options included in different WRMPs have the potential to generate in-combination effects on European sites. The assessment found the potential for in-combination adverse effects on European Sites as a result of interactions during the construction and operation of a number of options therefore major negative effects were identified. Potentially affected sites include the Thanet Coast and Sandwich Bay SPA/Ramsar, Thames Estuary and Marshes SPA/Ramsar, Outer Thames Estuary SPA, Blean Complex SAC, Stodmarsh SAC/SPA/Ramsar and Oxford Meadows SAC. Residual positive cumulative effects have been identified during operation due to more water being kept in the environment as a result of the 'High' Environmental Destination (a decision to deliver long-term sustainability and environmental resilience) and demand management options.

- **Soil** - There is potential for cumulative disturbance effects on agricultural land, including BMV Agricultural Land, during the construction phase but also permanent losses where options have above ground infrastructure. Residual minor cumulative effects are identified for construction and residual neutral cumulative effects during operation. The catchment management schemes may lead to positive cumulative effects as they include options which aim to improve water quality at landscape scale with a focus on soil health/management.
- **Water** - There are multiple possible options within the same catchment which may have cumulative effects on the same water body during construction and operation. There are options within the Regional BVP that have similar construction programmes and cross the same and/or multiple main rivers, chalk rivers and waterbodies within close proximity to one another. An in-combination WFD assessment has been undertaken for the options selected within the Regional BVP that fall within the boundaries between the water companies. In summary, the WFD in-combination assessment identified that there are two waterbodies that are impacted by more than one of the Regional BVP Situation 4 options and where there is a risk of WFD deterioration and therefore the potential residual cumulative significant negative effects. These are GB106040018160 Lower Eden and GB40601G602200 Epsom North Downs Chalk. The combined benefit of the Regional BVP options located within the water company boundaries are likely to result in resilient supplies which meet demand therefore major positive cumulative effects are identified. The catchment management schemes also have the potential for cumulative effects as they include activities to improve water quality and reduce pollutants, increase resilience to low flows and increase the storage of water within the environment, facilitating resilience during drought.
- **Air** - There is likely to be localised cumulative effects on air quality from the construction phase for options which are located within close proximity and whose phasing overlaps. The effects may require further investigation if they are located within AQMAs. There is also likely to be localised cumulative effects on air quality during the operational phase of the options from staff and maintenance transport and any emissions from treatment works.
- **Climatic Factors** - All the options will generate carbon emissions from construction associated with embodied carbon emission from construction materials, construction related transport and on-site activities. Most options involve pumping stations or other electricity uses and will therefore generate carbon emissions during operation. Desalination plants involve large amount of energy during operation. Adverse cumulative effects are therefore identified during construction and operation. The Regional BVP includes a number of options which involve abstraction from surface and groundwater sources and therefore have the potential to result in negative cumulative effects on the resilience of the natural environment to climate change. The demand management options along with the catchment management schemes will help to retain more water within the environment compared to the existing situation. This improves the resilience of the natural system and thus increase or maintain resilience to climate change with a positive cumulative effect.
- **Landscape** - Cumulative negative effects on the landscape are predicted during the construction phase where options are located, within close proximity to one another, and are being constructed at similar times. The catchment management schemes may lead to positive cumulative effects for the

landscape across the WRSE region as they contain options which improve the overall health of the catchment such as through wetland creation, river restoration and agricultural measures.

- **Historic Environment** - Potential for adverse cumulative effects identified on the significance and/or setting of built designated heritage assets during construction where options are in close proximity. The impacts would primarily be temporary during construction, particularly where options would comprise permanent below ground infrastructure, and would be mitigated by construction best practice. Neutral effects are predicted during operation.
- **Population and Human Health** - The local community, tourism and recreation all have the potential to be affected by options, particularly where due to proximity and phasing during construction as a result of temporary disturbance, noise, vibration and traffic. It is expected that best practice measures implemented during the construction phase would mitigate this risk. The Regional BVP, in operation and as a whole, provides sufficient water to maintain the health and wellbeing of communities, both the current population and predicted new residential and commercial development. Economic development will be facilitated through the construction and operation of options. Job creation and supply chain benefits are likely to accrue through the delivery of a number of the supply-side options, including large infrastructure projects.
- **Material Assets** - The cumulative effects of the new infrastructure proposed will require significant quantities of materials and generate waste, including excavated materials, although will also present substantial material reuse opportunities. Options within the catchment management schemes may have cumulative positive effects as they contain natural flood management options and pesticide reduction which will help to reduce the use of resources. There is the potential for minor residual negative cumulative effects as a result disruption to transport infrastructure during the construction of options.

At this stage given the strategic nature of the Regional Plan as well as the long planning horizon it is likely that further studies and mitigation could help to reduce the significance of any potential negative cumulative effects. This includes the identification and development of suitable alternative solutions that would avoid or substantially reduce the significance of any residual negative effects. However, these options are not available at this time and would need to be developed collaboratively between water companies through the next iteration of the Regional Plan.

Other Water Company Water Resource Management Plans (WRMPs)

Southern Water and its neighbouring water companies have worked collaboratively on the WRSE Regional Plan and its assessment. As part of this process, option information, including GIS has been shared to facilitate consideration of in-combination effects (for the HRA) and cumulative effects (WFD). Separately the revised draft WRSE Regional Plan SEA[63], HRA[64] and WFD[65] have also considered the potential for in-combination and cumulative effects and where relevant have also been considered.

The HRA of Southern Water's fdWRMP24 found the following in relation to the in combination effects between different water company options:

- Thames Water: No European sites will be exposed to operation x operation in combination effects between TW and SWS options (minor construction x construction pathways for some sites are conceivable, but can all self evidently be avoided with normal measures). Conclusion: no adverse effects in combination.

[63] WRSE Revised Draft Regional Plan. Strategic Environmental Assessment Environmental Report. 18th September 2023.

[64] WRSE Revised Draft Regional Plan. Strategic Environmental Assessment Environmental Report. Appendix H- HRA Report. 15th September 2023.

[65] WRSE Revised Draft Regional Plan. Strategic Environmental Assessment Environmental Report. Appendix I- WFD Report. 12th September 2023.

- Affinity Water: No European sites will be exposed to operation x operation in combination effects between AFW and SWS options (minor construction x construction pathways for some sites are conceivable, but can all self-evidently be avoided with normal measures). Conclusion: no adverse effects in combination.
- Sutton and East Surrey Water: No European sites will be exposed to operation x operation in combination effects between SES and SWS options (all SES options screened out; all effects on relevant European sites from SWS options construction-related and hence can all self-evidently be avoided with normal measures). Conclusion: no adverse effects in combination.
- Portsmouth Water: The European sites associated with Langstone Harbour (i.e. Chichester and Langstone Harbours SPA / Ramsar, Solent and Isle of Wight Lagoons SAC, Solent Maritime SAC) are close to the Budds Farm Recycling option (SWS) and the Increased Treatment Capacity at Farlington options (PW), although the PW HRA concludes no LSE for the Farlington schemes, and the available evidence for the Budds Farm recycling scheme suggests that the zone of environmental change for the operational effects will not overlap with these sites (since the discharge is via the Eastney LSO to the Solent). Conclusion: no adverse effects in combination.
- Southeast Water: The Reculver Desalination option (SEW) is located close to the proposed East Thanet Desalination option (SWS). Both will require outfalls that (a) will need to cross the Thanet Coast SAC and Thanet Coast and Sandwich Bay SPA / Ramsar (construction impacts likely avoidable with engineering solutions); (b) will require permanent outfall structures in or near Margate and Long Sands SAC (impacts depend on the nature of the installation, although features will have low sensitivity); (c) require permanent outfall structures in the Outer Thames Estuary SPA (impacts depend on the nature of the installation, although features will have low sensitivity); and (d) operational discharges within or close to the Outer Thames Estuary SPA and the Margate and Long Sands SAC. It is likely that adverse effects can be avoided through appropriate design of these facilities, and evidence from other desalination plants suggests that the environmental changes will be relatively small magnitude (with the interest features having low sensitivity to these changes), however there remains uncertainty over in combination effects due to the proximity of the options and the likelihood of spatially coincident environmental changes that cannot be quantified at the plan-level. Conclusion: residual uncertainties over in combination effects on Margate and Long Sands SAC and Outer Thames Estuary SPA.
- Wessex Water: The only European site potentially exposed to environmental changes associated with options in the SWS WRMP24 and the Wessex Water WRMP24 is the Solent and Dorset Coast SPA; however, the Wessex Water options involve minor construction near up-catchment tributaries and will have 'no effect' on this site due to their distance from the site boundary (so no possibility of 'in combination' effects).
- Bournemouth Water: Information on the options in the Final WRMP24 is not available; however, based on the dWRMP24 HRA there is only one option that has the potential for operation x operation in combination effects with SWS options (option BNW1, a groundwater abstraction that may affect Solent and Southampton Water SPA / Ramsar around Lymington SSSI); this is discussed in **Error! R eference source not found.**. Conclusion: no adverse effects in combination.

The revised draft WRSE Regional Plan WFD assessment has concluded that for the Southern Water Best Value Plan (BVP Sit 4), whilst there were a number of catchments where Southern Water and at least one other water company have an option, no additional cumulative effects were identified.

Southern Water has also reviewed the WFD compliance assessment of its own plan against the option information available from other plans. This has been undertaken at both the water body and operational catchment level, to supplement and complement the assessment undertaken by WRSE. The comparison exercise found:

- Portsmouth Water (PW): there are no waterbodies that could be impacted by both PW and Southern Water.

- South East Water (SEW): There are options in a number of operational catchments that are identified in both SEW and Southern Water's WRMPs, including in the Thames, Medway, Rother and Brede catchments. However, no catchments have been identified where both water companies have operational impacts. Therefore, it may be assumed that there will be no cumulative impacts on WFD compliance.
- Sutton and East Surrey (SES): There is one option in the Medway operational catchment where a risk to WFD compliance has been identified, and could potentially have an in-combination effect with some of Southern Water options in the Medway catchment. There are existing flow constraints on the Medway at Teston that may be used to manage this effect. However, further detailed assessment is required.
- Affinity Water (AfW): There are options in a number of operational catchments that are identified in both AfW and Southern Water's WRMPs, including in the Thames and Stour catchment. However, no catchments have been identified where both water companies have operational impacts. Therefore, it may be assumed that there will be no cumulative impacts on WFD compliance.
- Thames Water (TWUL): Four WFD water bodies (including one transitional, two groundwater and one river) have been identified where there are options belonging to both TWUL and Southern Water that could involve operational impacts. Note that where there may be a departure of conclusion with the WRSE and TWUL findings, this may in part reflect superseded data used in comparable assessments. With regard to the in-combination effects on the North Kent Medway Chalk and Ebsfleet water bodies, further investigation into the impact of abstraction is required. For the Berkshire Downs Chalk waterbody, the potential impact of abstraction (within licence limit) and potential for impacts on water balance and dependent surface water body states requires further consideration. Whilst further water quality modelling of the discharge of hypersaline water into the Thames Middle waterbody is required to understand whether desalination options in the TWUL WRMP24 and Southern Water's Thames Estuary desalination options will produce a cumulative impact.

In summary, therefore, there are potential in-combination effects of Southern Water's WRMP with Sutton and East Surrey and Thames Water's WRMPs, which should be given further consideration.

Southern Water Drought Plan 2022

The Drought Plan is a statutory plan and will set out sets out how Southern Water will respond to drought conditions in its area, ensuring the continued supply of water to customers during periods of low rainfall when water resources become depleted, whilst minimising any negative effects of the actions taken. Southern Water published its draft Drought Plan for consultation in June 2021, its Statement of Response[66] in September 2021 and an addendum[67] in April 2022.

The scope for in-combination effects of the WMRP24 with the drought management measures included in the Drought Plan 2022 is limited as in most cases the drought management measures have been integrated into the fdWRMP24. There is the potential for cumulative beneficial effects between the Test and Itchen catchment management options with the Test Surface Water Drought Permit/Order and the Lower Itchen sources Drought Order by helping improve the environmental resilience of these rivers to abstraction at times of low river flows.

This assessment aligns with the Southern Water 2022 drought plan suite of environmental assessments. We are aware that Southern Water continues to work with the EA/NE to gain agreement on HRAs such as those

[66] Southern Water (2021) *Southern Water's Draft Drought Plan 2021 Statement of Response* 20 September 2021. Available on line: https://www.southernwater.co.uk/media/5304/drought-plan-22-statement-of-response-final-20-sept-2021.pdf

[67] Southern Water (2022) *Southern Water's Draft Drought Plan 2021 Addendum to Statement of Response* 14 April 2022. Available on line: https://www.southernwater.co.uk/media/6655/sw-drought-plan-sor-addendum-april-2022.pdf

for the Test. Southern Water will set out these updates, once complete, when it finalises its drought plan. Any further updates to drought orders/permits after that drought plan is finalised will be shared with EA/NE when available and will be reported on as part of the WRMP annual review process.

6.4.3 Other plans and projects

Environment Agency National Drought Plan

Assessment of the potential for cumulative impacts of WRMP24 options with drought options listed in the Environment Agency national Drought Plan[68] has been undertaken. The information used to carry out these assessments is considered to be the most up to date information available at the time of writing, but the assessments should be reviewed at the time of drought option implementation to ensure that no changes to the Environment Agency Drought Plan have been made in the intervening period, and that the assessment, therefore, remains valid.

Part of the Environment Agency's role is to reduce the impact of drought on the natural environment by taking specific actions. They can apply for environmental Drought Orders if the environment is suffering serious damage because of abstraction during a drought. The plan confirms that the Environment Agency would work with stakeholders, including water companies, to identify where and when it would be necessary to take actions to protect the environment and its potential effects on any essential public supplies or infrastructure. The Environment Agency can restrict spray irrigation during periods of drought which would have a cumulative beneficial effect alongside Southern Water's demand management measures.

River Basin Management Plans (RBMP) (Thames River Basin District and South East River Basin District Plans)

Assessment of the potential for cumulative effects with these River Basin Management Plans (RBMPs) has been undertaken. The information used to carry out these assessments is considered to be the most up to date information available at the time of writing, but the assessments should be reviewed at the time of drought option implementation to ensure that no changes to the River Basin Management Plans have been made in the intervening period, and that the assessment, therefore, remains valid.

The Thames and South East RBMPs describes the planned steps to implement the measures required to achieve the environmental objectives of the Water Framework Directive (WFD). They provide the framework for protecting and enhancing the water environment. Whilst it is noted that the EA screened out the requirement for the most recent RBMP updates, the SEAs[69,70] of the 2015 RBMPs determined that the plans was likely to have significant positive effects on the environment, particularly in respect of biodiversity, water, population and human health and that any local negative effects would expect to be mitigated during implementation. Therefore, there will be **no cumulative impacts** between the Thames or South East RBMPs and the WRMP24.

Cumulative effects with Shoreline Management Plans

Shoreline Management Plans provide a policy context for shoreline / coastal zone management and development. The following Shoreline Management Plans are available within the public domain and were considered for in-combination impacts:

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68 Environment Agency (2017) *Drought response: our framework for England*. June 2017.

69 Environment Agency (2016) *The River basin management plan for the Thames River Basin District Strategic Environmental Assessment: Statement of Particulars Updated December 2015*. https://www.gov.uk/government/collections/river-basin-management-plans-2015

70 Environment Agency (2016) *The River basin management plan for the South East River Basin District Strategic Environmental Assessment: Statement of Particulars Updated December 2015*. https://www.gov.uk/government/collections/river-basin-management-plans-2015

- SMP 9 The Medway Estuary and Swale;
- SMP10 Isle of Grain to South Foreland;
- SMP 11 Beachy Head to South Foreland;
- SMP 12 Beachy Head to Selsey Bill (South Downs);
- SMP 13 Hurst Spit to Selsey Bill (North Solent);
- SMP 14 Isle of Wight;
- SMP 15 Durlston Head to Hurst Spit (Poole & Christchurch Bays).

The assessments for any potential in-combination impacts between these plans and the measures contained Southern Water's WRMP24 were considered with regards to spatial proximity and/or hydrological and/or hydrographical connectivity. No in-combination likely significant effects were identified in respect of the policies set out in the plans. Measures put forward in the Isle of Wight Shoreline Management Plan included the proposed creation of a 30.9ha compensatory habitat of coastal grazing marsh for the Solent and Southampton Water Ramsar site. Such a measure could be considered to have a minor beneficial in-combination effect. The potential for in-combination effects would need to be reviewed again for an application-specific HRA against the latest version of the relevant Shoreline Management Plan if any options with the potential to affect the coastal zone were needed in a future drought event, in dialogue with the Environment Agency, local planning authority and/or other relevant statutory bodies and stakeholders.

Cumulative effects with identified relevant strategic level projects

The Planning Act 2008 introduced a procedure to streamline the decision-making process for Nationally Significant Infrastructure Projects (NSIPs). Under the Act, a developer wishing to construct a NSIP must first apply to the Secretary of State for development consent. National Policy Statements (NPSs) establish the need for specific types of infrastructure and provide planning guidance for promoters of NSIPs, and the basis for the examination by the Examining Authority and decisions by the Secretary of State on development consent order applications. A number of NPSs have been published which set out the definition, and in some cases the location, of NSIPs. The current status of NPSs is set out in

Table 6-4.

Table 6-4 Current status of national policy statements.

National Policy Statement (NPS)	Status	Are potential locations of NSIPs included in the NPS?
Overarching Energy EN-1	Designated January 2024	No
Natural gas electricity generating infrastructure EN-2	Designated January 2024	No
Renewable Energy Infrastructure EN-3	Designated January 2024	No
Natural Gas Supply Infrastructure and Gas and Oil Pipelines EN-4	Designated January 2024	No
Electricity Networks Infrastructure EN-5	Designated January 2024	No
Nuclear Power Generation EN-6	Designated July 2011	Yes
Ports	Designated January 2012	No
Waste Water Infrastructure	Designated March 2012	Yes
Hazardous Waste Infrastructure	Designated June 2013	No
National Networks	Designated May 2024	No
Airports	Designated June 2018	Yes
Water Resources Infrastructure	Designated September 2023	No
Geological Disposal Infrastructure	Designated October 2019	No

The fdWRMP24 is not expected to have any adverse cumulative effects in-combination with the NPSs listed above. This is because the NPSs are either not site specific or because specific NSIP proposals contained in the NPS are unlikely to affect, or be affected by, the measures that comprise the fdWRMP24 e.g. sites for new nuclear power stations, the two NSIPs set out in the Waste Water Treatment NPS and the proposals to increase runway capacity in the Airports NPS. The Water Resources Infrastructure NPS sets out the need for NSIPs related to water resources, and the Government's policies to deliver them. Whilst this NPS is not site specific, implementation of the fdWRMP24 is likely to be compatible with those objectives of the NPS for improving water supply resilience.

Qualifying NSIPs that have received a decision by the Secretary of State to grant a Development Consent Order, in accordance with the relevant NPS and Planning Act 2008 requirements are outlined in

Table 6-5. The Planning Inspectorate's National Planning Infrastructure database[71] identifies a further five projects at pre-application stage, one at pre-examination stage and two at examination stage, and four awaiting decision; however, decisions and subsequent project implementation on these additional projects is less certain.

[71] https://infrastructure.planninginspectorate.gov.uk/projects/south-east/

Table 6-5 Consented major projects in South East England.

Project	Developer	Decision
M3 Junction 9 Improvement	National Highways	May 2024
Manston Airport	RiverOak Strategic Partners Ltd	August 2022
M25 Junction 10/A3 Wisley Interchange Improvement	Highways England	May 2022
M25 Junction 28 Improvements	Highways England	May 2022
Thurrock Flexible Generation Plant	Thurrock Power Ltd	February 2022
Wheelabrator Kemsley Generating Station (K3) and Wheelabrator Kemsley North (WKN) Waste to Energy Facility	WTI/EFW Holdings Ltd	February 2021
Southampton to London Pipeline Project	Esso Petroleum Company, Limited	October 2020
Cleve Hill Solar Park	Cleve Hill Solar Park Ltd	May 2020
Kemsley Paper Mill (K4) CHP Plant	DS Smith Paper Ltd	July 2019
Tilbury2	Port of Tilbury London Limited	February 2019
M20 Junction 10A	Highways England	December 2017
Richborough Connection Project	National Grid	August 2017
M4 Junctions 3 to 12 Smart Motorway	Highways Agency (now Highways England)	September 2016
Rampion Offshore Wind Farm	E.On Climate and renewables	July 2014
Kentish Flats Extension	Vattenfall	February 2013

The projects listed in

Table 6-5

Table 6-5

Table 6-5 are a mix of onshore and offshore energy developments, energy infrastructure and transport infrastructure. With regard to cumulative effects with the fdWRMP24, these are likely to centre on effects associated with the construction phase, if located in similar areas, or if there is coincidence of proposed linear infrastructure and pipeline routes. The implications of such effects will need to be considered in detail at the implementation stage of WRMP schemes, where there is coincidence in proposed phasing.

7 Mitigation

7.1 Overview

The SEA Regulations require that the Environmental Report includes 'The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme' (Schedule 2 (7)). SEA Regulation 12(3(d)) identifies that the report should include the information referred to in Schedule 2, taking account of 'the extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment'. This anticipates that some information would only be available at the consenting stage for individual schemes and identified through assessments such as Environmental Impact Assessment (EIA).

In accordance with the regulation requirements, this section describes how mitigation has been or will be addressed, as applicable and that the appropriate mitigation measures are implemented for any significant adverse effects identified. Mitigation may be defined as a measure to limit the effect of an identified significant impact or, where possible, to avoid the adverse impact altogether.

7.2 Mitigation measures

Consideration of mitigation measures has been an integral part of the SEA process and the selection of preferred options as part of the evolution of the fdWRMP24. Where options continue to demonstrate significant negative effect, taking into account mitigation measures, the implications of these significant negative effects will be considered as part of the further design and study work identified as part of the risk reduction programme. The detail of this mitigation needs to be considered during the planning phases of each of the individual measures if and when they are taken forward for implementation. This should then be consolidated into a Construction Environmental Management Plan (CEMP) for the scheme, noting that all works should be carried out in accordance with relevant Construction Design Management (CDM) Regulations 2015.

General good construction practice measures include:

- invasive species on site are to be identified and removed in advance of construction;
- HGV routing, cap on movements, appropriate working hours;
- screening around the perimeter of works at the start of construction (creation of landscaping/planting for large scale construction);
- footpath diversions established regarding construction work including pipelines;
- resources for construction of the scheme would be sourced locally where possible;
- minimising removal of spoil from construction sites;
- runoff from the construction sites would be attenuated and the quality managed according to best construction practices;
- appropriate pipeline laying techniques regarding river crossings;
- flood risk management during construction (temporary flood defence and siting of spoil and contaminants away from areas at risk of flooding);
- siting of temporary and permanent works to minimise impacts on setting of heritage and landscape features;
- archaeological watching briefs during excavation;
- noise abatement barriers where required;

- dust control measures: dampening dust emissions from groundworks and vehicle washing.

7.2.1 Species specific measures and biodiversity

Most species-specific avoidance or mitigation measures can only be determined at the scheme level, following scheme-specific surveys, and 'best-practice' mitigation for a species will vary according to a range of factors that cannot be determined at this stage. The CEMP should include measures to minimise disturbance to biodiversity during the construction phase, for example:

- scheme design should aim to minimise the environmental effects by 'designing to avoid' potential habitat features that may be important e.g. those used by species that are European site interest features when outside the site boundary (e.g. linear features such as hedges or stream corridors; large areas of scrub or woodland; mature trees; etc.) through scheme-specific routing studies;
- the works programme and requirements for each measure should be determined at the earliest opportunity to allow investigation schemes, surveys and mitigation to be appropriately scheduled and to provide sufficient time for consultations with NE;
- night-time working, or working around dusk / dawn, should be avoided to reduce the likelihood of negative effects on nocturnal species;
- any lighting required (either temporary or permanent) will be designed with an ecologist to ensure that potential 'displacement' effects on nocturnal animals, particularly designated bat species, are avoided;
- all materials will be securely stored away from migratory routes / foraging areas that may be used by designated species;
- all excavations will have ramps or battered ends to prevent species becoming trapped; and
- pipe-caps must be installed overnight to prevent species entering and becoming trapped in any laid pipe-work.

For all river water bodies that could be impacted by abstraction (either from surface water or groundwater), further ecological evidence has been identified as being required including:

- improving the understanding of the impacts of changes to flow on physical habitat parameters, and resulting impacts for species;
- improving the understanding of impacts of changes to flow on ability of fish to pass barriers; and
- undertaking further ecology surveys including macroinvertebrate and macrophyte surveys, and eDNA for fish (while some data is available in all water body catchments, there is variability in the extent of data and the most recent sample dates).

For GWDTEs identified as potentially being impacted by abstraction, further review of existing information is required to understand potential hydrological connectivity, as the current conclusions are relatively precautionary.

7.2.2 Scheme design and planning

All measures will be subject to project-level environmental assessment, which will include assessments of their potential to affect European sites during their construction or operation. These assessments should consider or identify (inter alia):

- opportunities for avoiding potential effects on European sites through design (e.g. alternative pipeline routes; micro-siting; etc);
- construction measures that need to be incorporated into scheme design and or planning to avoid or mitigate potential effects - for example, ensuring that sufficient space is available for pollution prevention measures to be installed, such as sediment traps; and

- operational regimes required to ensure no adverse effects occur (e.g. maintain minimal flows - although note that these measures can only be identified through detailed investigation schemes).

Specific additional measures identified in the assessment include:

- During operation, it is unknown if the saline waste from the proposed new desalination plants would be diluted within existing outflows therefore it is assumed hyper saline plumes would continue to effect designated habitats and species of the designated site. Impacts to benthic communities from concentrate discharges could be minimised by using properly-designed diffuser systems.

Specific enhancement measures will relate to the potential for the creation of new habitats associated with biodiversity net gain. These need to be considered on a scheme specific basis.

The current fdWRMP24 includes a number of desalination options in the western area:

- Desalination (KME): Isle of Sheppey options;
- Desalination (KTZ): East Thanet options;
- Desalination (KMW): Thames Estuary options.

For each option, the earliest delivery has been revised and delayed in the fdWRMP24 to allow sufficient time for investigation and mitigation options. The Isle of Sheppey and East Thanet desalination schemes are associated with uncertain effects on European sites. In consequence, the extension of the timeframe also allows Southern Water to engage with other water companies to review the proposed desalination options on the north Kent coast, with the intention, to be reflected in future plan cycles, of a revised, integrated solution, providing substantial yield to the benefit of customers, but appropriately sited to avoid and minimise the range of current identified option and cumulative effects.

7.2.3 Biodiversity Net Gain

Southern Water is committed to achieve the required 10% BNG for each relevant final draft WRMP24 option when implemented as a project level scheme, and exceed 10% BNG for those schemes that offer sufficient biodiversity uplift potential. Southern Water will systematically assess and manage the BNG of WRMP24 schemes at the project level using the latest Biodiversity Metric tool (currently Statutory Biodiversity Metric). These developments will be guided by best practice, in particular the BNG Good Practice Principles for Development . This approach to BNG is in line with Southern Water's wider company BNG Policy . Biodiversity is already a key aspect of Southern Water's Environmental Management System (EMS) and will be supported by internal BNG guidance.

7.2.4 Pollution prevention

There is a substantial body of general construction good-practice which is applicable to all of the proposed measures and can be relied on (at this level) to prevent significant or adverse effects on a European site or any waterbody occurring as a result of construction site-derived pollutants. The following guidance documents detail the current industry best-practices in construction that are relevant to the proposed schemes:

- DEFRA's Pollution prevention for businesses (https://www.gov.uk/guidance/pollution-prevention-for-businesses);
- Venables R. et al. (2000) Environmental Handbook for Building and Civil Engineering Projects. 2nd Edition. Construction Industry Research and Information Association (CIRIA), London.

The best-practice procedures and measures detailed in these documents should be followed for all construction works derived from the fdWRMP24 as a minimum standard, unless scheme-specific investigations identify additional measures and / or more appropriate non-standard approaches for dealing with potential site-derived pollutants.

Care should also be taken during construction regarding the potential for contaminants such as silt, concrete or fuel oil to pollute water courses via surface run off. This can be mitigated by undertaking all construction activities in accordance with relevant best practice pollution prevention guidance. Pollution Incident Control Management Plans should be developed to limit adverse effects arising from pollution events.

7.2.5 Effects on air quality

With regard to the potential for effects on air quality, the following measures should be considered for inclusion within the CEMP:

- use of low emission plant, air quality monitoring and preparation of a Dust Management Plan;
- a Construction Traffic Management Plan (CTMP) could be prepared for each preferred supply option to manage the traffic impacts associated with construction which would include measures to mitigate air quality effects including routing of traffic to avoid sensitive receptors and the timing of HGV movements to avoid peak traffic hours;
- low emission/electric vehicles should be used during the construction and operational phases where possible, consistent with the Water UK Net Zero 2030 Route Map and Southern Water's Net Zero Plan.

7.2.6 Effects on population and human health

With regard to the potential for effect on health, social and economic well-being, Southern Water could consider encouraging all its contractors are enrolled in the Considerate Constructors Scheme, a voluntary scheme which commits those contractors in the Scheme to be considerate and good neighbours, as well as clean, respectful, safe, environmentally conscious, responsible and accountable. The following measures should be considered for inclusion within the CEMP:

- care should be taken to avoid works near to the most sensitive health receptors In the development of detailed designs for pipeline routes;
- routing of traffic to avoid sensitive receptors and the timing and phasing of HGV movements to avoid peak traffic hours;
- construction activities should be undertaken so as to minimise short term adverse effects on recreational areas, such as footpaths, and on landscape and biodiversity.

To maximise economic benefits in the Southern Water operational area, it is recommended that, where possible, work is carried out by local firms and contractors or by those with a policy for training and skills development that could help contribute to the local economy and meet employment needs. Where possible, Southern Water should seek to use locally-sourced materials.

7.2.7 Effects of climate change and resource use

Southern Water's Net Zero Plan outlines mitigation measures that have already, or will be taken, to reduce their greenhouse gas emissions, The Plan focuses on the whole life carbon equivalent impact of Southern Water's activities and aims to design solutions that will act to reduce both embodied carbon and operational emissions.

The approach to achieving Net Zero follows the carbon reduction hierarchy and abides by four guiding principles:

- Ensuring carbon is a key focus by instilling carbon conscious decision-making and processes into the Southern Water culture.
- Participating in research and development of innovative solutions, by partnering with stakeholders across the sector and other water companies.

- Participating in trials, research and innovation with the wider sector will allow us to assess hard to abate emissions such as process emissions and implement suitable solutions in successive AMPs.
- Implementing an adaptive approach to planning to better manage the impact of external factors such as climate change, technological development, and consumer demand on our strategies in the future.

Mitigation measures outlined in the Net Zero Plan include:

- enhancing the efficiency of Southern Water's network and reducing water demand;
- shifting to renewable energy and onsite generation;
- deploying of thermal conversion technology and using of green fuels;
- improving energy efficiency of sites;
- reducing energy usage;
- reducing process emissions through consolidation of sites into mega-sludge treatment centres with advanced digestion technologies;
- electrifying the vehicle fleet or introducing low carbon fuel alternatives;
- implementing nature-based solutions;
- identifying opportunities for carbon storage and sequestration insets;
- developing natural capital solutions.

Further detail on Southern Water's Net Zero Plan is available in Section 10.5 of the fdWRMP24 and the Net Zero Plan itself.

In addition, Southern Water could consider:

- Design measures to ensure the long-term resilience of infrastructure to the effects of climate change. Measures may include, for example, the provision/enhancement of natural flood management measures as part of wider biodiversity enhancement and habitat creation.
- Measures to investigate and optimise the use of materials with lower embodied carbon and renewables for energy supply, consistent with the Water UK Net Zero 2030 Route Map.
- Completion of a carbon footprint study could help identify areas for carbon savings, offsets or alternative materials.

Where significant raw materials are required for options, this can be mitigated by utilising recycled and locally sourced materials. Construction and operational wastes should also be reused/recycled where appropriate.

7.2.8 Effects on cultural heritage and landscape

Reflecting the importance of avoiding harm to heritage significance, the potential for both direct and indirect adverse impacts on cultural heritage assets and their settings should be considered early in the design process and any adverse effects minimised, and where possible avoided, for example through micro-siting / alternative pipeline routes to avoid designated sites. Archaeological watching briefs should be used, where appropriate. Further measures, for consideration within the CEMP could include:

- careful consideration being given to the presence of heritage assets when finalising proposals for pipeline routing;
- where required, a programme of trial trenching and archaeological recording should be undertaken at development sites, with results disseminated;
- new above-ground infrastructure should be screened, where possible and informed by informed by a heritage appraisal/assessment, to minimise effects on the settings of heritage assets;

- consideration should be given to enhancing the significance of, and access to, heritage assets.

Proposed fdWRMP24 schemes could have a negative effect on landscape if new infrastructure is required, particularly where development cannot be located on previously developed land and/or where schemes are located within landscapes recognised for their importance and special qualities. In order to minimise such effects, new structures could be located close to existing structures or hedgerows and trees to provide some screening with the potential to utilise local building styles or incorporate landscaping schemes (e.g. tree/ hedge planting). Further measures, for consideration within the CEMP could include:

- where required, proposals should be accompanied by a lighting strategy that is designed to minimise outward glows;
- new above ground infrastructure should adopt high quality design principles where possible (for example, the use of local materials);
- proposals should be accompanied by a landscape mitigation plan, informed by a landscape and visual assessment (where required).

Southern Water's approach to Protected Landscapes is to ensure that the statutory purposes for which they are designated are recognised, protected and enhanced (where feasible) in reaching decisions and undertaking activities. When a development has the potential to affect protected landscapes SWS will seek to minimise negative impacts and to align actions with the relevant Protected Landscapes Management Plan as far as practicable.

When the potential for an effect on a protected landscape is identified, the mitigation hierarchy is then triggered. The first step in the hierarchy is to assess if the development can be relocated outside the protected area. While this is unlikely to be possible in many cases given the relationship of our projects with hydrogeological or hydrological features and existing infrastructure. In some cases (normally small wastewater sites) downsizing can be achieved by installation of a pumping station and suitable connecting pipework to a larger site to which flows are pumped away for treatment. However, other factors, including the carbon cost of continually pumping appreciable volumes of water in order to avoid construction within a national landscape would need to be considered on balance.

Potential options for mitigating impacts on protected landscape statutory purposes could include:

- Minimising unit height (including in some cases partial/entire placement below ground);
- Unit colouring or materials to minimise impact (including use of published colour guides);
- Green roofs/walls;
- Landscape topography modification (e.g. visual screening bunds); and
- Screening planting.

Opportunities for access to nature would be explored where possible and could include consideration of, where relevant, enhancement of PRoWs through or near to SWS sites.

With reference to mitigation aimed at protecting the special qualities of the landscapes, we will provide signage around our development site perimeters that explains our infrastructure work, including any details of the work we are carrying out to mitigate construction and operation impacts on the environment.

For any cumulative impacts that may arise from multiple schemes within the same Protected Landscape, we will seek not only to avoid harm to its special qualities, but also contribute to conservation

and enhancement of these qualities, in consultation with the local authority's relevant Protected Landscape team, and through measures that will be detailed on a locally specific case by case basis as projects are developed. A Protected Landscape Mitigation Strategy will also be developed which identifies the potential for multiple scheme impacts within our own or other water companies plans where the same protected landscapes may be affected over the plan period. The mitigation measures described above would, in the

majority of cases, be implemented through EIA and planning process. In this way, effective mitigation plans can be developed to minimise many of the residual adverse effects currently identified in the SEA appraisals.

7.3 Schemes with residual significant effects in AMP 8 and 9

The **only schemes predicted to have residual major negative effects during AMP 8 are the following drought supply-side options:**

- Drought option - supply side (SNZ): Pulborough surface water phases 1-3 (23Ml/d)
- Drought option - supply side (HSE): Candover (22Ml/d)
- Drought option - supply side (HSE): Lower Itchen
- Drought option - supply side (KMW): River Medway Scheme 1-4 (17Ml/d)

Given the nature of the options, to be used temporarily during certain drought conditions, there is a possibility that the identified residual significant major negative effects for these options may not materialise. There is currently no mitigation available to reduce the significance of residual effects. During AMP 8 and as part of the development of the next WRMP 2029, Southern Water will explore potential alternatives to the use of these drought options.

The assessment predicted that there is the potential for residual significant major negative effects as a result of three schemes proposed during AMP 9, these are:

- Groundwater (KME): Recommission Gravesend (2.7Ml/d) - The WFD assessment (2025) concludes that this option would be potentially non-compliant (with medium confidence) reflecting that the Stage 2 assessment concludes potential WFD non-compliance (with medium confidence) for the North Kent Medway Chalk groundwater body and potential WFD non-compliance (with low confidence) for the Ebbsfleet waterbody.
- Recycling (KMW): Medway WTW to lake (14Ml/d) - The WFD assessment (2025) concludes that this option would be potentially non-compliant (with medium confidence) reflecting that the Stage 2 assessment concludes potential WFD non-compliance (with medium confidence) for the Eccles Lake waterbody.

There is not sufficient information at this stage to propose specific mitigation to reduce the residual significance of effects. Further investigations and evidence based work will be needed during AMP 8 and as part of the next WRMP cycle to identify suitable mitigation to reduce the significance of residual effects or to identify suitable alternatives.

8 Assessment of the reasonable alternatives to the fdWRMP24

8.1 Introduction

The SEA Regulations (Regulation 12(2)) require that the Environmental Report 'shall identify, describe and evaluate the likely significant effects on the environment of

(a) implementing the plan or programme; and

(b) reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme'. Further to this, the regulations require (under Schedule 2 (8)) that the Environmental Report presents outline reasons for selecting the alternatives dealt with and a description of how the assessment was undertaken.

This chapter addresses these requirements for the SEA for Southern Water's fdWRMP24 and is structured as follows:

- Establishing Reasonable Alternatives - explains how the alternative programmes were identified.
- Assessment of Alternatives Plans - presents the findings of the assessment of alternatives.
- Cumulative Effects of the Alternative Plans - presents the cumulative effects assessment of the alternative plans compared to the preferred programme.

8.2 Establishing the alternatives

The primary objective of the fdWRMP24 is to ensure that there is always enough water available to meet anticipated demand in Southern Water's supply area, regardless of weather conditions. Working with WRSE, Southern Water have developed a set of best value planning objectives to ensure they can meet their statutory and policy requirements. These are:

- Deliver a secure and wholesome supply of water.
- Deliver environmental and social benefit.
- Increase the resilience of water systems.
- Deliver at a cost that is acceptable to customers.

These objectives are underpinned by a set of supporting environmental and social metrics that can be optimised through investment modelling. These metrics were developed in consultation with stakeholders and in line with the National Framework and WRPG. These are shown in **Table 8-1** below.

Table 8-1 Objectives, criteria and metrics for our Best Value Plan.

Best value objective	Criteria	Metric
Deliver a secure and wholesome supply of water to customers and other sectors to 2075	Meet the supply demand balance	Public water supply - supply demand balance profile (Ml/d) Provides additional water needed by other sectors (Ml/d)
	Leakage	50% reduction in leakage by each company by 2050 from 2017-18 baseline (%) % leakage reduction above 50%
	Water into supply	Distribution input (DI) per property (litres per day)

Best value objective	Criteria	Metric
	Customer preference	Customer preference for option type (score)
Deliver environmental improvement and social benefit	Strategic Environmental Assessment (SEA)	Programme benefit (score max) Programme disbenefit (score min)
	Natural capital	Enhancement of natural capital value (£m)
	Abstraction reduction	Reduction in the volume of water abstracted at identified sites (Ml/d) and by when (date)
	Biodiversity	Net gain score (%)
	Carbon	Cost of carbon offsetting (£m)
Increase the resilience of the region's water systems	Drought resilience	Achieve 1:500 drought resilience (date achieved)
	Resilience assessment reliability	Programme reliability score
	Resilience assessment adaptability	Programme adaptability score
	Resilience assessment evolvability	Programme evolvability score
Deliverable at a cost that is acceptable to customer	Programme cost	Net present value (£m) using the social time preference rate (STPR)
	Inter-generational equity	Net present value (£m) using the long-term discount rate (LTDR)

As highlighted in **Table 8-1** above, the findings of the environmental assessments including the SEA were translated into metrics and these were:

- Four metrics derived from the SEAs (outlined in Chapter 4 above): 1) Positive construction, 2) Negative construction, 3) Positive operation, and 4) Negative operation.
- One metric derived from the natural capital and ecosystem services assessments (outlined in Chapter 4 above): Change in monetary value (£/year) of ecosystem services (combining carbon sequestration, food production, air pollution, natural hazard management, and recreation and amenity).
- Two biodiversity impact metrics derived from application of the Biodiversity Net Gain 3.0 metric (outlined in Chapter 4 above): 1) Total net change in habitat units, and 2) Habitat units requiring replacement, which was either presented as habitat units required to achieve 10% net gain or for options already achieving 10% net gain, the value for this was 0.

These metrics enabled the SEA, HRA, WFD assessment, Natural Capital and Biodiversity Net Gain findings to be directly considered in analysis and selection of programmes of options at an early stage in the planning process. For incorporation of the environmental assessments into modelling, it was assumed that recommended mitigation measures will be applied, e.g. the SEA metric findings were based on the predicted residual effects on the environment.

Long-term planning requires making decisions for an uncertain future. To manage uncertainty, WRSE and Southern Water have used an adaptive planning approach. They have looked at multiple supply-demand balance scenarios in view of the uncertainties associated with growth forecasts, the level of reductions required in the water taken from the environment and climate change impacts. An adaptive planning approach means that these different futures and uncertainties can be taken into account.

A total of nine branches (hereafter referred to as 'situations') cover these future conditions/ uncertainties, which were derived based on combinations of the three key drivers:

- Growth; which determines the demand that will need to be met in the future.
- Climate change; which impacts the amount of water we can abstract from our current sources.

- Environmental Destination; which determines the reductions that need to be made in abstractions from aquifers and rivers in order to preserve or enhance the environment going forward.

The final nine situations were therefore made up of representative combinations of these driver specific forecasts (high, medium and low) within each plan. To make the plan adaptive the forecasts were introduced in two stages over time, which are referred to as the 'branch points'. Population and housing growth are key drivers up to 2035, with climate change and environmental destination then being brought in from 2035 onwards. These forecast drivers and branch points are set out in **Table 8-2** below.

Table 8-2 Key forecast drivers and situations.

2025 to 2030	2030 to 2035	2035 to 2075	
Medium Growth	**High** Growth	Situation 1	**High** Growth (H-Max)
			High Climate Change
			High Env Destination
		Situation 2	**High** Growth
			Medium Climate Change
			Medium Env Destination
		Situation 3	**High** Growth
			Low Climate Change
			Low Env Destination
	Medium Growth	Situation 4	**Medium** Growth
			High Climate Change
			High Env Destination
		Situation 5	**Medium** Growth
			Medium Climate Change
			Medium Env Destination
		Situation 6	**Medium** Growth
			Low Climate Change
			Low Env Destination
	Low Growth	Situation 7	**Low** Growth
			High Climate Change
			High Env Destination
		Situation 8	**Low** Growth
			Medium Climate Change
			Medium Env Destination
		Situation 9	**Low** Growth
			Low Climate Change
			Low Env Destination

To support a robust evaluation of alternatives, an investment model was used to examine how the alternative programmes changed as the inputs to the values used in the adaptive framework changed. The investment model was run multiple times to examine the potential sensitivity of the plan to changes inputs, optimisation criteria and different policy choices, these were:

- **Development of a Least Cost (Cost Efficient) Plan (LCP)** which optimised only on programme cost but still tracked all best value metrics. The best value metrics are presented in **Table 8-1** earlier. The LCP was developed to meet the projected supply-demand deficit in each supply-demand balance situation, under each planning scenario. For this planning approach, the investment model

optimised only on lowest economic cost, expressed in terms of Net Present Value (NPV). Although the best value metrics were not optimised on at this stage, the options used to develop the LCP still have scores for these metrics against each situation.

- **Best Value model runs** to examine the trade-off between programme cost and best value metrics. The highest score for each best value metric was determined by the highest threshold for which the investment model was able to resolve the supply-demand deficit.
- **Policy and sensitivity assessments** which include different programmes based on policy choice. These included:

Many of the sensitivity runs resulted in unresolved supply-demand deficits but in most cases, these occur in isolated years rather than as continuous deficits over multiple years. In the vast majority of cases, the deficits occur in a 1-in-100 year drought event.

It should be noted that there are two versions of the LCP:

1. Regional LCP (RLCP): This version of the LCP has updates to all inputs from all WRSE companies since the dWRMP24 but not the revised dates for the delivery of Littlehampton and Sandown recycling options, the HWTWRP and the Havant Thicket Reservoir.
2. Southern Water LCP (SLCP): This version of the LCP has the solution from RLCP partially fixed for all areas except those directly impacted by the changes in the delivery dates of Littlehampton and Sandown recycling option, HWTWRP and Havant Thicket Reservoir i.e. Central area, Western area and Portsmouth Water supply area.

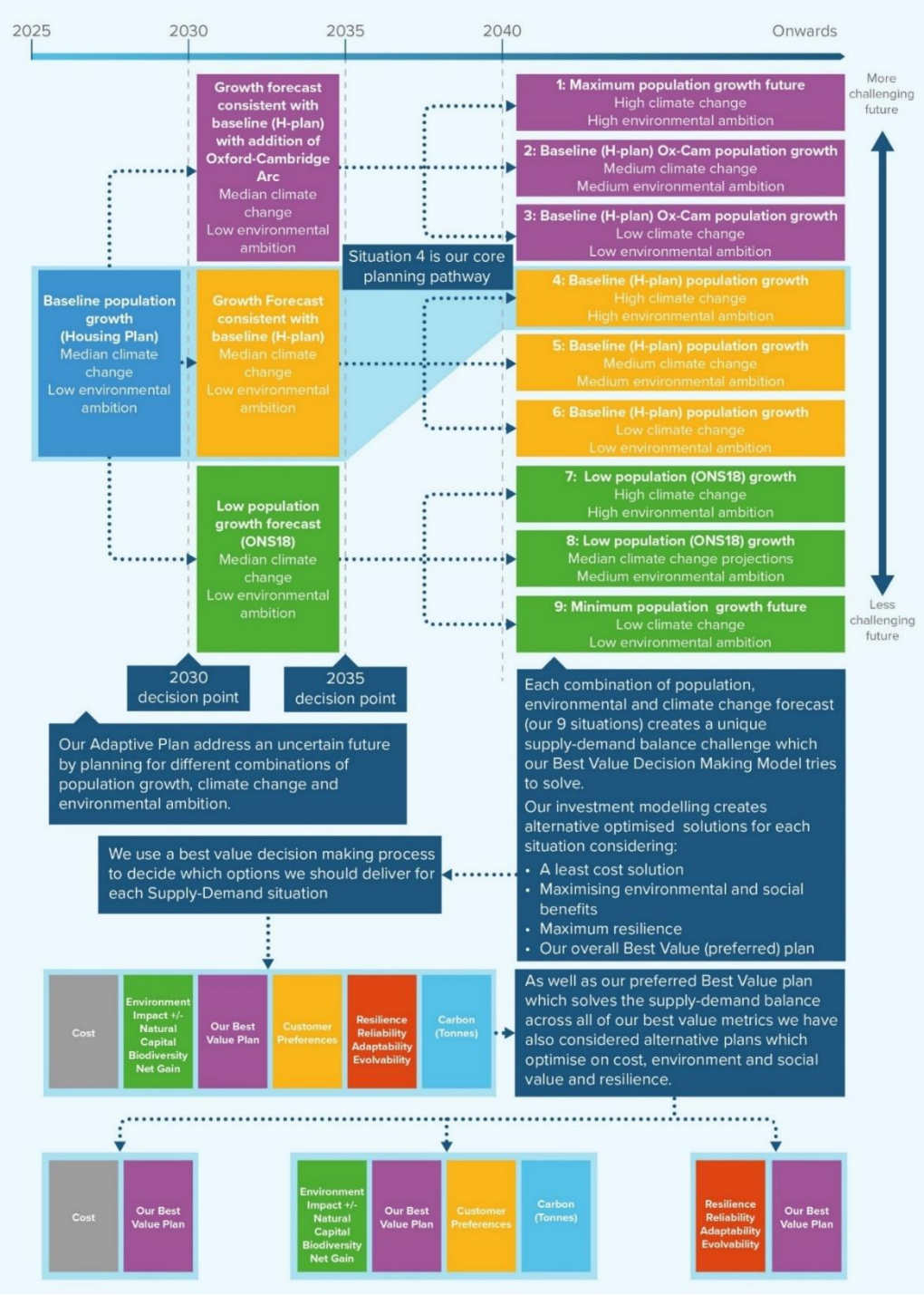
A summary of Southern Water's adaptive planning approach is presented in Figure 3 below.

Following the investment model runs, it was determined that there are two alternatives programmes that should be considered through the SEA process alongside Southern Water's BVP (SBVP), the SLCP and the Regional Best Value Environment and Societal Plan (BESP). While the SLCP is only optimised on programme cost, it does meet the projected supply-demand deficit in each situation and the WRPG states that a least cost programme should be produced as a benchmark to appraise your other programmes against and be informed by the SEA. The RLCP has not been carried forward as it does not reflect the revised dates for the delivery of Littlehampton and Sandown recycling option, the HWTWRP and the Havant Thicket Reservoir.

The BESP has also been carried forward for further consideration through the SEA process. It seeks to optimise the environmental metrics and remove the resilience metrics while still meeting the projected supply-demand deficit. Assessing an alternative plan that focuses on optimising the environmental metrics (SEA, Natural Capital, BNG and carbon) rather than costs and resilience is considered reasonable and aligned with positive environmental outcomes. While this alternative plan selects a number of schemes that are identified as likely to have adverse effects on the environment, it is still considered reasonable as there are no other viable alternative individual schemes available at this stage to replace them and therefore meet the supply-demand deficit under some of the more challenging futures.

Situation 4 as the 'reported or core pathway' in the fdWRMP24 has been taken forward for consideration through the SEA in terms of the alternative plans. Situation 4 has been chosen as the core pathway as a result of regulatory feedback during pre-consultation. The EA requested that the reported pathway accounts for both housing plan growth and BAU+ environmental destination.

Figure 3: Summary of Southern Water adaptive planning approach.



Given the scale of the supply-demand deficit and challenges being faced, the investment model often selects the majority of schemes available. As a result, there are limited differences between the options being selected. The differences between the SBVP, SLCP and BESP in terms of the selected schemes and implementation dates are presented **Table 8-3** below.

Table 8-3 Key differences between BVP, SLCP and BESP.

Option	Earliest selection in SLCP	Earliest selection in BVP	Earliest selection in BESP
Central area - Sussex North (SNZ) WRZ			
Bulk import (SNZ): SES to SNZ (10Ml/d)	Not selected	2040	2040
Recycling (SNZ): Horsham with storage at Pulborough (6.8Ml/d)	2050	2058	2059
Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d)	2042	2046	2046
Central area - Sussex Worthing (SWZ) WRZ			
Desalination (SWZ): Tidal River Arun (10Ml/d)	2046	2046	Not selected
Desalination (SWZ): Tidal River Arun (20Ml/d)	2046	2041	2041
Desalination (SWZ): Tidal River Arun (20Ml/d) Phase 2	2050	2050	2048
Central area - Sussex Brighton (SBZ) WRZ			
No differences between the alternative plans in this WRZ			
Western area - Hampshire Kingsclere (HKZ) WRZ			
Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d)	Not selected	2050	2052
Bulk import (HKZ): T2ST to HKZ (5Ml/d)	Not selected	2049	2049
Western area - Hampshire Andover (HAZ) WRZ			
Groundwater (HAZ): Recommission Chilbolton (0.5Ml/d)	2068	2073	Not selected
Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d)	Not selected	2050	2031
Western area - Isle of Wight (IOW) WRZ			
No differences between the alternative plans in this WRZ			
Western area - Hampshire Rural (HRZ) WRZ			
Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve (3.1Ml/d)	2026	2026	2031
Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve (5Ml/d)	2031	2031	Not selected
Western area - Hampshire Winchester (HWZ)			

Option	Earliest selection in SLCP	Earliest selection in BVP	Earliest selection in BESP
No differences between the alternative plans in this WRZ			
Western area - Hampshire Southampton East (HSE) WRZ			
No differences between the alternative plans in this WRZ			
Western area - Hampshire Southampton West (HSW) WRZ			
No differences between the alternative plans in this WRZ			
Eastern area - Kent Medway East (KME) WRZ			
Desalination (KME): Isle of Sheppey (20Ml/d)	2041	2041	2040
Desalination (KME): Isle of Sheppey (20Ml/d) Phase 2	Not selected	Not selected	2051
Eastern area - Kent Medway West (KMW) WRZ			
Desalination (KMW): Thames Estuary (10Ml/d) Phase 2	2041	2041	2040
Desalination (KMW): Thames Estuary (20Ml/d) Phase 2	2040	2040	2041
Eastern area - Kent Thanet (KTZ) WRZ			
Desalination (KTZ): East Thanet (20Ml/d) Phase 2	2057	2051	2051
Eastern area - Sussex Hastings (SHZ) WRZ			
Bulk import (SHZ): SEW RZ8 to Rye	2050	2050	2060
Recycling (SHZ): Hastings to Darwell (15.3Ml/d)	2051	2051	2050
Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d)	Not selected	2036	Not selected
Recycling (SHZ): Tunbridge Wells with Bewl (3.6Ml/d)	2036	Not selected	2036
Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d)	2055	2061	2057

8.3 Assessment of alternatives

As explained in Section 4, the assessment of the alternative programmes builds on the assessment for the BVP presented in Chapter 5, 6 and 7. The assessment below highlights if there are any differences in the likely significant effects identified for the BVP in relation to the alternative pans (SLCP and BESP).

8.3.1 Central area

Sussex North (SNZ) WRZ

Amendments to the delivery dates of schemes selected in the alternative plans will not result in any changes to the significance or nature of effects identified for the BVP in Section 5; however, they will result in changes to when those effects will occur. For example, in the BVP the Recycling (SNZ): Horsham with storage at Pulborough (6.8Ml/d)scheme will be delivered in 2058, whereas in the SLCP delivery would be in 2050 and BESP 2059. The predicted effects for this option would therefore remain the same but occur at a different time compared to the BVP in the planning horizon. Further consideration will be given to these changes in implementation dates later in this section under cumulative effects. The only difference in terms of delivery dates is that in the BVP Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) scheme will be delivered in 2026, whereas the SLCP delivery of the scheme would be in 2042. Again, the predicted effects for this option would remain the same but occur 4 years prior to that of the BVP in the planning horizon.

There is only one difference in terms of the schemes being selected in this WRZ under the alternative plans. (Bulk import (SNZ): SES to SNZ (10Ml/d)) is selected under the BVP and BESP and not selected under the SLCP. This scheme is not predicted to have any residual moderate or major effects during construction or operation. Minor residual negative effects are predicted during construction for SEA objectives relating to biodiversity, water quality, air, climatic factors, the historic environment, population and human health as well as material assets. During operation this option is predicted to predominantly have a residual neutral effect except for water reliability for which a minor positive effect is identified. In summary, the SLCP and BESP are not likely to result in any changes to the significance or nature of effects identified for the BVP in this WRZ.

Sussex Worthing (SWZ) WRZ

The key differences between the alternative plans within this WRZ relate to the selection of and delivery dates for Desalination (SWZ): Tidal River Arun. This scheme can be built in a modular fashion to provide up to 40M/d. Ultimately there is only minor differences between the BVP and the alternative plans in terms of delivery dates and the nature and significance of effects would not change just when they will occur in the planning horizon. For example, the SLCP proposes a later delivery date for the scheme in 2046 compared to 2041 in the BVP and BESP. The 10Ml/d version of the scheme is not selected under the BESP; however, this would not result in the removal or addition of any identified significant effects compared to the BVP.

Sussex Brighton (SBZ) WRZ

The SLCP and BESP do not propose the addition of any new, the removal of any existing schemes and/ or changes to implementation dates selected under the BVP. As a result, the alternative plans are predicted to have the same effects as the BVP in this WRZ, which are presented in Section 5.

8.3.2 Western area

Hampshire Kingsclere (HKZ) WRZ

Amendments to the delivery dates of schemes selected under the alternative plans (SLCP and BESP) will not result in any changes to the significance or nature of effects identified for the BVP in Section 5; however, they will result in changes to when those effects will occur. For example, the BESP proposes the delivery of drought options earlier in the planning horizon in 2026 compared to the BVP and SLCP in 2035. The BESP also proposes the delivery of an interzonal transfer earlier in 2031 compared to the BVP in 2050. The interzonal transfer option is not selected for the SLCP. Further consideration will be given to these changes in implementation dates later in this section under cumulative effects.

There are two differences in terms of the schemes being selected in this WRZ under the SLCP compared to the BVP and BESP. Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) and Bulk import (HKZ): T2ST to HKZ (5Ml/d) schemes are selected under the BVP and BESP and not selected under

the SLCP. These schemes are predicted to have minor residual negative effects during construction and operation for the majority of SEA objectives. A residual moderate negative effect is identified in relation to landscape during construction given the schemes fall within the North Wessex Downs National Landscape. As a result, this potential disturbance to the National Landscape would not occur under the BVP and BESP.

Hampshire Andover (HAZ) WRZ

Amendments to the delivery dates of schemes selected under the alternative plans (SLCP and BESP) will not result in any changes to the significance or nature of effects identified for the BVP in Section 5; however, they will result in changes to when those effects will occur.

There are two differences in terms of the schemes being selected in this WRZ under the alternative plans. Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d) is selected under the BVP (implementation in 2050) and BESP (implementation in 2031) and not selected under the SLCP. This scheme is predicted to have minor residual negative effects during construction and operation for the majority of SEA objectives. A residual moderate negative effect is identified in relation to landscape during construction given the scheme falls within the North Wessex Downs National Landscape. As a result, this potential disturbance to the National Landscape would not occur under the SLCP. Groundwater (HAZ): Recommission Chilbolton (0.5Ml/d) is selected under the BVP (implementation in 2073) and SLCP (implementation in 2068) and not selected under the BESP. This scheme is predicted to have minor residual negative effects during construction and operation for the majority of SEA objectives. A residual moderate negative effect is predicted against the SEA objective relating to resource use and waste production. This is primarily as a result of the scale of the option in terms of new infrastructure.

Isle of Wight (IOW) WRZ

There are no differences between the SLCP, BESP or BVP within this WRZ, in terms of schemes selected or their implementation dates. As a result, there are no differences in the assessment of likely significant effects presented for the BVP in Section 5.

Hampshire Rural (HRZ) WRZ

There are no differences between the schemes selected and delivery dates for the BVP compared to the SLCP. The BESP only selects Interzonal transfer (HSW-HRZ): Romsey Town and Broadlands valve (3.1Ml/d) a lower yield version of the scheme whereas the BVP and SLCP also select a higher yield version of the scheme that would deliver 5.1Ml/d/. The BESP proposes the delivery of this option five years later (in 2031) compared to the BVP and SLCP. No residual major or moderate effects were identified for either scheme during construction or operation. AS a result, it is not considered that there are any significant differences in terms of significant effects between the BVP and alternative plans.

Hampshire Winchester (HWZ) WRZ

The SLCP and BESP do not propose the addition of any new, the removal of any existing schemes and/ or changes to implementation dates selected under the BVP. As a result, the alternative plans are predicted to have the same effects as the BVP in this WRZ, which are presented in Section 5.

Hampshire Southampton East (HSE) WRZ

The SLCP and BESP do not propose the addition of any new, the removal of any existing schemes and/ or changes to implementation dates selected under the BVP. As a result, the alternative plans are predicted to have the same effects as the BVP in this WRZ, which are presented in Section 5.

Hampshire Southampton West (HSW) WRZ

There are no differences between the SLCP, BESP or BVP within this WRZ in terms of schemes selected or their implementation dates. As a result, there are no differences in the assessment of likely significant effects presented for the BVP in Section 5.

8.3.3 Eastern area

Kent Medway East (KME) WRZ

The key differences between the alternative plans within this WRZ relate to the selection of and delivery dates for Desalination (KME): Isle of Sheppey. This scheme can be built in a modular fashion to provide up to 40M/d. Ultimately there is only minor differences between the BVP and the alternative plans in terms of delivery dates for Desalination (KME): Isle of Sheppey (20Ml/d) with the BVP and SLCP proposing delivery in 2041 and the BESP delivery in 2040. As a result, nature and significance of effects would not change just a minor difference on when they will occur under the BESP in the planning horizon. The Desalination (KME): Isle of Sheppey (20Ml/d) Phase 2 is not selected under the BVP or the SLCP, the BESP selects the scheme to be delivered in 2051; however, this would not result in the removal or addition of any identified significant effects compared to the BVP.

Kent Medway West (KMW) WRZ

There are no significant differences between the BVP and alternative plans in this WRZ in terms of the schemes selected or delivery dates. The BESP proposes a slightly different sequencing to the phasing of development but this is only by one year. As a result, the alternative plans are predicted to have the same effects as the BVP in this WRZ, which are presented in Section 5.

Kent Thanet (KTZ) WRZ

The SLCP and BESP do not propose the addition of any new, or the removal of any existing schemes selected under the BVP. As a result, the alternative plans are predicted to have the same effects as the BVP in this WRZ, which are presented in Section 5. In terms of delivery dates, the BVP and BESP select Desalination (KTZ): East Thanet (20Ml/d) Phase 2 for delivery in 2051 whereas the SLCP has a delivery date six years later in 2057. As a result, there will be no difference in the nature or significance of effects identified but they are likely to occur late in the planning horizon under the SLCP.

Sussex Hastings (SHZ) WRZ

There are three schemes where there are differences in proposed delivery dates between the BVP and alternative plans. Bulk import (SHZ): SEW RZ8 to Rye is proposed for delivery in 2050 under the BVP and SLCP and in 2060 under the BESP. Recycling (SHZ): Hastings to Darwell (15.3Ml/d) is proposed for delivery in 2051 under the BVP and SLCP and in 2050 under the BESP. Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d) is proposed for delivery in 2061 under the BVP and in 2055 under the SLCP and 2057 under the BESP. While there will be no differences between the BVP and alternative plans in terms of the nature and significance of effects there will be differences in when these effects occur as a result of these schemes during the planning horizon.

Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d) and Recycling (SHZ): Tunbridge Wells with Bewl (3.6Ml/d) are essentially the same scheme but with different yields. Recycling (SHZ): Tunbridge Wells with Bewl (3.6Ml/d) is selected in the SLCP and BESP in 2036 and not selected in the BVP. Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d) is selected in the BVP in 2036 and not selected in the SLCP and BESP. In summary, the higher yield option is selected in the BVP, while the alternative plans include the lower yield scheme.

A residual moderate negative effect is identified for the Water SEA objective during construction. The option intersects nitrate vulnerable zones, SPZ2 and overlies the Kent Weald Western - Medway WFD groundwater body. Residual minor negative effects are identified for a number of other SEA objectives (biodiversity, soil, air, climatic factors, landscape, historic environment, material assets and population and human health) during construction.

Residual minor negative effects during operation were identified as a result of operational carbon emissions as well as flood risk, as the existing Tunbridge WTW may require site expansion and it is within or within close proximity to flood zones 2 and 3. Residual minor positive effects are also identified during operation as a result of helping to deliver reliable and resilient water supplies. A residual major negative effect is identified

for water quality as the WFD assessment found potential WFD non-compliance (with medium confidence) regarding discharge into Bewl water. The WFD assessment (2025) identifies that new discharge of treated effluent could potentially result in physico-chemical effects that could impact on biological status elements. Macrophytes are already at Poor status, and the option could make it more difficult to achieve future improvements. A new discharge into the reservoir could potentially change the physico-chemistry of the water body, for example by increasing nutrient concentrations, changing dissolved oxygen concentrations, and changing water temperature. The water body already fails for phosphate, which is at Poor status, and the introduction of treated effluent (depending on the final discharge quality) could worsen this or prevent future improvements. Further assessment is therefore required to consider the final characteristics of the new discharge and ensure that water quality is not compromised.

8.4 Assessment of the effects of the demand management options

There are no differences to the demand schemes selected under the BVP compared to the alternative plans (SLCP and BESP). As a result, the findings on likely significant effects presented in Section 5 for the BVP demand management options are also valid for the alternative plans.

8.5 Summary of significant effects by WRZ

The alternative plans do not include any new schemes or remove any existing schemes selected under the preferred programme (BVP) that are predicted to result in a significant (major) effect. As a result, the summary of significant effects presented for the preferred programme (BVP) in Section 5.8 and in Appendix L Summary of Post Mitigation Significant Effects by Water Resource Zone Options are also valid for the alternative plans.

There are some differences between the selection of schemes in two WRZs (HKZ and HAZ) and the exclusion of these schemes from the BVP might avoid the potential for residual moderate effects at a local scale. However, there would be no significant differences at a plan level.

8.6 Cumulative effects of the alternative plans

The cumulative effects (post mitigation) associated with the preferred programme (BVP) are presented in Section 6 of this report. Table 8-4 below builds on this work and presents the cumulative effects (post mitigation) of the alternative programmes (SLCP and BESP) compared to the BVP. In summary, there are no significant differences between the preferred programme (BVP) and alternative programmes in relation to the predicted cumulative effects.

Table 8-4 Cumulative effects assessment of the alternative plans.

SEA topic	SEA objective	BVP cumulative score Construction (Post mitigation)	BVP cumulative score Operation (Post mitigation)	Commentary	SLCP cumulative score Construction (Post mitigation)	SLCP cumulative score Operation (Post mitigation)	BESP cumulative score Construction (Post mitigation)	BESP cumulative score Operation (Post mitigation)
Biodiversity, flora and fauna	Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	---	+/---	The amended implementation dates and changes to schemes proposed under the alternative plans do not significantly affect the findings of the cumulative effects for the BVP. The alternative plans are still likely to have a significant negative cumulative effect during construction and operation as a result of schemes that are common across the plans. As for the BVP, minor cumulative positive effects are also likely during operation for the alternative plans through the delivery of BNG across the programme and provision of ecosystem services associated with habitat creation and enhancement such as new woodland sequestrating carbon.	---	+/---	---	+/---
Soil	Protect and enhance the functionality, quantity and quality of soils	--	-	The alternative plans are also likely to lead to the cumulative permanent loss of soils, including best and most versatile agricultural land. As for the BVP, the residual effects in the operation phase of the alternative plans are expected to be minor, reflecting that the majority of schemes (pipelines) will allow for full reinstatement.	--	-	--	-

SEA topic	SEA objective	BVP cumulative score Construction (Post mitigation)	BVP cumulative score Operation (Post mitigation)	Commentary	SLCP cumulative score Construction (Post mitigation)	SLCP cumulative score Operation (Post mitigation)	BESP cumulative score Construction (Post mitigation)	BESP cumulative score Operation (Post mitigation)
Water	Increase resilience and reduce flood risk	-	-	As for the BVP, a number of schemes selected under the alternative plans are located partially within Flood Zones 2 or 3. No differences in the cumulative effects predicted for the BVP compared to the alternative plans. For both construction and operation, cumulative minor negative effects are assessed.	-	-	-	-
	Protect and enhance the quality of the water environment and water resources	-	---	The alternative plans also include options that are identified through the WFD assessment as being non-compliant (with medium confidence). The BESP includes an additional option identified as being non-compliant (with medium confidence) but this does not change the potential significance of the residual effect which already major. As a result, cumulative significant negative effects are also predicted for the alternative plans during operation. A number of options would involve construction work across waterbodies or are close to waterbodies. This will require mitigation measures to minimise or avoid impacts on water environment. Cumulative minor negative effects are assessed for the construction phase.	-	---	-	---

SEA topic	SEA objective	BVP cumulative score Construction (Post mitigation)	BVP cumulative score Operation (Post mitigation)	Commentary	SLCP cumulative score Construction (Post mitigation)	SLCP cumulative score Operation (Post mitigation)	BESP cumulative score Construction (Post mitigation)	BESP cumulative score Operation (Post mitigation)
	Deliver reliable and resilient water supplies	0	+++	As for the BVP, the alternative plans would deliver increased capacity across the Southern Water area which will help to ensure a reliable and resilient water supply. Overall, in the operation phase the BVP and alternative plans would be expected to deliver significant positive effects against this SEA objective. Cumulatively neutral effects are assessed in the construction phase.	0	+++	0	+++
Air	Reduce and minimise air emissions	--	-	As for the BVP, construction of the alternative plan schemes will generate emissions to air (predominantly through vehicle emissions) which could affect local air quality. Overall, at the plan level there are no significant differences between the BVP and alternative plans. It is concluded that the alternative plans are likely to result in cumulative moderate negative effects during the construction phase. In the operational phase these effects linked to vehicle movements are expected to be lower than during construction with residual minor effects likely remain for the alternative plans as a whole.	--	-	--	-
Climatic factors	Reduce embodied and operational carbon emissions	---	+/---	The alternative plans are predicted to have similar cumulative effects compared to the BVP against this SEA objective. The construction of the	---	+/---	---	+/---

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SEA topic	SEA objective	BVP cumulative score Construction (Post mitigation)	BVP cumulative score Operation (Post mitigation)	Commentary	SLCP cumulative score Construction (Post mitigation)	SLCP cumulative score Operation (Post mitigation)	BESP cumulative score Construction (Post mitigation)	BESP cumulative score Operation (Post mitigation)
				alternative plan schemes will require materials with embodied carbon as well as generate a substantial volume of vehicle movements which will contribute to carbon emissions. In the operational phase the alternative plans would also incur ongoing carbon emissions associated with the energy used e.g. pumping stations, WTW works, desalination plants. Cumulatively, this is likely to be significant. As for the BVP, the demand management options will see a reduction in carbon linked to reduced demand for water, whilst drought options would reduce use which would likely see reduced energy consumption.				
	Reduce vulnerability to climate change risks and hazards	0	++/--	Cumulatively the alternative plan schemes would increase the capacity of water supply within the Southern Water area as for the BVP with a moderate positive effect during operation. However, there may be some cumulative moderate negative effects in relation to the application of the drought measures (linked to increased abstraction). The resilience is unlikely to be affected in the construction phase and therefore neutral effects are assessed.	0	++/--	0	++/--

SEA topic	SEA objective	BVP cumulative score Construction (Post mitigation)	BVP cumulative score Operation (Post mitigation)	Commentary	SLCP cumulative score Construction (Post mitigation)	SLCP cumulative score Operation (Post mitigation)	BESP cumulative score Construction (Post mitigation)	BESP cumulative score Operation (Post mitigation)
Landscape	Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	---	-	As for the BVP, the alternative plans include a number of schemes that either partially pass through or are wholly within nationally designated landscapes. Overall, given the number of schemes there is likely to be a cumulative significant negative effect on landscape in the construction phase but these effects will be temporary as the majority of schemes involve pipelines that will not be visible during operation. Minor negative effect also predicted during operation as a result of some visible new infrastructure.	---	-	---	-
Historic environment	Conserve, protect and enhance the historic environment, including archaeological remains	--	-	As for the BVP, the alternative plans include several options that are located within or in close proximity to designated heritage assets. Post mitigation of the effects, these schemes are not predicted to have significant effects during construction. There is the potential for residual minor cumulative effects during operation where above ground infrastructure falls within the setting of designated heritage assets.	--	-	--	-

SEA topic	SEA objective	BVP cumulative score Construction (Post mitigation)	BVP cumulative score Operation (Post mitigation)	Commentary	SLCP cumulative score Construction (Post mitigation)	SLCP cumulative score Operation (Post mitigation)	BESP cumulative score Construction (Post mitigation)	BESP cumulative score Operation (Post mitigation)
Population and human health	Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	--	+++/-	At a plan level, there are no significant differences between the BVP and the alternative plans in terms of cumulative effects against this SEA objective. The construction of water resources infrastructure can temporarily adversely affect health and wellbeing through the generation of traffic, noise, vibration, emission to air. In the operational phase the positive effects on health primarily relate to the provision of clean drinking water alongside demand management and leakage reduction of across the Southern Water area, which taken together are considered significant. However, some drought measures (such as the non-essential use ban and reduction to provision to commercial customers, which may impact some businesses) will likely have negative impacts in the operational phase.	--	+++/-	--	+++/-
	Maintain and enhance tourism and recreation	--	-	As for the BVP, the location of some options selected under the alternative plans will mean that there are inevitable impacts on recreational facilities either indirectly (in terms of noise or disturbance) or directly. Cumulatively, given the temporary nature and mitigation measures employed, this is likely to be moderate. Cumulatively, minor	--	-	--	-

SEA topic	SEA objective	BVP cumulative score Construction (Post mitigation)	BVP cumulative score Operation (Post mitigation)	Commentary	SLCP cumulative score Construction (Post mitigation)	SLCP cumulative score Operation (Post mitigation)	BESP cumulative score Construction (Post mitigation)	BESP cumulative score Operation (Post mitigation)
				negative effects are assessed for the BVP and alternative plans as a whole as a result of drought options that could restrict water supply for tourism and recreation.				
Material assets	Minimise resource use and waste production	---	--	As for the BVP, given the cumulative concrete, steel and plastics that will likely be required to construct the alternative plan options there is likely to be a significant amount of waste generated (although there is some potential for re-use of materials and sustainable design measures). Cumulative significant negative effects have therefore been predicted. In the operation phase there will be ongoing production of waste linked to chemical treatment of water and generation of brine from desalination as a result of the BVP and the alternative plans. Cumulatively, this is likely to be moderately negative.	---	--	---	--
	Avoid negative effects on built assets and infrastructure	--	0	As for the BVP, a number of options intersect with major roads, railway lines and national cycle routes, whilst others are located within built up areas. Cumulatively, there is therefore likely to be some disruption to built assets and infrastructure during the construction phase, including the need for road closures and diversions. Cumulatively, this is	--	0	--	0

SEA topic	SEA objective	BVP cumulative score Construction (Post mitigation)	BVP cumulative score Operation (Post mitigation)	Commentary	SLCP cumulative score Construction (Post mitigation)	SLCP cumulative score Operation (Post mitigation)	BESP cumulative score Construction (Post mitigation)	BESP cumulative score Operation (Post mitigation)
				considered likely to be moderate negative. In the operation phase, neutral cumulative effects are assessed given infrastructure will be in situ.				

8.6.1 Cumulative effects of the alternative plans summary

At the plan level, there are no significant differences between the preferred programme (BVP) and the alternative plans (SLCP and BESP) in terms of predicted cumulative effects. Changes in implementation dates could result in some differences to cumulative effects at a more localised scale, for example at an individual WRZ level, but these would not affect the overall cumulative effects predicted for the plans. The alternative plans do not propose the removal or inclusion of any individual schemes that would alter the significant (major) effects identified for the BVP. These changes to schemes are not considered to result in any significant differences to the cumulative effects predicted at the plan level for the preferred programme (BVP).

9 Next Steps and proposals for monitoring

9.1 Conclusions

Southern Water's forecasts in the fdWRMP24 show that as a consequence of growth, Environmental Destination commitments and climate change, there are significant deficits forecast through to 2075 (estimated to be 280.17 Ml/d in 2035 and 552.58 Ml/d in 2075 in the 1-in-500 year or 1:500 Dry Year Annual Average (DYAA)). In consequence, Southern Water are undertaking a considerable amount of environmental investigation through to 2027 to help to reduce the uncertainty around the possible magnitude of any licence changes required to achieve Environmental Destination.

The forecast deficit will be addressed through the implementation of new options to increase supply as well as measures to reduce demand, including reduction in both leakage and water consumed by household and non-household customers. Following the application of the decision-making tools and testing to some 300 constrained options, Southern Water has identified a total of 123 preferred options comprising of 60 preferred supply options, 6 supply side drought options, 40 demand management drought options (consisting of three option types applied across the WRZs), 12 generic demand management options and 5 generic leakage options

Overall, the fdWRMP24 is considered to have significant positive operational effects against SEA objectives to: deliver reliable and resilient water supplies; and maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing. The additional design capacity for potable water that Southern Water would provide would help to ensure a continual supply of clean drinking water, supporting economic/population growth, generating a positive effect on human health and increasing adaptability to the effects of climate change.

The fdWRMP24 (post mitigation) is also considered to have a range of likely significant negative effects on the following SEA objectives:

- Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible);
- Protect and enhance the quality of the water environment and water resources;
- Reduce embodied and operational carbon emissions;
- Conserve, protect and enhance landscape, townscape and seascape character and visual amenity;
- Minimise resource use and waste production.

These effects reflect the number, scale, proposed location and findings of the HRA and WFD assessments, including a precautionary view on the treatment of uncertainty. Many of the options have been revised from the rdWMP24, with delivery delayed in the fdWRMP24 to allow sufficient time for investigation and consideration of additional mitigation options.

The HRA has concluded that for a number of options, adverse effects on integrity cannot be excluded. This reflects the desalination plant options concerning operation in relation to the hypersaline discharge related to the operation of the desalination schemes:

- Isle of Sheppey regarding impacts on the Medway Estuary and Marshes SPA and Ramsar and Thames Estuary and Marshes SPA and Ramsar;
- River Thames desalination regarding impacts on the Thames Estuary and Marshes SPA and Ramsar;
- East Thanet desalination scheme with regards to Outer Thames Estuary SPA and Margate and Long Sands SAC.

The revised earliest implementation date also allows Southern Water to engage with other water companies to review the proposed desalination options on the north Kent coast, with the intention, to be reflected in future WRMP cycles, of a revised, integrated solution, providing substantial yield to the benefit of customers, but appropriately sited to avoid and minimise the range of current identified option and cumulative effects.

The WFD assessment found that the supply options could have effects on water quality affecting the ability of some waterbodies to meet WFD objectives. These issues could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature). Many of the options with potential non-compliance were assessed with low confidence. However, for four options, the WFD assessment concluded the potential for non-compliance with the WFD (with medium confidence).Three of these options involve effluent re-use schemes where the effluent would be discharged to a lake. The other involves a groundwater abstraction. There is limited detail available for these options, and subject to further investigation, it is possible that different conclusions could be drawn with more evidence. Further evidence and assessment is required, and is being progressed through the programme of work to reduce delivery risk as well as programmes to support the Hampshire Water Transfer and Water Recycling Project (HWTWRP) SRO. Given the significant lead in time for some options, it is considered to provide an adequate period with which to conclude such investigations and establish conclusions with which the regulator would concur.

When compared to the assessment of effects the reasonable alternative plan, there are no significant differences between the Southern Water fdWRMP24 and the alternative plans (the Least Cost Plan and the Best Environmental and Societal Plan) in terms of the predicted cumulative effects. The alternative plans do not remove or add any additional significant effects not already identified for the BVP. However, changes in implementation dates could result in some differences as to when effects may occur, which may also have localised effects, but these would not affect the overall cumulative effects predicted for the plans.

9.2 Role of the SEA in developing the WRMP

The SEA, along with the findings of the HRA and WFD assessment, have been used to help inform the development of the fdWRMP24, and enable the consideration of reasonable alternative options for inclusion in the plan and/or alternative phasing of implementing the different options. In summary, the application of these processes has:

- Informed dialogue with the Environment Agency and Natural England as to the options to be included in the fdWRMP24, their effects and potential for modifications.
- Identified a small number of options that have been excluded from the fdWRMP24 due to environmental and other concerns.
- Supported engineering design changes to six schemes to reflect further mitigation opportunities (Isle of Sheppey desalination, River Arun desalination, Thanet Coast desalination, Test Managed Aquifer Recharge, Hardham to Havant Thicket transfer, SES to SNZ transfer).
- Fostered sub-regional discussions and commitments to refinement of the proposed desalination options on the north Kent coast.

9.3 Next steps

The SEA, along with the findings of the HRA and WFD assessment, have been used to help inform the development of the fdWRMP24. In summary, the application of these processes has:

- Informed dialogue with the EA and NE as to the options to be included in the WRSE Emerging Regional Plan and the fdWRMP24.
- Identified a number of HRA and WFD risks.

- Identified a small number of options that have been excluded from the fdWRMP24 due to environmental and other concerns.

Southern Water is submitting the fdWRMP24 and this Environmental Report to the Secretary of State for Environment, Food and Rural Affairs, for a request for publication and once directed to do so, Southern Water will publish the documents for consultation. Following consultation and an analysis of responses and any further work, Southern Water will complete a final dWRMP24. This will be submitted to Government. Following receipt of Government direction, Southern Water will publish the final WRMP24. In conjunction with publishing the final WRMP24, a Post Adoption Statement will also be issued (to meet the requirements of SEA regulation 16 (4)). This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final plan.

9.4 Consideration of environmental effects during plan implementation

Once the WRMP24 has been agreed, the preferred options for managing water supply and demand contained in it will need to be implemented through specific projects. As part of this process, each project may be subject to further assessment to understand and manage its potential environmental and social impacts. These assessments, which may include HRA and EIA, will take account of the issues discussed in this Environmental Report but will also be informed by the greater detail available as the work progresses about construction techniques, building materials, agreed locations and routes.

9.5 Monitoring the effects of the WRMP

Monitoring is required to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures. The SEA Regulations require the responsible authority to:

'monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action.'

Monitoring the significant effects of the WRMP24 can help to answer questions such as:

- Were the SEA predictions of effects accurate?
- Is the WRMP24 contributing to the achievement of the SEA objectives?
- Are mitigation measures performing as well as expected?
- Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?

It is not necessary to monitor everything or monitor an effect indefinitely. Instead monitoring should be focussed on:

- significant effects that may give rise to irreversible damage, with a view to identifying trends before such damage is caused; and
- significant effects where there was uncertainty in the SEA and where monitoring would enable preventative or mitigation measures to be undertaken.

Annex 21 of the fdWRMP24 sets out the monitoring plan for the adaptive planning approach adopted for WRMP24, which will help Southern Water to track and identify the supply-demand adaptive pathway (or 'situation') they are likely to be following into the future, and the options we will need to deliver to maintain the supply-demand balance. Using the WRMP annual review cycle and feeding into the WRSE monitoring of the regional plan, as well as the 5-year water resources management planning cycle, Southern Water can

ensure progress on the adaptive plan is monitored and updated regularly, and action is taken in timely manner to course correct if needed.

As options are brought forward for development, further specific monitoring requirements may be set out in detailed designs and plans accompanying scheme development (including, where applicable, formal applications for any required environmental permits or abstraction licences, planning permission, as well as any scheme-specific HRA and WFD assessments). These will be discussed with relevant regulatory and statutory bodies and stakeholders to agree the appropriate scale and duration of such scheme-specific monitoring activities proportionate to the assessed environmental risks.

Table 9-1 below sets out some proposed monitoring indicators for each of the SEA Topics. In line with the fdWRMP24 monitoring plan, the frequency of review will be aligned with the WRMP planning cycle.

Table 9-1 SEA monitoring indicators for fdWRMP24.

SEA Topic	Monitoring indicators	Source(s) of Information	Timing of Monitoring	Frequency of Monitoring
Biodiversity, flora and fauna	• Number of objections by Natural England on biodiversity grounds for planning applications related to WRMP24 schemes.	Southern Water/ Local Planning Authority	Construction	Annual
	• Condition of European sites and SSSIs.	Natural England	Construction and Operation	Annual (subject to data availability)
Soil	• Area of agricultural land (by grade) lost to WRMP options.	Southern Water	Construction	Annual
Water	• Proportion of surface waters and groundwater waterbodies at 'Good' WFD status	Environment Agency	Construction and Operation	Annual (subject to data availability)
	• Ecological and chemical status of water bodies.	Environment Agency	Construction and Operation	Annual (subject to data availability)
Air	• Changes in air quality as monitored by the Defra Automatic Urban and Rural Network	Defra	Construction and Operation	Annual
	• Scheme-specific monitoring during construction works / during operation (where applicable) would be monitored through an Environmental Management Plan agreed as part of the planning permission process	Southern Water/ Local Planning Authority/ Local Authority Environmental Health Departments	Construction and Operation	Ongoing, as and when available from project level evidence base
Climatic Factors	• Net greenhouse gas emissions per Ml (million litres) of treated water (kg CO2 equivalent emissions per Ml) reported annually by Southern Water	Southern Water	Operation	Annual

SEA Topic	Monitoring indicators	Source(s) of Information	Timing of Monitoring	Frequency of Monitoring
	• Progress against Southern Water Reporting Criteria[72] e.g. Renewable generation		Operation	Annual
Landscape	• Number of objections by Natural England on landscape grounds for planning applications related to WRMP24 schemes.	Southern Water/ Local Planning Authority	Construction	Annual
	• Baseline, construction phase and operational phase Landscape and Visual Impact Assessments or equivalent assessment techniques of sensitive landscapes and visual amenity identified in the SEA (and subsequent planning application submissions) as being at a major or moderate adverse effect. Assessments to be carried out in consultation with appropriate bodies, such as the National Park Planning Authorities, relevant National Landscape management bodies and Natural England. These surveys will aid planning and evaluation of the success of proposed mitigation measures to reduce adverse effects on landscape and visual amenity.	Southern Water/ National Park Authorities/ National Landscape Management Bodies/ Natural England	Construction and Operation	Ongoing, as and when available from project level evidence base
Historic Environment	• Number of objections by Historic England on planning applications for WRMP24 schemes.	Southern Water/ Local Planning Authority	Construction	Annual
	• Change in the number of assets on the Heritage at Risk Register.	Historic England	Construction and Operation	Annual
	• Condition of buried archaeological remains would be monitored during construction works as part of a watching brief and associate response measures as set out in the Environmental Management Plan agreed as part of the planning permission process.	Southern Water	Construction	Ongoing, as and when available from project level evidence base
Population and Human Health	• Complaints logged with Southern Water and Local Authority Environmental Health Officers or equivalent related to WRMP24 schemes.	Southern Water/Local Authority Environmental Health Officers	Construction and Operation	Annual
	• Scheme level community disruption due to construction works / during operation	Southern Water	Construction and Operation	Ongoing, as and when

[72] https://www.southernwater.co.uk/media/4902/reporting_criteria_2020_21.pdf

SEA Topic	Monitoring indicators	Source(s) of Information	Timing of Monitoring	Frequency of Monitoring
	(where applicable) would be monitored through an Environmental Management Plan agreed as part of the planning permission process			available from project level evidence base
Material Assets	• Number of road closures and diversions.	Southern Water	Construction	Annual
	• Number of complaints related to WRMP24 schemes from infrastructure providers and the public.	Southern Water	Construction and Operation	Annual

10 Quality assurance

The Government's Guidance on SEA[73] contains a quality assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in Appendix A Quality Assurance Checklist, demonstrating how this Environmental Report meets the requirements.

[73] Office of the Deputy Prime Minister (2005) *A Practical Guide to the Strategic Environmental Assessment Directive*.

Appendix A Quality Assurance Checklist

Quality Assurance Checklist	
Objectives and Context	
The plan's or programme's purpose and objectives are made clear.	The purpose of the revised draft WRMP is set out in **Section 1** of this report. The objectives of the revised draft WRMP are set out in **Section 1.**
Environmental issues and constraints, including international and EC environmental protection objectives, are considered in developing objectives and targets.	Key environmental, social and economic issues (including protection objectives) identified through a review of relevant plans and programmes (see **Section 2** of this report) and analysis of baseline conditions (see **Section 3**) have informed the development of the assessment framework presented in **Section 4.3**.
Scoping	
Consultation Bodies are consulted in appropriate ways and at appropriate times on the content and scope of the Environmental Report.	The SEA scoping technical note set out the approach to assessing the likely significant environmental effects of the fdWRMP24. It was issued for scoping consultation for 5 weeks from 21st February to 27th March 2022. Responses are summarised in this Environmental Report (see **Appendix B**).
The assessment focuses on significant issues.	Sustainability issues have been identified in the baseline analysis contained in **Appendix G** on a topic-by-topic basis. **Section 3.2** summarises the key issues and opportunities identified.
Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.	**Section 3.3** describes the key limitations and difficulties encountered during the preparation of this Environmental Report.
Reasons are given for eliminating issues from further consideration.	N/a.

Quality Assurance Checklist	
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.	All constrained and preferred options have been assessed, as set out in **Section 5** and **Section 6** of this report. Reasonable alternatives to the fdWRMP24 are identified, described and assessed in **Section 8**.
Alternatives include 'do minimum' and/or 'business as usual' scenarios wherever relevant.	'Do minimum' and/or 'business as usual' are not relevant to this assessment.
The environmental effects (both adverse and beneficial) of each alternative are identified and compared.	This is included in **Section 5** and **Section 6** of this report. Reasonable alternatives to the fdWRMP24 are identified, described and assessed in **Section 8**.
Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained.	No inconsistencies were identified.
Reasons are given for selection or elimination of alternatives.	This information must be provided within the Post Adoption Statement. Further information is also provided in **Section 5.2** and **Section 8**.
Baseline Information	
Relevant aspects of the current state of the environment and their likely evolution without the plan or programme are described.	**Appendix G** and **Section 3** of this report characterises the current environmental baseline conditions, along with how these are likely to change in the future.
Environmental characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the plan area where it is likely to be affected by the plan.	Throughout **Appendix G** and **Section 3.** of this report, reference is made to areas which may be affected by the WRMP24.
Difficulties such as deficiencies in information or methods are explained.	**Section 3.3** details limitations of the data used in the report and assumptions made.
Prediction and Evaluation of Likely Significant Environmental Effects	
Effects identified include the types listed in the Directive (biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material assets, cultural heritage and landscape), as relevant; other likely	This is set out in **Sections 5 and 6** and **Appendix I, J, K and L** of this report.

Quality Assurance Checklist	
environmental effects are also covered, as appropriate.	
Both positive and negative effects are considered, and the duration of effects (short, medium or long-term) is addressed.	This is set out in **Sections 5 and 6** and **Appendix I, J, K and L** of this report.
Likely secondary, cumulative and synergistic effects are identified where practicable.	Likely secondary, cumulative and synergistic effects are considered in **Section 6** of this report.
Inter-relationships between effects are considered where practicable.	This is set out in **Sections 5 and 6** and **Appendix I, J and K** of this report
The prediction and evaluation of effects makes use of relevant accepted standards, regulations, and thresholds.	Relevant standards have been used where appropriate in undertaking the assessment.
Methods used to evaluate the effects are described.	Information on the methods used for evaluation of potential effects is included in **Section 4.**
Mitigation Measures	
Measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the plan or programme are indicated.	This is set out in **Sections 5, 6 and 7** and **Appendix I, J and K** of this report
Issues to be taken into account in project consents are identified.	This is set out in **Sections 5, 6 and 7** and **Appendix I, J and K** of this report
The Environmental Report	
Is clear and concise in its layout and presentation.	We believe the report is clear and concise.
Uses simple, clear language and avoids or explains technical terms.	The report uses accessible language wherever possible.
Uses maps and other illustrations where appropriate.	Maps and illustrations have been utilised in the report.
Explains the methodology used.	The method used is set out in the report in **Section 4.**
Explains who was consulted and what methods of consultation were used.	**Appendix B, C, D and E** of this report outlines the consultation that has been carried out to-date.
Identifies sources of information, including expert judgement and matters of opinion.	Sources of information are included throughout the report.

Quality Assurance Checklist	
Contains a non-technical summary covering the overall approach to the SEA, the objectives of the plan, the main options considered, and any changes to the plan resulting from the SEA.	A Non-Technical Summary has been included as part of the report.
Consultation	
The SEA is consulted on as an integral part of the plan-making process.	The previously issued SEA Scoping Report and early draft Environmental Report were consulted upon and responses to these are included in this Environmental Report (see **Appendix B, C, D and E**).
Consultation Bodies and the public likely to be affected by, or having an interest in, the plan or programme are consulted in ways and at times which give them an early and effective opportunity within appropriate time frames to express their opinions on the draft plan and Environmental Report.	Consultation on the Draft WRMP Environmental Report has been undertaken, with responses summarised in the Statement of Response.
Decision-making and Information on the Decision	
The environmental report and the opinions of those consulted are taken into account in finalising and adopting the plan or programme.	To be included in the Post Adoption Statement, completed when the Final WRMP24 is published.
An explanation is given of how they have been taken into account.	To be included in the Post Adoption Statement, completed when the Final WRMP24 is published.
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered.	To be included in the Post Adoption Statement, completed when the Final WRMP24 is published.
Monitoring Measures	
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA.	The report sets out potential indicators that Southern Water could use in **Section 9**.
Monitoring is used, where appropriate, during implementation of the plan or programme to make good deficiencies in baseline information in the SEA.	The suggestions for monitoring are included in **Section 9** of the report. Monitoring will take place following implementation WRMP.
Monitoring enables unforeseen adverse effects to be identified at an early stage. (These	The suggestions for monitoring made in **Section 9** are for Southern Water to act on,

Quality Assurance Checklist	
effects may include predictions which prove to be incorrect.)	with monitoring taking place following implementation of the WRMP24.
Proposals are made for action in response to significant adverse effects.	Mitigation measures and their rationale are set out in **Section 7** of this report.

Appendix B Scoping Report Consultation Responses

Consultee	Comments	Southern Water Response
Environment Agency 13/04/2022	No comments	Noted
Natural England 15/03/2022	Southern Water should not rely solely on the WRSE SEA scoping (September 2020), as it is uncertain at this stage whether this has been updated to take on board Natural England's previous comments, which concluded that this version was not legislatively compliant.	This Environment Report has been prepared using the WRSE Method Statement: Environmental Assessment (November 2021) which is compliant with SEA Directive. A separate scoping consultation exercise was undertaken specifically for the Southern Water WRMP SEA in February 2022 with Natural England (and other statutory consultees) invited for comment. This scoping stage for the Southern Water SEA consultation was undertaken in accordance with the SEA Regulations. As noted in Environmental Report (Oct 2022) Appendix the WRSE Scoping Report methodology elements were revised taking into account Natural England comments. The scoping process for the Southern Water WRMP SEA was therefore compliant.
	Updated version can be used by the water companies (we would still recommend this is checked by their legal team to ensure they are happy to use it and that there is nothing else to add, in relation to individual WRMPs). Water companies should still inform NE of their approach and/or provide their updated version to NE for review.	This Environment Report contains updated Scoping material from the WRSE SEA and the Environment Report of the Southern Water Drought Plan. The WRSE Method Statement: Environmental Assessment (November 2021) has been used as the methodology for compiling this Environment Report.
	Water companies should consult NE, as a regulator, separate to WRSE, on their	Natural England will be consulted, as a statutory consultee, on all

Consultee	Comments	Southern Water Response
	approach regarding the SEA scoping for their WRMPs. Natural England support Southern Water carrying out their own HRA, WFD, BNG and Natural capital assessments based on the WRSE methodology statements, it is however the company's responsibility to ensure the WRSE methodology statements are legislatively compliant before using.	material produced as part of the assessment of WRMP24.
	Natural England are aware of the potential schemes listed in the letter dated 24 February 2022 and are discussing with relevant parties in Southern Water Services in most cases. We would encourage continued engagement on these schemes as they progress to ensure the best outcomes can be achieved for the environment that meet the necessary legislative requirements. Further discussions are needed on some of these options, as little or no engagement has occurred with Natural England to date.	Southern Water recognise and value the opportunity of ongoing engagement with Natural England (and all statutory consultees). Southern Water recognise that for the options considered, further work is required. This includes engagement and consultations with stakeholders to inform understanding and management of any likely risks, informed by evidence.
	Natural England is pleased demand management remains a crucial component of managing your supply and demand balance in the future and that the target 100 programme will be continued. This is an important step to reduce water usage along with 2050 water leakage commitment.	Noted
Historic England 15/03/2022	We are concerned that the scoping methodology for Southern Water's WRMP24 environmental assessment (including SEA) may inadequately cover the issues that may arise in respect of the potential effects of proposed development sites on heritage assets.	The methodology has been developed through the WRSE plan preparation process which has been subject to a separate consultation exercise.
	This is because we raised concerned about the proposed Water Resources South East Method Statements when consulted on these in August 2020. In particular, we noted on our response that "We could not identify coverage of these matters (i.e. historic environmental or cultural heritage) in any of the other Method Statements; we would request clarification that this is the case and whether it is considered appropriate to cover these matters in these documents."	The methodology used on the Environment Report of the WRMP24 uses the methodology developed for the WRSE Regional Plan. This explicitly includes the Historic Environment as one of the core topics for the assessment of proposals. The assessment of Plans, Policies and Programmes (Appendix E), the Baseline (Appendix F) and

Consultee	Comments	Southern Water Response
		Definitions of Significance (Appendix G) all include matters relating to the Historic Environment in accordance with the requirements of the SEA Directive.

Appendix C Environment Agency comments on June 2022 Environmental Report and Southern Water Responses

Criteria for consideration		Description of how the SEA Environmental Report has met the criteria. Are there any areas of potential non-compliance? Are there areas for improvement?	Southern Water Response
1	Has a Strategic Environmental Assessment been carried out for the draft WRMP?	Yes the draft WRMP was subject to an SEA, documented in the Environmental Report, the focus of this compliance review.	Agreed - no further action required.
2	How has the Environmental Report considered comments made at the SEA scoping stage? Have those in our response been considered fully?	Comments received at the scoping stage have been included in Appendix B of the Environmental Report. Some of the responses made by NE and HE are just 'noted' without a specific response; it is unclear if these comments have been fully resolved. NB. No response received from EA, is this correct?	Specific responses now included to demonstrate resolution of issues.
3	Is an outline of the content and main objectives of the draft WRMP given?	Section 1.4 of the Environmental Report sets out the process that has been followed in the WRMP development, from options appraisal to preferred plan. Very limited information however included in main report on the preferred options in the draft WRMP or its main objective. Information given on WRZ level of different option types considered e.g. catchment level options. Chapter 4 (methodology) refers to the 4 WRMP objectives, and their compatibility with SEA objectives, but a clearer section in the report on the main objectives of WRMP and the time period (and implementation timeframe) of the plan is needed as this is unclear.	The Environment Report at Section 1.4 documents the process of selection of Preferred Options, including a summary of the draft WRMP objectives and timing.

Criteria for consideration		Description of how the SEA Environmental Report has met the criteria. Are there any areas of potential non-compliance? Are there areas for improvement?	Southern Water Response
4	Does the Environmental Report outline an appropriate study area (taking into account pathways of impact and cross boundary effects)? Is the baseline given relevant and does it cover both the current state of the environment (current baseline) and the likely evolution of the baseline in the absence of the plan (future baseline)? How has baseline information been considered and used to influence the development of any objectives? Have aspects such as existing environmental problems and condition of the receptors been considered?	page 28 of the Environmental report outlines that the geographical scope of the SEA are the 14 WRZs and also the river and groundwater catchments that supply these WRZs (which lie outside of the WRZ boundaries). Map provided of study area. Relevant baseline information has been informed from WRSE baseline and updated and is included in Appendix C of the report. Both current and future baseline trends are included where possible. Condition of some receptors have been considered e.g. WFD waterbodies but some receptors e.g. biodiversity lists number of designations, not condition of these and their relation to the WRMP measures. Limitations of baseline is referred to in main report, e.g. COVID 19 pandemic and availability of up to date data.	Agreed - no further action required.
5	Has a plan, policy and programme review been undertaken? How has this review been used to influence the development of the objectives and focus of the SEA?	A PPP review has been undertaken and a summary of relevant plans included in the main report, along with key issues for consideration in the SEA included in the main report too. Appendix C includes further detail on key messages taken from relevant plans and policies and how these have informed the SEA objectives.	Agreed - no further action required.

Criteria for consideration		Description of how the SEA Environmental Report has met the criteria. Are there any areas of potential non-compliance? Are there areas for improvement?	Southern Water Response
6	Has a clear scope for the SEA been given, with justification for scoping in and out topics or effects? Has anything been missed?	Table 3.2 in the Environmental Report sets out the key issues and opportunities scoped in for each topic for the SEA. Section 4.2.1 states that all topics identified in Schedule 2 of the SEA Regulations have been scoped in for assessment.	Agreed - no further action required.
7	Does the Environmental Report set out an appropriate SEA assessment methodology? Are uncertainties/limitations of the assessment identified?	Chapter 4 of the Environmental Report sets out the SEA methodology followed, including SEA objectives and assessment questions relating to these and the SEA assessment framework. Limitations and assumptions are specified. it is noted that the draft WRMP will be issued to government in advance of the completed WRSE work and therefore preferred options can only be considered as 'candidate' at this stage, and adaptive pathway assessment is still to be carried out. The report refers to applying the WRSE assessment for SEA to the WRMP but this is not appended to the Environmental Report to understand its context; it would be useful for this to be appended. A lot of the supporting information comes from the WRSE SEA work, but as explained above, this plan is still in development, so does this provide sufficient information? Has the scope of this been consulted on for example or are changes likely? how will this be addressed in the WRMP, likely that the SEA will need to be revisited? Temporal scale of impacts correlate to the 5 year plan review period, does this assume all measures will be implemented at the start of the plan period? the SEA should cover the full 25 years of the plan (which I understand to the minimum time period for the WRMP?)	The WRSE assessment methodology for SEA, which has been subject to a separate consultation process, is cross-referenced at Section 4.8. The timeframe of the implementation of the WRMP is 25 years.

Criteria for consideration		Description of how the SEA Environmental Report has met the criteria. Are there any areas of potential non-compliance? Are there areas for improvement?	Southern Water Response
8	Has an outline of the reasons for selecting the reasonable alternatives dealt with been given? How has the SEA methodology been used to assess reasonable alternatives? How has the SEA influenced the development of the draft WRMP and the selection of the preferred options?	Chapter 5 and 6 provide an overview of all the options assessed in the SEA. However, it is not clear in the report which ones have been selected as part of the preferred draft WRMP and no explanation/reason as to why other options have been discounted. Note that the plan also is to align with the WRSE regional plan, still in development. It should be noted that the alternatives considered align with the alternatives considered in the regional plan too. Section 9.1 states some high level info on how the SEA has influenced the WRMP development, e.g. highlighting HRA risks and discounting some options but it is not clear from the report which options these were. There is a lack of information in the report on what the draft WRMP contains and therefore how much the SEA has influenced its development and what the reasonable alternatives are to the plan that have been considered. Reasonable alternatives is also a key issue to consider given the HRA risks identified with a number of options (subject to HRA Appropriate Assessment still to be done?). How has the plan addressed this?	Section 4.6 sets out the reasoning behind the selection of preferred options, including the observations of the HRA.

Criteria for consideration		Description of how the SEA Environmental Report has met the criteria. Are there any areas of potential non-compliance? Are there areas for improvement?	Southern Water Response
9	Does the Environmental Report clearly identify the likely significant environmental effects (positive and negative) that will result from the implementation of the actions within the draft WRMP? Have these effects been correctly identified and are there are key ones missing?	Significant effects are summarised in matrices in section 5 of the Environmental Report. Limited information is provided on the options being assessed in the report so it is difficult to analyse the results of the assessment. Detailed matrices for over 300 options is included in Appendix F with more further description of the measures, but as this is over 800 pages long, this is not very accessible for the reader. Major significant effects are identified in tables 5.2 and 5.3 (with more, but still limited, description of the measures). The approach to the assessment aggregates many impacts (both positive and negative) and therefore it is not clear how the major significant impact has been concluded, as one impact can skew the result; an example of this relates to table 5.3 relating to catchment management solutions. These are identified as significant adverse (presumably due to HRA risks identified); however, this does not account of the potential major positive impacts related to river restoration and working with natural processes. A number of the significant positive results included in tables 5.2-5.4 also relate to reliable water supply, the main objective of the options being considered, so does this skew the results further? Table 7.2 (cumulative effects assessment) implies that the HRA Appropriate Assessment has not yet been carried out, so how will this be integrated into the SEA? How has natural capital assessments and BNG assessments influenced the SEA appraisal and results?	The preferred supply options are listed at Appendix H. The full suite of constrained options is set out at Appendix I.
10	Does the Environmental Report set out the potential measures to prevent, reduce and offset significant adverse effects of implementing the draft WRMP?	Mitigation measures are set out in chapter 8 of the environmental Report and are also referred to in chapter 6 of the report, relating to significant environmental effects. Mitigation measures provided are very high level, generic and rely quite heavily on good practice approaches at construction stage. Many of the mitigation measures suggested in Chapter 6 do not appear to have reduced the level of significance of impacts and unclear if suggested mitigation measures have been applied to options in the draft WRMP, e.g. re-routing of	The analysis of mitigation measures (Section 7.2) has been expanded to include analysis of how preferred options have been selected in light of potential reduction/offsetting of the likely impacts of the plan.

Criteria for consideration		Description of how the SEA Environmental Report has met the criteria. Are there any areas of potential non-compliance? Are there areas for improvement?	Southern Water Response
		pipelines to avoid designated sites. Many of the suggested mitigation measures are pushed to the project stage to consider but what commitments have been made at the plan level to reduce/offset impacts of the preferred plan?	
11	How have the findings from the Environmental Report been incorporated into the draft WRMP to reduce environmental impact and/or enhance environmental benefits?	Reference is made in the Environmental Report that SEA findings have fed into the development of the WRMP24, but not clear what specific changes were made as a result and not clear from the report what the draft WRMP contains. Section 9.1 identifies how the SEA and HRA have informed the plan, but high level and no detail of specific changes included. Reference in the report to the Southern Water Biodiversity Action Plan but no information on how the draft WRMP will aid delivery of this? Also lack of info in the report on the timeframe of the plan. HRA risks have been identified with options, how have these been considered in the draft plan?	Section 9 contains further detail of the evolution of the WRMP including the interrelationship with the HRA and the Southern Water Biodiversity Action Plan.
12	Have in-combination and cumulative effects been clearly identified? Are there any key ones missing? How has the Environmental Report considered the interaction between the effects of the draft WRMP and other relevant plans, policies and programmes?	Cumulative effects assessment is covered in chapter 7 of the Environmental Report. This covers cumulative effects within options, with other plans and programmes. The cumulative assessment with WRSE plan is indicative only due to emerging nature of the plan. This assessment refers to several options through their abbreviations so makes it very difficult for the reader to understand the assessment results. Cumulative effects identified for landscape and heritage in table 7.1, how has this influenced the results, assumed in table 7.2 these are not significant? As limited info is included on when measures will be implemented within timeframe of the plan, it is hard to understand how this has been considered within cumulative effects. Other plans are considered but this is high level in nature. Reference is made to SMPs and RBMPs, consideration of FRMPs missing?	Text at Section 6.2 has been revised to reflect the likely significant effects, associated cumulative effects and implementation through the WRMP and taking into account the environmental assessments of the WRSE draft Regional Plan (which is high-level and qualitative in nature).

Criteria for consideration		Description of how the SEA Environmental Report has met the criteria. Are there any areas of potential non-compliance? Are there areas for improvement?	Southern Water Response
13	How will monitoring be undertaken? Is this outlined in the Environmental Report and clear how this will be undertaken?	Monitoring is outlined in section 9 of the Environmental Report. It outlines what monitoring will be completed and who will be responsible for this. A lot of the text relates to work required at project level stage for implementation e.g. EIA, HRA and related surveys. Reference made to Southern Water biodiversity action plan, but not shown links with SEA in this report? A number of the significant adverse effects related to catchment solutions, what monitoring relates to this to see if these effects are likely to happen?	Agreed - additional explanation has been provided in respect of the links between monitoring and existing plans such as the Southern Water Biodiversity Plan.
14	Have next steps/consultation process been fully outlined and is it clear how consultation responses will be taken into account? Are consultation procedures/timeframes appropriate?	Future consultation plans set out in Environmental Report and how changes to the final plan will be communicated. Reference to post adoption statement which will outline how consultation responses will be/have been taken into account. Timeframes for consultation are not however specified.	Additional text included to reflect preparation and implementation of the draft WRMP - recorded in the NTS, Section 1.6 and Section 9.
15	Has a non technical summary been produced and does it cover the relevant aspects of the Environmental Report?	A Non technical summary is provided with the Environmental Report covering the relevant aspects of the Environmental Report.	Agreed - no further action required.

Appendix D Consultation Responses to the October 2022 Environmental Report and Southern Water Responses

D1. Environment Agency

Reference/Issue	Observations		Recommendations	Action Required	Southern Water Response
R4.4 The assessments for the alternative options	Southern Water provided some details on the methodology in Section 4.4.3. for assessing alternatives, however there is no evidence that alternative plans have been assessed. Information on alternative plans have not been included, including their respective effects and justification for discounting them. The development process for the preferred options is described but the reasons for selecting the final shortlist and how the SEA, HRA and WFD have influenced the refinement process is not provided. This lack of transparency could call into question the decision making on any more contentious options.	The lack of detail on the full list of alternatives considered and justification for selection/not being taken forward mean that the SEA does not meet the requirements of the regulations. As a result, this may reduce the effectiveness of the WRMP and pose a risk to the environment. As there is not enough detail on the justification of alternatives, there is the potential for less damaging solutions to have been missed out	Southern Water need to include a summary of the results of the options screening process in section 4.4.3 and the reasons for selecting the preferred options in section 5. Assess the alternative plans and provide narrative on the reasons why the plans were discounted. Include further commentary on how the SEA has influenced the development of the WRMP24, options selected and any mitigation and monitoring requirements.		Section 4.5.4. Reasonable Alternative Plan Assessment of the SEA Environmental Report identifies that the “Given the complexities, the sophistication of the adaptive plan pathways and flexibility of the Preferred Plan, effective environmental assessment of outputs (as reasonable alternatives) has not been undertaken. For the purposes of this SEA, the constrained options have been considered as reasonable alternatives to the preferred options (that comprise the Preferred Plan).” It continues to note that “Southern Water has however, been able to consider the

Reference/Issue	Observations		Recommendations	Action Required	Southern Water Response
	The options screening process has been described but the full unconstrained options list has not been presented alongside the SEA and no commentary has been provided in the report on the outcomes of the screening process or why some options were not taken forward. It also isn't clear how the outcomes of the SEA have influenced the options selection process for the draft WRMP or any mitigation/monitoring requirements. Although some details are provided on mitigation and monitoring in Sections 8 and 9.3, reference is made to further investigations and monitoring being required to determine effects and to define/refine mitigation options and to these being made available at a later date. Whilst it is appreciated that further assessment	and not carried forward which would create greater risk to the environment. This is a potential non-compliance issue and risk of challenge or objection if all relevant information on option selection and the WRMP's response to the SEA findings isn't addressed in the final SEA report and WRMP.			environmental implications of the many different outcomes and possible plan pathways". The assessment of alternatives is therefore considered to be reasonable, proportionate and compliant with the requirements of the SEA regulations. Section 5 presents the findings. This has been revised to reflect further consideration of the reasonable alternatives (taking into account the least cost plan, scenarios and adaptive plan pathways). Section 5.2 outlines how the individual option assessments have been used as part of the detailed option screening process, with reference to the following criteria:

Reference/Issue	Observations		Recommendations	Action Required	Southern Water Response
	work will inevitably need to take place at a project level as part of the planning process, sufficient definition of mitigation and commitment to this should be provided in the SEA to assist the option assessment and consultation processes and provide confidence that any significant adverse effects can be adequately mitigated to ensure risks to the environment are minimised. There is not detailed justification as to why alternatives were or were not taken forward. No commentary has been provided on the outcomes of the screening process. There is no evidence that alternative plans assessed as part of the WRMP development have been assessed.				- Environmental and social assessment - Mutual exclusivities and dependencies - Risks - Phasing - Resilience. Individual SEA option assessments have also been transposed into metric values that have then been used in decision making to inform the selection of the best value plan. Further information is provided on this process in the technical annexes including Annex 23 which contains WRSE option appraisal methodology. A separate annex has been provided summarising the outcome of option appraisal has been completed which provides evidence of

Reference/Issue	Observations	Recommendations	Action Required	Southern Water Response
				how environmental effects identified by either the SEA, HRA or WFD have been taken into account.
R4.5 How SEA have influenced the options selection	Section 9.1. of the Environmental Report states that 'The SEA, along with the findings of the HRA and WFD assessment, have been used to help inform the development of the dWRMP24'. However, the report is lacking in specific details or examples, and neither is any clarification provided within the WRMP itself. Whilst the SEA Environmental Report states that the SEA has shaped the WRMP, there is little detail to evidence exactly how. It is not clear how the outcomes of the SEA have influenced the options selection process for the WRMP.	The purpose of the SEA is to inform the WRMP and if there is no clear examples of how the SEA has influenced the WRMP, then this may lead to increased risk of legal challenge or significant issues being missed in the delivery of the plan. As is evident from Table 7.1, implementation of the plan would result in a number of significant adverse environmental effects. It is not clear whether the opportunities have been taken through the iterative SEA process to fully explore avoiding or reducing these effects further.	The Environmental Report and WRMP should be amended to include clear examples of how the outcomes of the SEA has changed the plan.	Section 5.2 pf the Environmental Report states that: "In moving from constrained options to preferred options, the reasons why options have not been selected includes effects identified through the SEA (and HRA and WFD processes), for example: - Potential effects upon SSSI/SAC from options which could not be addressed by standard mitigation measures or construction best practice (or arise from option operation) with an acknowledgement that any adverse unmitigable effects would increase risk of

Reference/Issue	Observations	Recommendations	Action Required	Southern Water Response
				planning consent not being granted. - Significant and potentially non-compliant effects on water quality from option operation during period of low flows. - Option uncertainties arising from insufficient progress on option definition resulting in potential, environmental effects." This section, along with the summary information in Section 9 has been revised to reflect the provision of additional detail as appropriate.
I2.1 Clear scope for the SEA	Section 4.2.1. states that all of the topics required under the SEA Regulations will be scoped in, however, no justification has been given for this decision other than referencing the requirements of the SEA Regulations. There is also little explanation as to how the scoping consultation influenced the scope of the SEA. The Environmental Report does not explicitly	Failure to fully identify all likely significant environmental effects of the plan, which would undermine the adequacy of the SEA Environmental Report, pose a potential risk to the environment if effects	The SEA assessment timescales should be changed to match that of the WRMP, and the assessment should consider the new temporal scope. Section 4.2. of the Environmental Report	The scope of the SEA includes all topics identified by the SEA regulations (Schedule 2(6)) to ensure all likely significant effects have been identified, described and evaluated. The approach provides a

Reference/Issue	Observations	Recommendations	Action Required	Southern Water Response
	indicate the temporal scope of the SEA, and therefore we cannot be confident that the full timeframe of the plan spanning 50 years has been assessed. The table in Section 5.3. presents the assessment findings for each of the Preferred Supply Options, however, there is no indication to the timeframe for each of the effects.	are not fully understood and make the adoption of the WRMP vulnerable to legal challenge. The absence of justification for scoping in topics and absence of timescales when assessing the effects may lead to lack of understanding. If the temporal scope of the SEA and WRMP do not match, this may mean that not all effects of the plan have been assessed. As a result, this may reduce the effectiveness of the plan and pose a major risk to the environment. This is a highly significant compliance issue. The issues surrounding the absence of justification for	should provide further justification/commentary for the scoping in of all the topics from the assessment.	comprehensive and inclusive approach to considering the effects of proposed options, aligned with WRSE requirements and consistent with government, regulator and sector guidance. The revised SEA Environmental Report includes further consideration of consultation responses received. A separate scoping consultation exercise was undertaken specifically for the Southern Water WRMP SEA in February 2022 with Natural England (and other statutory consultees) invited for comment. This scoping stage for the Southern Water SEA consultation was undertaken in accordance with the SEA Regulations. The scoping consultation document stated that, where

Reference/Issue	Observations	Recommendations	Action Required	Southern Water Response
		scoping in topics and the timescales for effects are not a matter of compliance.		relevant, the contextual information (including the review of plans and programmes and baseline information) will be revised to supplement the information already collated and presented for WRSE. This has been outlined in the SEA Environmental Report. Additionally, no changes were proposed to the approach to assessment. Appendix B sets out the scoping report consultation responses and how the scoping information was amended to take the responses into account (the EA were noted as not responding). Section 4.2 notes that all topics in the SEA regulations have been scoped in. This reflects the wide ranging nature of the plan and baseline evidence and key issues identified.

Reference/Issue	Observations	Recommendations	Action Required	Southern Water Response
				With regard to timescales, Section 4.2 outlines that effects are assessed in short, medium and long term. In the detailed assessments reference is made to whether such effects are likely to be temporary or permanent. The SEA also sets out that the assessment considers both the construction and operational phase effects for each option assessed. The SEA is therefore linked to the expected delivery of the WRMP, based on the level of detail available to the strategic assessment. Section 5.3 to 5.7 outlines the effects likely in the construction phase and operational phase of the options so does implicitly the timeframe of when the effects are likely. There is further detail in the detailed appendix with assessments.

Reference/Issue	Observations		Recommendations	Action Required	Southern Water Response
					Appendix B, C and D of the Environmental Report detail the consultation responses and how they have been taken into account within the completion of the SEA and the presentation of its findings in the Environmental Report. Section 4 of the Environmental Report presents the information on the temporal scope of the SEA. It provides a temporal definition of the 'short,' 'medium' or 'long-term' effects required in order to meet the requirements of Schedule 2(6) of the SEA Regulations. This is then reflected within the individual option assessments and the consideration of construction and operational effects."
I2.2.	Mitigation and monitoring have been addressed in the	The Environmental Report does not	A summary of the key mitigation measures identified in sections 5, 6 and 7 and further		Section 5 of the Environmental Report

Reference/Issue	Observations		Recommendations	Action Required	Southern Water Response
Potential measures to prevent, reduce and offset significant adverse effects (Lack enough mitigation and monitoring)	assessment however it is inconsistent and lacking focus or commitment in some areas. In the Section 5 assessments, mitigation has not been identified for all options resulting in significant effects. Mitigation measures to be taken forward as part of the option development and planning process to help avoid or address significant adverse effects have not been specified in Section 8. Significant residual effects remain in some cases without any further actions offered other than further investigation or monitoring. e.g. Lower Itchen Drought Order. No other mitigation measures are proposed other than monitoring for significant negative effects from some proposed water resource management option e.g. predicted	commit to reducing significant negative effects in all cases and does not demonstrate the extent to which the proposed mitigation measures will reduce any significant environmental effects. Without commitment to avoiding or addressing potential negative effects, or an understanding of the effectiveness of any mitigation measures in reducing effects there is the potential for implementation of the plan to give rise to significant adverse effects. This may lead to challenges about	project specific measures required to address significant effects identified by the assessment should be included in section 8. This should cover a broader range of measures than just construction and monitoring. The assessments should also include consideration of the impacts of mitigation and highlight any significant residual environmental effects that would be expected, if any, after the proposed mitigation is applied.		presents the findings of the individual option assessments for the constrained and preferred options (summarised from Appendices I, J and K). Effects are considered during construction and operation and pre- and post-mitigation. These have then been summarised in Section 8 of the Environmental Report. This includes a full suite of construction mitigation measures and specific measures concerning biodiversity, scheme design, pollution prevention, air quality, population and human health, climate change, resource use, cultural heritage and landscape. They are considered to go significantly beyond monitoring measures. The individual option assessments present the post-mitigation

Reference/Issue	Observations		Recommendations	Action Required	Southern Water Response
	negative effects on European designated waterbodies. Opportunities for environmental enhancements or benefits at a project or operational level have not been identified. Limitations of the biodiversity mitigation has been recognised. Mitigation for pollution prevention is proposed, however, the report signposts best practice guidance rather than outlining a plan for more detailed work at the project level. There is no explanation to the extent of significant environmental effects after mitigation is applied and therefore the effectiveness of the mitigation measures to prevent, reduce and offset significant adverse effects cannot be determined. Section 8 does not determine the extent to which significant residual environmental effects	the adequacy of the SEA and significant legal challenge or compliance risks.			effects, and in some instances indicate the potential for residual moderate or likely significant effects. The Lower Itchen Drought Order option assessment includes reference to more extensive mitigation against the biodiversity topic e.g. "A Lower Itchen Drought Order Mitigation Package has been prepared consisting of a package of in-river restoration and mitigation measures for the Itchen, including a programme of measures aimed at increasing the resilience of the Itchen valley Southern damselfly population, and catchment-wide work, aimed at addressing wider catchment pressures so as to increase resilience to synergistic

Reference/Issue	Observations		Recommendations	Action Required	Southern Water Response
	remain if the plan were to be implemented.				and compounding effects. The Environmental Report for the fdWRMP24 has been amended to reflect any additional suitable mitigation measures which have then been included within the individual option assessments and summarised in Sections 5, 6 and 7.
I2.3 In-combination and cumulative effects	Both inter and intra project effects have been identified for the options. however, the analysis is very high level. Potential cumulative effects with the Regional Plan are clearly identified, for other cases, the Environmental Report either concludes that cumulative effects would be unlikely (with limited reasoned justification) or acknowledges that it is not possible to be more definitive at this stage. The methodologies for the assessments haven't been	Whilst efforts have been made to consider cumulative effects, the assessment of inter-project effects is limited, and the requirements of the regulations not fully met. Risk of challenge to the adoption of the WRMP if the SEA has failed to provide the information reasonably	Further explanation of the assessment methodology in Section 7 and an overview of the potential cumulative effects and proposed mitigation on a topic-by-topic basis. Efforts should be made to clearly identify and evaluate inter-cumulative effects, even if qualified by reasoned assumptions. We would expect an overview of the potential effects on a topic-by-topic basis including further details on the source of effects.		Section 4.4.2 sets out the approach to the assessment of secondary, cumulative and synergistic effects (consistent with Schedule 2 (6)) of the SEA regulations. Section 6 of the Environmental Report presents the findings of the assessment of cumulative effects (including secondary and synergistic effects) taking into accounts for both intra and inter

Reference/Issue	Observations		Recommendations	Action Required	Southern Water Response
	clearly defined and not all significant residual effects from the options assessments in sections 5 and 6 have been identified in the cumulative effects assessment or the results from the HRA or WFD assessments. An overview of the potential effects on a topic by topic basis would have been more helpful including further details on the source of effects. Limited detail as to how cumulative effects with other relevant plans, programmes and projects have been assessed and limited justification to support the conclusions that cumulative effects are unlikely.	required and to identify, describe and evaluate likely significant environmental effects, including cumulative effects.			plan and programme. In-combination effects with identified NSIPs are also considered. The cumulative effects arising from the WRMP24 are presented for both construction and operation and pre- and post-mitigation against all the SEA topics. Section 6 of the Environmental Report has been revised to take into account the need to summarise the inter-plan effects by SEA topics, noting that this remains a strategic level assessment, with a commensurate level of detail and justification provided. "
I2.4 How will monitoring be undertaken	SEA monitoring indicators for the WRMP are outlined in Table 9-1. The table describes what the monitoring indicator is, what the impacted receptor is and where the information will be sourced from, however there is no indication about when the monitoring will take place and		Whilst some information on monitoring is provided, the Environmental Report fails to provide detail	Table 9-1 should be amended to include further details about when the measures will be carried out, by who and how.	SEA regulation 17 requires: "(1) The responsible authority shall monitor the significant environmental effects

Reference/Issue	Observations	Recommendations	Action Required	Southern Water Response
	how. There is no information on trigger points and what action will be taken if unexpected significant effects are found during monitoring. The proposed monitoring does not clearly describe when the measures will be carried out, who by and how. There are no thresholds defined for remedial action in the event of unforeseen adverse effects arising. Monitoring of benefits delivered by the plan e.g. BNG or natural capital has not been addressed. There is no plan for what will happen if unexpected significant effects are found during monitoring.	on all of the matters in Regulation 17, most notably about making provision for remedial action in the event of unforeseen circumstances. Risk of challenge/objection on SEA regulations compliance grounds and failure to give sufficient weight to the arrangements for monitoring, may result in unforeseen adverse effects continuing without appropriate remedial action.	Further consideration should be given to measuring other objectives of the plan such as delivering biodiversity net gain and improvements in ecosystem services. In particular, the Environmental Report should set out all of the information required by the regulations, including how any unforeseen adverse effects will be remedied, using specific and measurable indicators. Information should be provided about what actions should be taken if unexpected significant effects are found during monitoring.	of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action. (2) The responsible authority's monitoring arrangements may comprise or include arrangements established otherwise than for the express purpose of complying with paragraph (1)"". Section 9 of the Environmental Report reflects these requirements and notably takes into account the allowance of part (2) to ensure the monitoring measures proposed do not duplicate existing commitments. In consequence, the frequency of data collection is linked to

Reference/Issue	Observations	Recommendations	Action Required	Southern Water Response
				existing monitoring programmes, with the data sources also reflective of the responsible body. Section 9 of the SEA Environmental Report complies with the requirements setting out the scope of the monitoring arrangements. It details the indicator. These are to be confirmed in the Post Adoption Statement. Section 9 of the SEA Environmental Report recognises that further development of options is necessary to help develop more detailed monitoring arrangement. As options are brought forward for development, further specific monitoring requirements may be set out in detailed designs and plans accompanying scheme development (including, where

Reference/Issue	Observations	Recommendations	Action Required	Southern Water Response
				applicable, formal applications for any required environmental permits or abstraction licences, planning permission, as well as any scheme-specific HRA and WFD assessments) The monitoring section (Section 9) has been revised to reference the potential positive effects associated with biodiversity net gain and improvements in ecosystem services. Unforeseen adverse effects are by definition difficult to anticipate and in revising the section, such measures as proposed emphasise the importance of process, data sources and evidence thresholds as a precursor to any further actions.

D2. Natural England

Reference	Comment	Southern Water Response
Summary	For supply options proposed earlier in the WRMP timeline, full environmental assessment must be included and/ or completed within this dWRMP, this is a concern as many of these options have the potential for significant impact to designated sites.	NE has, following further separate engagement, provided supplementary advice on the term 'full environmental assessment' and its application to the WRMP and specifically water resource options to be implemented before 2035. It was agreed that the term was intended to cover the full range of environmental assessments being undertaken of Southern Water WRMP24 e.g. SEA, HRA, WFD, BNG and NCA rather than reflecting updates expected to one specific assessment (such as the HRA, or a new assessment) as well as those existing investigations covered by the WINEP. Annex 9 'Protecting and Enhancing the Environment' has been updated to include information from existing or planned investigations to address the removal of known or potential adverse effects.
Summary	The HRA and SEA must have a more detailed in-combination assessment for the options in the dWRMP. In Natural England's view it is unclear how options have been deemed not to have an in-combination/ cumulative impact by the company and the Water Resources South East (WRSE) regional plan.	The revised HRA and SEA assessments of the revised dWRMP have been refined to address the comment for further detail on the in combination assessment of effects. When undertaking the amendments, due regard has been given to the consideration of effects with other water company proposals (where published) and WRSE Reginal Plan expectations.
Summary	There is insufficient detail and evidence within (and in some cases inconsistencies between) the SEA and the appendices, for example to exclude likely significant effect and/or adverse effects on designated sites, MCZs, protected landscapes and/or habitats	The Environmental Report of the fdWRMP24 has been amended to ensure the consistent treatment of designated conservation and landscape sites and features within the SEA of the revised preferred options. This includes SSSIs, SSSI

Reference	Comment	Southern Water Response
	and species of principal importance for the conservation of biodiversity. These potential impacts on important environmental receptors have not all been adequately assessed and where applicable, sufficiently mitigated.	risk zones, MCZs, NNRs, Ancient Woodlands, National parks and AONBs, and supplements the range of features already considered when identifying, describing and evaluating the likely significant effects of the WRMP24.
NE2	Natural England acknowledges the work on the Arun Valley Habitats sites and the River Itchen SAC (Totford) is ongoing, in that there is: • The WINEP investigation currently being undertaken on the Candover stream (River Itchen SAC) for the Totford source which will inform future options to avoid the adverse effect. Southern Water has an ambition to take this source offline by 2030. It is noted through discussions with the company that this has been considered in the supply demand balance but this is not clear in the HRA or wider information in this draft plan. • Southern Water's sustainability investigation; Hardham Basin Environmental Study (HBES) is currently being undertaken on the Arun Valley Habitats sites which will be completed in 2025. The outcome of this investigation will inform which of the alternative options are required to avoid the adverse effect. Whilst there have been discussions outside of this plan regarding licence changes and alternative solutions, there is considerable uncertainty on deliverability particularly to the necessary timelines. This has not been clarified in the HRA, or wider information in this draft plan.	The strategy regarding Totford (Alresford) source and the Itchen SAC was set out in our Environmental Ambition (Annex 9). As above, and consistent with the emerging outcome of the WINEP we are assuming that this source will cease to operate and its licence be revoked from 2030 under all our Environmental Destination Scenarios and hence is it explicitly represented in our Adaptive Plan. See above comment for Pulborough
NE3	The following is not demonstrated in the appropriate sections of the HRA, which must be updated within this dWRMP: • An assessment of the effect of the increase in demand for abstraction that is likely to arise Page 5 of 41 from growth, including new development. In relation to the Arun Valley designated sites this must also consider the company's	The WRMP supply-demand balance modelling takes account of predicted local and regional growth when identifying risk areas and potential solutions, based (inter alia) on Local Plans and population growth models. 'In combination' effects on water resources with respect to land-use plans and specific options are therefore inherently considered and accounted for as part of the WRMP option development process (i.e. an

Reference	Comment	Southern Water Response
	obligations under Water Neutrality4 within the Sussex North Water Resource Zone (WRZ). • A description of the options, which could include water efficiency in new and existing development, to enable reduction of recent actual abstraction, as far as this is possible, so that the existing adverse effects are minimised or potentially removed before long-term additional supply provision. As detailed above, in relation to the Arun Valley Habitats sites this should reflect how Southern Water is achieving both the required targets outstanding from their previous WRMP 2019 and their obligations under Water Neutrality. • An assessment of how far options for water efficiency or other measures can be implemented to remove the adverse effect in time to meet the objectives for nature recovery in the Environment Act and 25 Year Environment Plan, set out in Annex 2. This should take account of the obligations for species abundance from the Environment Act (also set out in Annex 2). Water companies should check and work towards targets in place under the Government's Environmental Improvement Plan, now published under the Environment Act 2021. • An explanation of the measures that will be put in place to compensate for existing adverse effects, if there are no alternatives to continuing recent actual abstractions and adverse effects cannot be removed or mitigated (only applicable to the River Itchen SAC with Totford abstraction).	option that does not account for local growth is not a solution) and this has been relied on by the HRA. Demand side options including water efficiency have been identified, described and considered in the HRA of the fdWRMP24. Further information, reflecting revisions to proposed options has been used to update the HRA appropriate assessment, supported by suitable cross referencing to the revised Appendix 9 'Protecting and Enhancing the Environment'.
NE4	Some examples of what could be explored with the above assessments are: a. providing support for water efficient new build local plan policies for both household and non-household in the WRMP, which should include sufficient company resource to support planning authorities and developers to seek the tightest	See above comment for NE3.

Reference	Comment	Southern Water Response
	achievable water efficiency measures. Consideration should be given to measures such as greywater recycling and rainwater harvesting in new builds as well as efficient fixtures and fittings; b. Including provision for the water company to offset any increase in the relevant abstraction from the new development by mechanisms to reduce existing water consumption in the relevant area, thereby preventing an increase in the existing adverse effect; c. In some cases, compensation may be required in addition to a) and b) for the existing adverse effect.	
NE5	The HRA must include all options required to address current and/or potential water deficits that the company may have that impact designated sites. The HRA must include assessment of existing supply options, such as current licensed abstractions, where there has now been a material change (since the last HRA of that licence and / or the last dWRMP) but essentially those that are currently undergoing investigation to understand with certainty whether there are adverse effects to particular designated sites. This includes but is not limited to WINEP investigations on the North Kent Marshes (Medway Estuary Habitats sites, The Swale Habitats Sites and Thames Estuary and Marshes Habitats sites), the River Itchen SAC, and other water resource focused investigations such as in the Arun Valley (and the subsequent Habitats sites in this catchment as mentioned above). These options must be appropriately assessed in the HRA but also throughout the WRMP including the SEA. Many of the options which Natural England would expect to see included, are outlined in table 3.1 of Annex 9 (page 17), however these should be incorporated into the HRA and main document of the WRMP where appropriate.	"For existing abstraction licences and their consideration in WRMPs, these requirements are met through the licence review arrangements and protocols that are implemented at the start of each WRMP cycle, which also take account of the Environment Agency's Water Industry National Environment Programme (WINEP). This review process (and WINEP) is undertaken in conjunction with Natural England, which identifies protected sites (including European sites) to the EA where it believes abstraction-related issues are affecting the achievement of favourable conservation status. This review is important to the development of the supply forecast at the start of the WRMP process and is consequently reflected in Section 5.4 ('Developing Your Supply Forecast') of the Water Resource Planning Guideline (2020 draft and 2023 published versions) which outlines the requirements for sustainable abstraction taking into account existing statutory requirements and environmental destination. Any required licence amendments are factored into the supply-deficit calculations, and the EA will have confirmed that those licences that are considered valid for the planning period when the WRMP modelling is undertaken.

Reference	Comment	Southern Water Response
		The supply forecast informs the supply-demand balance calculations for the planning period, which is in effect the 'predicted future baseline' for water resources in a supply area. The water company then develops 'options' for resolving any predicted deficits in the supply-demand balance, which are then tested against various metrics to determine the 'preferred plan'. Consideration of the existing consenting regime in relation to European sites is noted in the WRPG (2020 draft and 2023 published versions) solely in relation to the development of the supply forecast (Section 5.4), and not in those sections of the guidance that explicitly consider the application of HRA to the WRMP; and whilst the 2023 guidelines refer to "Your plan, including any options within it…" in relation to the Habitats Regulations, all references to HRA (as both a process and legislative test) are explicitly and/or implicitly linked to the options* identified by the WRMP. Consequently, the WRMP HRA addresses Regulation 63 of the Habitats Regulations and necessarily focuses on the assessment of the additional effects that the WRMP introduces over the predicted future baseline (i.e. the supply forecast determined at the start of the WRMP process that takes account of the agreed sustainability reductions and any that are reasonably anticipated). Therefore, the HRA of the WRMP is necessarily a forward looking assessment of the specific options (feasible and preferred) proposed by the WRMP to resolve deficits; it does not (and cannot) re-litigate the existing licences agreed for the planning period (and hence the WRMP supply-demand baseline) since there has to be a starting point / basis for the WRMP (i.e. the modelling / optioneering process cannot start with the assumption that no current consents are reliable; and the HRA of the WRMP does not and cannot determine the

Reference	Comment	Southern Water Response
		licensing baseline from which the supply-demand balance is calculated). *Note that all references to WRMP 'options' in the WRPG are made in the commonly-accepted sense, i.e. explicit interventions proposed by the WRMP to increase water supply or reduce consumption (e.g. Section 1.1), not a broad 'catch all' for ongoing water company operations such as those existing abstractions that will form part of the 'predicted future baseline'"
NE6	The time-limited licences outlined in section 3.3, the investigations in table 3.4 and section 3.5 of Annex 9 (in terms of the confirmed licence changes required). These changes must be reflected in the in the HRA (and SEA) assessment, to ensure deployable output (DO) can be maintained should it not be possible to renew those licences or subsequent investigations show licence changes are needed (as alluded to in this section) by the company. Alternative supply options must be identified where investigations are in progress in case this results in certainty of an adverse effect on integrity.	Annex 9 'Protecting and Enhancing the Environment' has been updated to include information from existing or planned investigations to address the removal of known or potential adverse effects.
NE7	Details in Annex 9 in relation to the issue raised in the last two paragraphs are inconsistent and confusing and requires clarification. For example, there appears to be two tables both captioned as table 3.1 (on page 21), the information in these tables outlines the projected impacts of licence capping on DO, however, those options to address deficit need to be clearly assessed in the HRA and main document of the WRMP	Annex 9 'Protecting and Enhancing the Environment' has been updated to include information from existing or planned investigations to address the removal of known or potential adverse effects.
NE8	Southern Water must ensure that all options within its WRMP have been assessed fully within the HRA. For a number of options, Natural England considers that insufficient evidence has	The revised HRA of the revised dWRMP has considered the effects of the revised preferred option suite (both individually, and where appropriate in combination). The assessment has

Reference	Comment	Southern Water Response
	been provided to rule out an adverse effect on integrity with sufficient certainty, or the HRA acknowledges that there is insufficient evidence at this stage. Where an option cannot rule out an adverse effect on integrity, alternative options should be presented which can satisfy the supply-demand deficit if these options are not feasible. For options that are planned for earlier in the timeline (prior to 2035, based on legislative targets in Annex 2) these must be assessed in this dWRMP. This should be clearly demonstrated in the HRA. Natural England acknowledges that some uncertainties for options beyond 2035 cannot be addressed fully for all options at this stage. It is expected Southern Water resolve these uncertainties well in advance of the proposed delivery timeline. Natural England advise that this is reflected in the environmental assessments and preferably includes a timeline of how this will be achieved as soon as practicably possible. Please refer to Annex 2 for further details of what is expected for a “down the line assessment”	been amended to address the additional request for details of options implemented before 2035, and draws on as appropriate, information from the revised Appendix 9 'Protecting and Enhancing the Environment'. Options to be implemented after 2035, where uncertainties remain, will be subject to further review and refinement (if they are to be retained) in future planning cycles.
NE9	In relation to the above issue, Natural England has found it difficult to review options and determine whether assessment has been completed appropriately both at the screening and appropriate assessment stages. For example: • The list of options screened into the HRA seem to differ from those in the technical report. In some cases, these could be the same options, but different DO volumes are referred to. For example, in the technical report (Table 7.3 page 152 and 153) the Hastings water recycling option is referred to as a 15Ml/d option, but the option screened in the HRA is 9.5Ml/d. It is also unclear if this is the same option as the option name is different. This option also appears in the SEA as 10Ml/d and not 9.5Ml/d. No other options involving Hastings were screened in the HRA	The revised HRA, WFD and SEA assessments of the revised dWRMP have been refined to address the request for consistency.

Reference	Comment	Southern Water Response
NE10-1	"Different names are also used for several options. For example, in the technical report (for example Table 7.3) a recycling option in the central area is referred to as Recycling (SNZ):	These inconsistencies relate to our SEMD naming of both existing sources and new supply options. We will ensure that all sources and options are consistently referred to by their SEMD name in our revised draft plan.
NE10-2	The list of sites which appear in the stage 1 screening and then at stage 2 are different, e.g., Culham (Thames to Southern Transfer) does not appear in the stage 1 screening table (despite it stating this is necessary in table 0.2 on page 133), but then does appear in the stage 2 summary table on page 144. The list of sites should be checked to ensure they match and are all assessed where appropriate.	Comment noted. The revised HRA of the revised dWRMP have been refined to address the request for consistency.
NE10-3	It is understood why some options which have been screened out at stage 1 are only presented in the full screening in Appendix D but for clarity and transparency all options screened should be presented in the main HRA report.	We have reviewed this request further; however, given that the HRA applies to the plan as presented, and focuses on the effects of the (revised) preferred options, the additional value of including the detail of the options to be screened out in the main body of the HRA report, as opposed to leaving them included in a separate and referenced has been considered, and on balance has not been actioned as it does not improve the transparency or clarity of the revised HRA Report.
NE10-4	There seems to be no logical order for the options screened in the HRA stage 1 screening, the screening should be split into the three supply areas to make it easier to follow	The revised HRA of the revised dWRMP has been refined to address this comment.
NE10-5	A consistent approach should be taken with regards to screening of the drought options. It is unclear why some have been screened, whilst others have not e.g., the Candover augmentation drought order has been screened but it appears that the Lower Itchen drought order has not. Another example in relation to drought orders, is that it is unclear how the Candover drought	The revised HRA of the revised dWRMP has been refined to address this comment, consistent with the most recent information from the Drought Plan assessments.

Reference	Comment	Southern Water Response
	order has been deemed to have no adverse effect on integrity of the River Itchen SAC. This option had been progressed to the Imperative reasons of overriding public interest (IROPI) and compensatory habitat stages in the drought plan HRA due to impacts to the River Itchen SAC. This needs to be acknowledged in the HRA. Drought options must be included and assessed appropriately	
NE10-6	"It is unclear why the following options have been grouped together on page 144 of the HRA, and why the 'European sites screened-in' column for these sites is blank: ▪ HWZ to Otterbourne (120) Potable - Construction ▪ HWZ to Otterbourne (50) Potable - Construction ▪ Culham (120) - potable - Construction ▪ Culham (50) - potable - Construction.	See HRA - these are all essentially components of the same scheme. The revised HRA of the revised dWRMP has been refined to address this comment
NE10-7	In the Appendix D screening documents, some of the screening tables for the Recharge of Havant Thicket reservoir from Budds Farm option are blank (page 40, 41 and 42), this should be updated to include the full details. The same applies for the Gravesend recommissioning option on page 92 of Appendix D.	The revised HRA of the revised dWRMP has been refined to address this comment.
NE10-8	Limited details have been provided in the main HRA document for the Gravesend source as it has been screened out at stage 1 (Appendix D, page 92). Please can further details be provided on where this option is located, as sites near Pevensey have been screened in the HRA, but the name would suggest a site in Kent. Further clarity is needed and the HRA should be updated accordingly if necessary.	The revised HRA of the revised dWRMP has been refined to address this comment.

Reference	Comment	Southern Water Response
NE10-9	The following scheme: Import: SEW Kingston to KTZ Near Canterbury (2Ml/d) appears to be screened twice in Appendix D. Please note this is screened under the alternative name for this option each time as referred to above. The naming of this option and the conclusions drawn in the HRA must match those in South East Water's WRMP. The same applies for the option SEW - SW - SEW RZ5 to Pulborough.	The revised HRA of the revised dWRMP has been refined to address this comment.
NE10-10	Groundwater: Romsey - new BHs (4.8Ml/d) option. Operational phase for Romsey: new BH option and the conclusions drawn around Emer Bog SAC. It has been assumed that this site will not be impacted, but investigations will be needed to determine if this is the case. Note that the reference supporting this (Allen 2017) also does not appear in the reference list of the HRA.	The comment is noted. It was agreed in engagement with NE, that reference to further investigations would be to future works undertaken outside the process of completion of the fdWRMP24 and where necessary would be considered in either future WINEP programmes or future planning cycles
NE14 - Critical amendments required to the HRA	Catchment measures are not currently assessed in the HRA (more details on this issue are covered in section 1.2.3 of this letter), Natural England advises that they should be included. Catchment schemes are likely to have overall positive effects on biodiversity, but there is potential for them to impact Habitats sites if they affect natural processes (e.g., flooding, flows or habitat functioning) on which the sites' interest features depend. It is important to understand the risks and the potential for in-combination impacts with other options.	We have excluded catchment schemes from our revised draft plan. The benefit is now included in baseline.
NE17 - Additional comments	Natural England is pleased to see the HRA is in a clearly identifiable document, with a clear section layout. The HRA appropriate assessments have had regard to the relevant sites' conservation objectives and supplementary advice to the conservation objectives (SACOs). However, Natural England is highlighting the following as examples of where editing and presentation has made the review of the dWRMP challenging:	The revised HRA of the revised dWRMP have been refined to address this comment

Reference	Comment	Southern Water Response
	• The HRA is often lacking references to support the conclusions, for example the Newbury groundwater option.	
NE19	Natural England have concerns about the SEA screening and conclusions which are highlighted below: • The list of options screened in the SEA and HRA appear to be different with more options screened in the SEA, this makes it hard to determine if the conclusions between documents are consistent and the impacts fully considered. Where there are impacts on high value receptors, such as protected sites, species, and habitats, this should be considered major adverse impact within the assessment. • Please also ensure the naming of options is the same between the SEA and HRA. For example, in table NTS5 (page 17) of the SEA it refers to options as codes, whereas the HRA has both. Having both or just the option name makes it easier to follow which option is being referred to. This is also the case in other places such as Appendix E where the names appear to be different for some options compared to the HRA and technical report. Natural England advise this is checked and updated accordingly to ensure the names are consistent throughout the dWRMP. Some of the options have different DO outputs in different documents for example, the Hastings WTW (to augment storage in Darwell reservoir) appears in the SEA as 10Ml/d option and in the HRA as a 9.5Ml/d option, this should be updated accordingly throughout the WRMP. • In Natural England's opinion the negative impacts on biodiversity have been underestimated for many schemes, with most schemes being ranked as a minor negative impact. Schemes such as the desalination plants and water recycling options in some cases could have a significant negative effect, the rankings for these schemes should be reviewed. Natural England gave detailed advice on the West Southampton Coast Desalination	The revised HRA, WFD and SEA assessments of the revised dWRMP have been refined to address the request for consistency (between the assessments and with the revised dWRMP24). The Environmental Report of the fdWRMP24 has been amended to ensure the consistent treatment of designated conservation and landscape sites and features within the SEA of the revised preferred options. This includes SSSIs, SSSI risk zones, MCZs, NNRs, Ancient Woodlands, National Parks and AONBs, and supplements the range of features already considered when identifying, describing and evaluating the likely significant effects of the WRMP24. This has informed revisions to the pre- and post-mitigation assessment of likely significant effects against the biodiversity topic, which is then reflected in Sections 5, 6 and 7 of the revised Environmental Report. The revised SEA has included amendments to Section 4.5 Limitations of the Assessment, as appropriate. The reference to 'brine' has been clarified in further discussion with NE and has been confirmed that the term should only apply to effluent discharges of the desalination options and not the water recycling options.

Reference	Comment	Southern Water Response
	option at WRMP19 and subsequent RAPID gates, the assessments must be in line with that advice. Further details on this issue have been provided in section 1.4.2 Options taken forward in dWRMP of this letter. • Section 4.5 of the SEA outlines the limitations of the assessment, whilst it is noted studies have been undertaken on the dispersal of plumes from desalination plants, many of the studies have not been undertaken in British conditions and assessments will be needed on a case-by-case basis. A caveat highlighting the regions and different conditions these studies were undertaken in should be added. • In section 4.5, in regard to water recycling options, it is not evident that brine discharges from this process have been fully considered, and if so, the potential environmental impacts of these discharges and measures required to avoid/mitigate impacts such which will be different depending on aspects such as discharge location. It cannot be assumed that the treatment process will remove this if for example it is transferred back through a Wastewater Treatment Works (WwTWs). • Section 6.2, table 6.1 outlines the significant effects outlined by the SEA topic. It is unclear why only three options are deemed to have a significant negative impact on biodiversity, Natural England would not agree with this conclusion. The assessments for all options should be reviewed and updated, taking account of the information Natural England has provided to the relevant project teams on options in the WRMP19 plan. Only one landscape option is deemed to have a significant negative impact, this should also be reviewed for both construction and operation impacts. • Some of the desalination plants do not seem to have been screened in the SEA, or if they have, they are under a different name or have been screened out with no negative impacts (which Natural England would disagree with), this must be clarified. The missing schemes are; Thanet Coast desalination and Thames	

Reference	Comment	Southern Water Response
	Estuary desalination. These options are mentioned in the document but then not included in the screening tables (page 68 onwards). It is unclear how these desalination options will not have negative operational impacts on biodiversity, there is a lack of information available to justify this, especially as it is not apparent where these schemes will be situated. • The conclusions drawn for those that are similar options do not seem to be consistent and there is a lack of detail to justify these differences. For example, the Petworth groundwater option is deemed to have a significant negative landscape impact (due to being located within South Downs National Park), whilst the Newbury groundwater option, which is situated within the North Wessex Downs AONB (Area of Outstanding Natural Beauty), only has a moderate impact. This option also has the potential for significant operational and construction impacts. • There is a lack of information provided to justify the groundwater options not having a negative impact on the “Water, Protect and enhance the quality of the water environment and water resources” objective, which currently has no options screened in for it. Without environmental assessments at these sites, impacts cannot be ruled out, where previous investigations cannot always be relied upon to support conclusions as there may have been material change such as the evidence base may not be up to date. • Marine Conservation Zones (MCZs) are included in the screening criteria; however, it is not clear if impacts have been fully considered on these sites, especially for schemes such as desalinations. For example, the Thanet Desalination will discharge directly into or adjacent to the Thanet Coast MCZ which has not been included in the screening. • The conclusions drawn for the Candover drought option do not match in the SEA and HRA, the HRA must be updated as outlined in the comments above in the HRA section. The Lower Itchen drought order options seem to have been screened in the SEA	

Reference	Comment	Southern Water Response
	and not the HRA, the conclusions would be similar to that of the Candover drought options as both were assessed to the IROPI and compensatory measures stage of the assessment, for impacts to the River Itchen SAC. The conclusions must match for both the SEA and HRA, in this case the SEA is more accurate As a donor company of bulk supply to various NAVs the company must ensure the relevant environmental assessments for these transfers have been undertaken, in relation to the bulk transfer and the supply abstractions, the SEA must be updated accordingly if any environmental impacts are identified from these sources/transfers. More details on this issue are outlined in section 1.4.4 of this letter.	
NE20	Table 5-4 (page 132) of the SEA summarises the post mitigation significant effects, it is unclear why this has only been completed for significant effects and not moderate effects, these must also be summarised in this section to ensure those effects are identified and can be addressed. The table title also implies these options have remaining significant effects post mitigation being applied, mitigation should be removing significant effects, this must be made clearer within the SEA. The SEA has also identified generic monitoring that might be appropriate, but in most cases, monitoring needs to be tailored to address the uncertainties of each option where appropriate, if it is not specific at a scheme level there is not enough confidence what is proposed will be sufficient to fill evidence gaps, this must be addressed. No timetable has been provided for the completion of this monitoring to remove impacts in the plan period. For options earlier in the WRMP (pre-2035) further details are required such as a timetable that ensures evidence gaps can be delivered well in advance and support the evidence base in determining whether options are viable.	Consistent with SEA regulation 12(2), the SEA "*shall identify, describe and evaluate the likely significant effects on the environment of implementing the plan or programme* [the WRMP]" and Schedule 2 (6) sets out that the Environmental Report shall (amongst other requirements) detail the "*likely significant effects on the environment*". Schedule 2 (7) requires that the Environmental Report shall present "*The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme*". The revised Environmental Report of the revised draft WRMP has been undertaken to be compliant with these requirements, which do not require reference to minor or moderate effects. SEA regulation 17 requires: "*(1) The responsible authority shall monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake*

Reference	Comment	Southern Water Response
		appropriate remedial action. *(2) The responsible authority's monitoring arrangements may comprise or include arrangements established otherwise than for the express purpose of complying with paragraph (1)*". Section 9.5 of the Environmental Report reflects these requirements and notably takes into account the allowance of part (2) to ensure the monitoring measures proposed do not duplicate existing commitments. In consequence, the frequency of data collection is linked to existing monitoring programmes, with the data sources also reflective of the responsible body.
NE21	As referred to in section 1.1 of this letter, the catchment measures proposed by Southern Water should be assessed where applicable in the SEA, especially as in many cases these measures are likely to have a positive benefit.	The revised catchment management measures have been reviewed, and where applicable and supported by appropriate information have been included in the revised Environmental Report of the fdWRMP24.
NE22	Natural England also have the following comments on the SEA in-combination/cumulative assessment: • The cumulative impacts /in-combination assessment conclusion in the HRA and SEA do not seem to match especially in relation to biodiversity impacts. In addition, Natural England do not agree with the conclusions for all options, this must be addressed. For example, cumulative impacts seem to have been screened out with little or no supporting evidence, in some cases the supporting evidence would suggest a cumulative impact, contradicting the decision of screening these out (this is the case with the various desalination options). It is noted that these options have been assessed appropriately and cumulative impacts have been identified for climatic factors. • Table 7.2 (page 142) of the SEA identifies three drought options which could have cumulative impacts, but incorrect mitigation has	Section 6 of the SEA Environmental Report presents the findings of the assessment of cumulative effects (including secondary and synergistic effects) taking into accounts for both intra and inter plan and programme. The cumulative effects arising from the WRMP24 are presented for both construction and operation and pre- and post-mitigation against all the SEA topics. This has identified cumulative effects of the dWRMP24 in conjunction with the draft Regional Plan. This has been reviewed to ensure appropriate identification, description and assessment of likely significant cumulative, secondary and synergistic effects. This will take into account where relevant, other WRSE companies plans.

Reference	Comment	Southern Water Response
	been considered, for example the text in the mitigation comments for those options refers to saline waste from either desalination and water recycling options that were not identified as options with cumulative impacts. • As previously raised in this letter, further information and assessment is required across all relevant water companies (and within WRSE's regional plan) to justify the conclusion that there are no in-combination impacts from desalination options on designated sites and biodiversity. These options should be screened in the cumulative assessment appropriately and the impacts identified (as per table 7.2 and section 7.3.2 Other Water Company Water Resource Management Plans (WRMPs)). • Please note Natural England and the Environment Agency are still working with Southern Water on the most current drought plan HRA (and subsequently this has not yet been published), in particular the in-combination impacts of drought options. Due to this, conclusions may change and therefore it must not be assumed cumulative impacts will not occur. If this affects assessments with options early in the WRMP timeline, this must be finalised and updated in this dWRMP (especially within section 7.3.2 Southern Water Drought Plan 2022). Other water company drought plans have not been considered in this section; this needs to be considered in the screening. • Please note the River Basin Management Plans (RBMP) 2022 are now available (as of December 2022). These should be considered within section 7.3.3 River Basin Management Plans (RBMP); Thames River Basin District and South East River Basin District Plans. • Whilst Appendix D lists the drought plans and WRMPs of other water companies which need to be considered in the cumulative effects assessments, this should also include the NAVs within Southern Waters supply area. • Please ensure section 7.3.2 which covers the WRSE regional plan is updated based on any changes made to the regional plan	

Reference	Comment	Southern Water Response
	after the consultation period, as some conclusions could have changed. Some uncertainties remain around the conclusions drawn at this stage, some of these must be addressed by further environmental assessments.	
NE24	**1.2.1 SSSIs in the SEA** An assessment of the SSSIs within the study area has been undertaken, the SSSI assessment is not currently a distinct identifiable section in the SEA. Natural England recommends the SSSI section is updated to make it a clear section, with SSSI and local wildlife sites impacted by a scheme clearly identified for each option. Natural England also have the following comments on the SEA regarding SSSI assessments: • The plan does not list the specific SSSIs for each option in the main documents, this is required to ensure all the relevant SSSIs, and their interest features have been identified and the impacts to these sites correctly assessed. • The SEA should also assess duties to restore sites where relevant within the SEA area. • Appendix E (environmental baseline) list the SPAs, Ramsar's and SACs within the plan boundary area which are impacted, but not to the SSSIs, national or local wildlife sites level, this section must be updated to include these sites. • When undertaking assessments of impacts to SSSIs, relevant documents such as the citation, Favourable Condition Table (FCT) and condition assessment data should be referred to. • The dWRMP does not include proposals to enhance SSSI resilience to potential impacts from changes in water availability including improving site condition, in line with the company duties as set out in Annex 2. • It is not clear whether improvements are timetabled to meet the 2042 target within the 25 Year Environment Plan. Though there are sporadic improvements suggested within the SEA as part of	The Environmental Report of the fdWRMP24 has been amended to ensure the consistent treatment of designated conservation and landscape sites and features within the SEA of the revised preferred options. This includes SSSIs, SSSI risk zones, MCZs, NNRs, Ancient Woodlands, National Parks and AONBs, and supplements the range of features already considered when identifying, describing and evaluating the likely significant effects of the WRMP24. This includes amendments to Appendix F (the baseline information) to reflect the range of designated sites and features outlined. The Environmental Report of the fdWRMP24 has been amended to reflect the most recent information from the Drought Plan e.g. the findings of the latest environmental assessments undertaken to support the Test Drought Permit submission in 2022. Annex 9 'Protecting and Enhancing the Environment' has been updated. The tables in Appendix F set out the SPAs, SACs and Ramsar sites within the study area. As noted in the text there are over 500 SSSIs within the study area. Additionally, there are over 200 LNRs. Including such extensive list is considered disproportionate to the strategic nature of the SEA and the list of effects to be considered (Schedule 2(6) of the SEA regulations). However, the potential impacts on SSSIs, NNR and LWS have been taken into account in the assessment.

Reference	Comment	Southern Water Response
	mitigation strategies, there is not a commitment or deadline to have these improvements completed. • It is unclear at this stage if the monitoring and/or mitigation proposed for SSSIs will be adequate, further details and specific options will be needed in most cases for the relevant supply options. • Where there is a within-licence abstraction impact on a protected site which will increase with growth during the plan period, these impacts will need to be mitigated or removed. This should consider whether demand management and/or operational minimisation can support minimisation or removal of impacts on protected sites. It is currently unclear in the SEA how the impacts from drought options (to both SSSIs and Habitats sites) will be removed, especially as schemes are often not being linked where applicable to these drought options. Any options which alleviate the need for drought options should be clearly identified in the SEA. Also, any drought options which do not currently have a scheme in the plan to remove the impact, requires further assessment to ensure impacts can be removed. Page 5 of Annex 9 refers to CSMG (Common Standards Monitoring Guidance) targets in relation to flow only, CSMG targets cover other parameters such as water quality and are the parameters used to assess the condition of a designated site and their interest features (this applies to any designated sites, not just those that are rivers). The following needs to be considered across all designated sites that are screened in / are assessed and in relation to the wording on page 5; Common Standard Monitoring Guidance, is used by Natural England to assess whether a designated site meets the criteria for favourable condition, this can for example include flow and water	The options assessments have been reviewed and revised where necessary.

Reference	Comment	Southern Water Response
	quality targets for water-dependent designated sites such as rivers.	
NE25	**1.2.2 Protected landscapes in the SEA** Landscapes in general and protected landscapes have been considered in the SEA, and some negative impacts identified for some options. But it is unclear how the conclusions have been drawn and justified in some cases. For example, some similar options within protected landscapes have been deemed to have a significant negative impact whilst others have not, such as the Petworth groundwater scheme which does have a significant impact whilst the Newbury groundwater scheme a moderate impact. Where possible protected landscapes should be avoided for major infrastructure work. Where this is not possible, further engagement is needed with Natural England and relevant authorities at an early stage to minimise impacts or determine alternative schemes. Natural England is pleased to see the historic environment is considered in the SEA objectives, as well as engagement being planned with Historic England on the cultural heritage aspects of this plan (of which are important protected landscape feature). As outlined in the dWRMP (which Natural England support) impacts to historic sites and landscapes should be avoided where possible. Southern Water should also ensure they meet relevant heritage and nature recovery objectives of which the historic environment is part of, as outlined in the 25 Year Environment Plan, please refer to Annex 2 for further details. Generic mitigation has been proposed in the SEA, some of which covers impacts which could occur in protected landscapes. At this stage, without more	The Environmental Report of the fdWRMP24 has been amended to ensure the consistent treatment of designated conservation and landscape sites and features within the SEA of the revised preferred options. This includes amendments to Appendix F (the baseline information) to reflect the range of designated sites and features outlined. Mitigation proposed reflects the strategic nature of the plan, and anticipates further stages of option refinement and scheme development, which will be supported, as appropriate by further assessment and mitigation. Where relevant, this could include the use of a Protected Landscape Mitigation Strategy. NE's concerns with underestimation of impacts on landscape is noted. The assessment of the preferred options has been reviewed and revised (where necessary) to ensure that they are strengthened and consistent treatment is given to the options. This has included ensuring reference to protected landscapes as relevant in the assessment of the objective "Conserve, protect and enhance landscape, townscape and seascape character and visual amenity." Where options have been identified as being in close proximity (within 10km of) to protected landscapes these designations have been identified in the assessment and the likely effects have been assessed (based on the option information). The assessment is proportionate to the level of information available about the option and proportionate to a strategic assessment.

Reference	Comment	Southern Water Response
	detailed assessment on the options proposed it is unclear if this mitigation will be suitable to alleviate the impacts identified, this should be addressed, if this applies to any options early in the plan this will require full assessment in this dWRMP. A Protected Landscape Mitigation Strategy may be needed where multiple schemes impact a protected landscape over the plan period, this should also include the options of other companies within the same protected landscape.	
NE26	**1.2.3 Biodiversity in the SEA** Natural England would like to commend Southern Water for the catchment measures being implemented, such as those through the Catchment First programme which will lead to greater environmental resilience and biodiversity improvements. Though these catchment measures may not provide direct deployable output benefits and primarily seek to improve environmental functioning, as an option within the WRMP, they should be considered within the relevant environmental assessments. This includes the HRA, SEA, Natural Capital Assessment (NCA), Biodiversity Net Gain (BNG) and Invasive Non-Native Species (INNS) assessments. Natural England defers to the Environment Agency on WFD requirements. A BNG or NCA does not appear to have been completed as part of this plan, these sections should be completed. If these have been undertaken, these need to be signposted to within the WRMP and be clearly identifiable sections or documents. In Appendix E (Environmental baseline) there is a section for priority species and habitats, but this is not listed per scheme, so it is hard to determine what has been assessed where. This information should be provided where the conclusions for each option and the assessments undertaken should be clear. For example, it might be clearer if this section is in tabular form with a column for protected species and column for protected habitats.	The SEA provides a proportionate assessment of the WRMP24 covering a comprehensive range of effects, consistent with those identified in Schedule 2(6) of the SEA regulations and anticipated for water resource proposals. This includes effects on biodiversity, flora and fauna, which are assessed against the SEA objective "*Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)*" and supported by a range of assessment questions. including whether "*the option likely to affect ancient woodland, priority habitat or species?*". Information is presented in the revised preferred options assessments that identifies whether priority habitats and species are present and potentially affected. The role of the SEA is to identify, describe and evaluate the likely significant effects in line with the requirements of the SEA Regulations. The requirements under the Environment Act 2021 lie outside the SEA regulatory requirements. Under the Biodiversity, flora and fauna SEA objective “Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)” and supporting 12 guide questions, the assessment includes consideration of enhancing biodiversity and species with assessment guide questions referring to (amongst other things): “Are there any opportunities for habitat creation or

Reference	Comment	Southern Water Response
	This must include all protected species and priority habitats assessed within the SEA for the relevant options. For options where mitigation is required, this needs to be specific and appropriate for those sites impacted and this must be updated in the SEA once full assessments are completed. Limited details have been provided for the monitoring of priority habitats, this has been done at a plan level with generic themes and not a scheme level. We understand that further specific monitoring requirements will be incorporated into detailed designs and plans for scheme development, which will be discussed with relevant regulatory and statutory bodies. However, for those options in the earlier stages of the plan more information and commitment to the required specific monitoring for those options must be included in this dWRMP, especially where there is uncertainty, potential impacts and / or mitigation proposed. The Local Nature Reserves (LNRs), local wildlife sites/SINCs should also be assessed/listed if deemed to be impacted, clarity is required to ensure this has been completed in the full screening assessment (Appendix H and I). Any risks identified to these sites should be highlighted where relevant. Natural England would like to remind the company that the SEA should consider the public body duties under the NERC Act 2006, as strengthened by the Environment Act 2021 to “further the conservation and enhancement of biodiversity”, including restoration and enhancing a species population or habitat.	restoration? Will the option contribute to the loss or gain in habitat connectivity? Is there potential for contribution to achieving ‘favourable’ conservation status or for creation of new habitats and species “of principal importance for the purpose of conserving biodiversity” covered under Section 41 (England) of the NERC Act (2006)?”
NE28	**1.2.5. Climate change in the SEA** The SEA has included a climatic objective, but this objective is society focused, rather than wildlife resilience focused. Natural England strongly advises that the assessment of WRMP options considers their impacts on nature in light of climate change and	The SEA provides a proportionate assessment of the WRMP24 covering a comprehensive range of effects, consistent with those identified in Schedule 2(6) of the SEA regulations and anticipated for water resource proposals. This includes effects on biodiversity, flora and fauna, which are

Reference	Comment	Southern Water Response
	assess whether the options would hinder wildlife adaptation and/ or resilience to environmental changes. The impacts from climate change are covered and referenced in Appendix E (Environmental baseline), however, more clarity is required to understand whether this has been fully considered when assessing impacts of each option. Beyond what has been considered during the option selection stages conducted by WRSE for future environmental scenarios and reduction of abstractions, there does not seem to have been explicit consideration to assess how much water is needed to support nature-based solutions in the SEA. Reference to the England peat action plan should be made for sites it is deemed necessary to wet peat to help achieve the objectives of the site and meet the targets outlined in the peat action plan.	assessed against the SEA objective "*Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)*" and supported by a range of assessment questions. including whether "*the option enables or reduces the potential of water dependent wildlife to adapt to climate change?*". The SEA objective specifically related to climate change does include specific reference to reducing vulnerability to climate change ("Reduce vulnerability to climate change risks and hazards"). Under the Biodiversity, flora and fauna SEA objective there are assessment questions of relevance to climate change. Specifically: 'Does the option enable or reduce the potential of water dependent wildlife to adapt to climate change?' More broadly the assessment criteria includes references to habitat creation and restoration and the objective seeks to protect and enhance biodiversity. The baseline (Appendix F) recognises explicitly that climate change is likely to impact on wildlife.
NE29	**1.2.6 Marine Conservation Zones (MCZs) in the SEA** Several MCZs are situated within the plan area and appear to have been assessed from the information provided (Appendix E - environmental baseline, lists 14 in the plan area). All relevant MCZs should be identified in the SEA (the obligations to notify Natural England where South East Water might impact MCZs is outlined in Annex 2, Section 2.2.7). It should also be made clear in the assessments and conclusions which options could impact upon these sites. The MCZ assessment, much like the SSSI, should be in a clearly identifiable section. If it has not already been used and referred to, the conservation objectives and advice for each MCZ should also be used when undertaking these assessments.	The Environmental Report of the fdWRMP24 has been amended to ensure the consistent treatment of designated conservation and landscape sites and features within the SEA of the revised preferred options. This includes SSSIs, SSSI risk zones, MCZs, NNRs, Ancient Woodlands, National Parks and AONBs, and supplements the range of features already considered when identifying, describing and evaluating the likely significant effects of the WRMP24. This includes amendments to Appendix F (the baseline information) to reflect the range of designated sites and features outlined.

Reference	Comment	Southern Water Response
NE30	**1.3 Water Framework Directive Assessment** **C**omments on the WFD assessment are a matter for the Environment Agency however Natural England notes the following: • The WFD assessment needs to be checked to ensure the options assessed are consistent and align with those assessed in the HRA and SEA (and those listed in the technical report). • It is advised that the WFD assessment, for relevant options, identifies when the waterbody being assessed is also designated as an SSSI, SAC, SPA and/or Ramsar and links to other appropriate assessments such as the SEA and HRA. It is noted this has been done in some instances such as those in the Arun Valley, however this is not a consistent approach. Sites where this linkage is not clear include those in the vicinity of the River Itchen and River Test waterbodies. • Southern Water have included the risk posed to Groundwater Dependent Terrestrial Ecosystems (GWDTE) which are also SSSIs within the SEA.	The revised WFD assessments of the revised dWRMP have been refined to address this comment

D.3 Arun District Council

Reference	Comment	Response
099.5	On a wider scale, for the Arun coastline, account should also be taken of the Kelp Restoration Project focused on the Sussex Bay, plus that it has been agreed by the Council to commission consultants to look at whether to apply any Coastal Change Management Areas (CCMA).	We will consider the Kelp Restoration Project in the assessment of any future options which could impact the Sussex Bay and take account of any Coastal Change Management Areas if applied. The Sussex Coast desalination scheme has been removed from the fdWRMP24 because a suitable alternative location could not be found.

D.4 Forestry Commission

Reference	Comment	Response
291.2	**Comment 1:** Development associated with the plans are expected to result in the direct loss and impact on ancient woodland. The Plans should exhaust efforts to avoid impacts on ancient woodland, ancient trees and veteran trees. Ancient woodlands, ancient trees and veteran trees are irreplaceable habitats which have established over centuries that can act as key parts of complex and connected ecosystems. They are part of our cultural heritage that are the legacy of the past and for future generations. We would like to highlight our concern regarding the risk of loss and detrimental impacts to ancient woodland sites from other development proposed by the Plans. Paragraph 180(c) of the NPPF sets out that development resulting in the loss or deterioration of irreplaceable habitats should be refused unless there are wholly exceptional reasons and a suitable compensation strategy exists. In considering the impacts of the development on Ancient Woodland, Ancient and Veteran trees, the planning authority should consider direct and indirect impacts resulting from both construction and operational phases. Likewise, for developments covered under the Planning Act 2008, the draft Development Planning Statement for Water (2018) states:	Comment noted. The Environmental Report of the fdWRMP24 has been amended to ensure the consistent treatment of designated conservation and landscape sites and features within the SEA of the revised preferred options. This includes SSSIs, SSSI risk zones, MCZs, NNRs, Ancient Woodlands, National Parks and AONBs, and supplements the range of features already considered when identifying, describing and evaluating likely significant effects. This includes amendments to Appendix F (the baseline information) to reflect the

Reference	Comment	Response
	"4.3.14. Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of ancient or veteran trees found outside ancient woodland, unless there are wholly exceptional reasons, for example where the need for and other public benefits of the development, in that location, would clearly outweigh the loss or deterioration of the habitat, and a suitable compensation strategy exists." Please refer to Natural England and Forestry Commission joint Standing Advice for Ancient Woodland and Ancient and Veteran Trees, updated in January 2022. The Standing Advice can be a material consideration for planning decisions and contains advice and guidance on assessing the effects of development, and how to avoid and mitigate impacts. It also includes an Assessment Guide which can help planners assess the impact of the proposed development on ancient woodland or ancient and veteran trees in line with the NPPF. We would encourage the specific reference for development to have regard to the standing advice, highlighting direct and indirect impacts and the Assessment Guide that is available to help. Based on the broad locations being proposed by the plan, this includes, but is not limited to, potential loss and impacts from Broad Oak Reservoir, Blackstone Reservoir (depending on location) and SESRO. These projects should be considered in the context of the substantial direct loss of Ancient Woodland already occurring as a result of the Havant Thicket Reservoir. The Strategic Environment Assessment does not appear to be adequately acknowledge this loss in relation to biodiversity flora and fauna impacts on the Best Value option (table 5.2). It is unclear why this has been omitted as this could skew the baseline for appraising options. The construction of Havant Thicket Reservoir is resulting in the direct loss of 15.2 ha of ancient woodland. While we appreciate the public needs for this reservoir we are particularly concerned by the additional indirect loss of further ancient woodland for access to establish and then maintain the site (especially as routes which could have avoided this loss were available). While we support the compensation package which is being delivered we must advise that the importance of full canopy ancient woodland does not seem to be recognised and the package includes management of existing woodlands already owned by water utilities	range of designated sites and features outlined.

Reference	Comment	Response
	which have been neglected for decades. We would strongly encourage the Plans to exhaust all reasonable options of reservoirs and other development associated with the Plans, in terms of their location, design and construction/operation, to: avoid and minimise any loss of ancient woodland, avoid indirect loss of ancient woodland, ensure that any indirect impact on adjacent ancient woodland is fully evaluated and mitigated. The standing advice also makes reference to a robust compensatory package of full canopy woodland for any loss of ancient woodland. We would advise that such a compensatory package should be substantial, seeking to buffer and connect nearby ancient woodland to enhance the overall resilience of the wider woodland infrastructure and treescape to climate change and deliver a multitude of public benefits (including biodiversity, water quality and public health benefits) in designs which are self-supporting. As part of this, we would welcome a clear commitment to avoid impacts on ancient woodland. Veteran Trees are also irreplaceable so their loss should be avoided and treated the same as Ancient Woodland. We would welcome within the plan the statement to establish the next generation of veterans. We welcome the Plans' reference to achieving environmental gains, including biodiversity net gain. Before this can be achieved, existing habitats need to be protected as far as possible, with irreplaceable habitats being among the highest priorities to protect. This is needed before overall environmental gains are possible to achieve.	

D.5 HIWWT (Hampshire & Isle of Wight Wildlife Trust)

Reference	Comment	Response
287.10	**Hampshire Water Transfer and Water Recycling Project' at Havant Thicket Reservoir** The Trust has been involved in reviewing the Havant Thicket Reservoir proposals for several years, including through the Havant Thicket Stakeholder Board. We have been made aware of a number of concerns raised by the community regarding	The main aim of the projects is to protect these sites and SW is responding to the EA & NE request to reduce our abstraction reliance on particularly the rivers Test & Itchen, while not increase

Reference	Comment	Response
	the environmental impact of 'Hampshire Water Transfer and Water Recycling Project' proposals for Havant Thicket. We therefore seek firm commitments, supported by robust evidence, that the proposals would not adversely impact the River Itchen Special Area of Conservation (SAC) or Chichester and Langstone Harbours Special Protection Area (SPA), the Solent Maritime SAC, the Solent and Southampton Water SPA and Ramsar and, Portsmouth Harbour SPA and Ramsar.	(and preferably reducing) the impact on the other sites. SW is working closely with the EA, NE & the MMO, and other stakeholders on the HWTWRP scheme.
287.12	***Impacts to our legally protected harbours in the Solent*** Currently, we do not consider that Southern Water has assessed the environmental impact of the 'Hampshire Water Transfer and Water Recycling Project' on the designated Solent Marine Sites. In particular, we urge Southern Water to provide more information, including a Habitats Regulations Assessment (HRA), on what will be directly discharged into the Solent as a result of this project and the potential impacts on the designated sites. We seek confirmation that the net benefit of the Havant Thicket reservoir on nutrients in the designated harbours will be maintained. We would like to see accurate detail of the potential increase in inputs through the Lavant and Hermitage Stream and also the volumes and composition of the outputs through the long sea outfall. Considering the significant public concern, we urge this information to be provided in time for a robust consultation on the proposals in the summer.	Surveys on a project of this size take time to be completed and assessed appropriately, but will then inform the public consultation. The net benefits will have to be maintained or improved upon as part of the HWTWRP scheme
287.13	***Impacts on the ecosystems at Havant Thicket reservoir*** During the initial proposal and consultation for Havant Thicket reservoir, we were pleased to see the creation of new wildlife habitats integrated into the reservoir design. The wildflower-rich outer slopes would create much-needed pollen and nectar for insects and the wetland is probably the main feature of interest from an ecological point of view within the locale of the reservoir. Furthermore, technical analysis from Natural Capital Solutions suggests that there is a large increase in the ecosystem services benefits that may be derived from the reservoir project worth approximately £2,243,667 annually in a normal year, rising to £4,913,467 annually in a drought year.	With regard to integration of the project with the approved plans for the Havant Thicket Reservoir, Southern Water and Portsmouth Water are working together to ensure that environmental commitments made in respect of the reservoir, particularly around the wetland, will be maintained.

Reference	Comment	Response
	We need to see clear evidence provided by Southern Water that the water recycling proposals for Havant Thicket will not undermine the net gain for wildlife or the ecosystem services provided by the project.	
287.10	**Hampshire Water Transfer and Water Recycling Project' at Havant Thicket Reservoir** The Trust has been involved in reviewing the Havant Thicket Reservoir proposals for several years, including through the Havant Thicket Stakeholder Board. We have been made aware of a number of concerns raised by the community regarding the environmental impact of 'Hampshire Water Transfer and Water Recycling Project' proposals for Havant Thicket. We therefore seek firm commitments, supported by robust evidence, that the proposals would not adversely impact the River Itchen Special Area of Conservation (SAC) or Chichester and Langstone Harbours Special Protection Area (SPA), the Solent Maritime SAC, the Solent and Southampton Water SPA and Ramsar and, Portsmouth Harbour SPA and Ramsar.	The main aim of the projects is to protect these sites and SW is responding to the EA & NE request to reduce our abstraction reliance on particularly the rivers Test & Itchen, while not increase (and preferably reducing) the impact on the other sites. SW is working closely with the EA, NE & the MMO, and other stakeholders, on the HWTWRP scheme.

D.6 Havant Climate Alliance and Havant Friends of the Earth

Reference	Comment	Response
281.2	A. Project to Recycle Effluent from Budds Farm and transfer it to Havant Thicket Reservoir. 1.The planning application agreed by Havant Borough Council and East Hampshire District Council, was for the Reservoir to be entirely filled by excess water from Bedhampton Springs, during winter. Being built by Portsmouth Water and funded by Southern Water, it was envisaged to be an adequate supply for transfer to the Southampton area, to avoid over extraction from the Itchen and Test chalk streams.	1) the original 21 Ml/d Havant Thicket Scheme was part of the wider mitigations that also included 75 Ml/d of Desalination in the Southampton / Solent area to provide adequate supply for the Test & Itchen steams. 2) Water Recycling was the alternative plan if desalination was not consentable and would need produce less carbon, both in its construction and

Reference	Comment	Response
	2. Southern Water's recycling project, was not presented until after the reservoir had planning permission. It will be both environmentally damaging and a huge source of carbon emissions, due to the energy needed for reverse osmosis (even if only 10% of that needed for desalination) and the amount of new infrastructure that needs to be built, with a Waste Processing Plant, pumping stations and more than 40 Km of pipeline from the reservoir to Otterbourne. We doubt that the high level of carbon emissions can be mitigated. 3. The pipelines required will be hugely disruptive for residents along their route. 4. Such a major infrastructure project will greatly increase water bills for Southern Water customers and may thus increase the profits of the company. With the involvement of Macquarie we are suspect that profit is the main driver for this project, when smaller, more environmentally friendly schemes would generate less income. 5. We understand that water recycling needs to be very carefully managed and monitored to avoid contaminants and pathogens getting into the water supply. We do not trust Southern Water to do this, in view of their poor track record on pollution incidents and lack of compliance with regulations. A member of our group submitted 15 questions to Southern Water after a visit to their pilot recycling plant on 24th January '23 but to date has not received answers. These included questions about risks from commercial/industrial contaminants, and the presence of chemicals in reverse osmosis membranes. That information should have been available before the end of the Consultation. 6. The results of Environmental Impact Assessments and Habitats Regulations Assessments are not expected until later this year. A public consultation should not be taking place until after those results are known and fully publicised. The public have had little information about alternative schemes. The Recycling Project has been presented as the only reasonable option.	operation than the original WRMP 19 Desalination Plant Proposed. 3) Southern Water will be working with landowner and customers to reduce the impact of providing drinking water, however, strategic projects do have short term impacts during construction. 4) The original desalination project was proposed as part of WRMP 19, before any change of ownership. Other smaller schemes were considered, however, due to the size of issue even together they were no sufficient. 5) Comment noted 6) This strategic consultation has to be based on initial Strategic Environmental Assessments, with more specific assessments based on surveys, being presented at more specific project consultations. 8) The reservoir levels will be managed - Recycled water has lower nitrate levels than the spring water, 10) The scheme looks to work with the climate variation, by using the reservoir storage, however, this needs to be augmented by a smaller Water Recycling Plant

Reference	Comment	Response
	7. This round of public consultation has been inadequate. Very few people knew about it until local groups such as ours started raising concerns. 8. There is concern about how constant topping up with recycled water will affect the wetlands and biodiversity planned for the reservoir. When full, some of the water from the reservoir will also be released into Langstone Harbour via streams. We do not know the effect of this on that nationally designated habitat. 9. Portsmouth as well as Southern Water customers will receive recycled water mixed with spring water. We don't know whether this will affect the taste of the water. This and/or the thought of recycled effluent may drive more people to use bottled water for drinking, which will be environmentally damaging. 10. We are told that water recycling is a tried and tested technology used around the world. However this is mainly in drought-stricken countries such as California and Namibia. Climate change models show that although we will suffer periods of drought, these will be interspersed with periods of heavy rain with the risk of flooding. Rather than recycling we should be looking at solutions that enable us to harvest and store that water.	

D.7 Historic England

Reference	Comment	Response
256.25	**4. Comments on the Strategic Environmental Assessment (SEA)** A. When considering the objectives of the dWRMP24, the fact that it is uncertain (p63) what the impact will be on the historic environment from delivering "a secure and wholesome supply of water" suggests a lack of sufficient evidence. B. The SEA objectives include "Conserve, protect and enhance the historic environment, including archaeology". Note archaeology is the study of	The revised SEA Environmental Report of the revised dWRMP will be reviewed to reflect any necessary changes. Please note however, that the conclusions of uncertainty may be valid, give the long term nature of the plan, and that in some instances the assessment will be reflecting the uncertainty associated with

	archaeological remains, rather than the remains themselves. As a result, we recommend minor amendment to: “Conserve, protect and enhance the historic environment, including archaeological remains”. C. Section 8.2.7 focuses on the mitigation of effects on Cultural Heritage and Landscape. We advise more detailed consideration of archaeological remains, known and not yet known, with the aim not only linked with the dissemination of results but also - in line with national planning policy - the avoidance of harm and mitigation of unavoidable harm, as appropriate. D. We recommend further work on the proposed monitoring indicators for cultural heritage, informed by liaison with relevant heritage professionals. The indicator associated with the condition of buried archaeological remains would benefit from minor wording changes. The reference to consultation, though welcome, does not provide a focused indicator to monitor, nor do the datasets maintained by Historic England. Clarity is needed in the indicators that Southern Water intend to use. E. Table D14 - we advise stating the names of the World Heritage Sites within the study area. Also, we suggest making clear that conservation areas are designated heritage assets; though designated locally, they are afforded the same level of protection as other designated heritage assets in national planning policy. As Southern Water will be aware, the formatting of this appendix has gone astray and so the maps are not readable, exemplified by Figure D10. F. Given the figure quoted is from 2020, it would be inaccurate to state that “currently” there are 1120 designated assets on the HAR register. It would be better simply to state the year for the data.	unknown underground archaeological remains. The SEA provides a strategic level assessment, proportionate to the information available. Whilst the request for further specificity is noted, this has been balanced with the stage of the WRMP within the infrastructure planning process. The preferred options for managing water supply and demand contained in it will need to be implemented through specific projects. As part of this process, each project may be subject to further assessment to understand and manage its potential environmental and social impacts. These assessments, which may include HRA and EIA, will take account of the issues discussed in this Environmental Report but will also be informed by the greater detail available as the work progresses about construction techniques, building materials, agreed locations and routes

D.8 Langstone Harbour

Reference	Comment	Response
278.5	Effluent recycling using the energy-intensive reverse osmosis process will produce brine as an end product, which will have to be discharged via a long sea outfall into the Solent. Brine is also the by-product of desalination and the effects of discharging it into the marine environment have been widely studied. The inherent salinity and temperature of this effluent can have detrimental effects on the marine environment. Estuarine species are often euryhaline, whereas many marine	The discharges from reverse osmosis are dependent on the water they treat, and normally doubles the starting concentration. As the treated effluent has a lower salinity level, 1.5 g/l, whereas sea water is 35 g/l, the salinity in the waste steam is around 3 g/l. a tenth of normal

	species are stenohaline and are limited by their narrow range of physiological tolerance. Salinities at the margins of this tolerance range have the potential to alter species' behaviour, limit reproduction, and reduce fitness for survival in their environment. Brine underflows also deplete concentrations of dissolved oxygen in the receiving water, which can cause anoxic conditions for benthic organisms, possibly translating into ecological repercussions throughout the food chain in the wider Solent European Marine Site.	sea water found in the Solent. this is also the reason why the plant is less energy intensive when compared to sea-water desalination.
278.6	**In Summary** To be ready for the impacts of climate change and a growing population, alternative strategic solutions must be explored in further detail. We know that climate change will bring wetter winters and drier summers. Investing in natural solutions that capture and store winter rain, and ensure aquifers are sufficiently supplied during the summer, provide a wealth of ecosystem services, reduce fluvial flooding risk, and create vital wetland habitats to improve biodiversity. Additional winter storage reservoirs would provide a valuable addition to the aquifer recharge problem faced by water companies. Impacts of the aforementioned issues on the reservoir and heavily protected coastal habitats of the Solent need to be considered urgently as part of a comprehensive Habitat Regulations Assessment before approval is sought from the Secretary of State. We believe that Southern Water should take more time to consider and review the far-reaching ecological implications of the Water Recycling Plant and its links with Havant Thicket Reservoir, presenting the public with more information to help them make a suitably informed decision regarding the proposal.	We are completing more in-depth surveys and assessments as part of its EIA work for inclusion in the forthcoming public consultation. This will include marine impacts.

D.9 Solent Protection Society

Reference	Comment	Response
290.3	**Environmental risks at the selected construction site** The site selected for the new Water Recycling Plant is a former Havant Borough Council landfill site located beside Langstone Harbour, an environmentally sensitive site designated as an SSSI, SAC/SPA, Ramsar site,	The landfill does provide additional complexity for the HWTWRP Scheme, however, these are being taken into account in the proposed construction techniques. This risk will be developed and

Reference	Comment	Response
	which forms part of the Solent (European) Marine Site (SEMS). The landfill site was still in regular use into the 1990s and is still actively venting. It is currently unclear how landfill gas is managed on the site - a rigorous Gas Management Plan will need to be developed. Surface water on site will need to be surveyed, modelled, and considered in detail to prevent contaminated leachate from entering the Hermitage Stream and Langstone Harbour. The overall condition of the coastal defences in this location is deteriorating and we are concerned that an historic landfill with defences at risk of failure is not a suitable site for the type of construction proposed. The recycling plant and high-lift pumping station would require a service shaft to be sunk into the landfill, connecting to three service tunnels bored into the landfill from three separate directions. One of these tunnels would run below the bed of the Hermitage Stream, carrying waste output from the Budds Farm wastewater treatment works into the new plant. There has been no detail published explaining how maintenance for these pipelines and tunnels will be carried out and the company's poor reputation for maintenance of its distributed infrastructure assets does not give us confidence that the plant and pipelines for the new plant would be kept in good order. The risk of contamination to the harbour waters remains to be fully assessed. The environmental impact on the Havant Thicket reservoir and Langstone Harbour water bodies The environmental impacts of the recycling plant on the contents of the Havant Thicket Reservoir, and the discharge of flow from the reservoir to Langstone Harbour have not been modelled to include all potential impacts on the coastal habitats. Portsmouth Water was granted planning permission for the reservoir on an understanding that it would contain solely spring water from the Havant and Bedhampton springs thus delivering a net gain benefit to the environment. A reduction in nitrate inputs to Langstone Harbour was promised as part of this new reservoir scheme based on the fact that nitrate rich spring water which would have flowed into Langstone Harbour would instead be pumped up to the Havant Thicket Reservoir where the higher level of nitrates would naturally break down. This benefit would be significantly reduced under the new proposal as the proposed daily topping-up	assessed as part of the planning process and information presented in the next public consultation on the scheme. The Water Recycling Plant would not be discharging into Langston Harbour, but returns the flows to Budds Farm and the existing system. Modelling of any changes to the LSO is ongoing and, if required, any mitigations of the impacts will be included and presented in the next public consultation on the scheme. As the Water Recycling Plant uses final treated effluent from Budds Farm the nitrate level have been significantly reduced and are a typically more than a factor of 10 below the Havant and Bedhampton springs. The introduction of Recycled Water into Havant Thicket reservoir will support the reduction in nitrate levels as promised in the HTR planning application.

Reference	Comment	Response
	of the reservoir with recycled effluent would result in greater volumes of spring water being directly released into Langstone Harbour.	
290.4	**Concerns regarding reverse osmosis technology at this site** Effluent recycling using reverse osmosis is an energy intensive process which would produce brine as a by-product and the proposal shows such brine being discharged via a long sea outfall into the Solent. The Solent waters into which this brine would circulate are classified by Defra as important bivalve mollusc harvesting and shellfish waters. While the recycling of effluent via reverse osmosis is a process new to the UK, similar brine is also the by-product of desalination and the effects of discharging it into the marine environment have been widely studied. The inherent salinity and temperature of this effluent can have detrimental effects on the marine environment. Estuarine species are often able to adapt to a wide range of salinities, whereas many marine species are limited in their narrow range of physiological tolerance. Salinities at the margins of this tolerance range have the potential to alter species behaviour, limit reproduction, and reduce fitness for survival in their environment. Brine underflows also deplete concentrations of dissolved oxygen in the receiving water, which can cause anoxic condition for benthic organisms, possibly translating into ecological repercussions throughout the food chain. While the brine generated by the water recycling plant would be less intense than that assessed for the 2021 Southern Water desalination plant proposal at Ashlett Creek, the potential impact on the waters of the Solent cannot be ignored. The risk to the water bodies from inadequate or incomplete levels of treatment While we accept that the proposed water recycling plant would include some element of chemical water treatment in addition to filtration, there is a risk that the treated wastewater could do more harm than good, contaminating the reservoir with pathogens or altering the physiochemical properties of the reservoir through accumulation of chemical or biological contaminants (for example pesticides and natural hormones, as well as endocrine disrupting chemicals). Concerns about the effectiveness of nutrient treatment/removal	There is a significant difference in Sea Water Desalination and RO used as part of Water Recycling. The key difference is that the starting "treated wastewater" has a salt level of c1.5g/l, whereas sea water is c36g/l. Both processes roughly double the salt concentration in the waste stream, so 72g/l vs 3g/l. The waste stream under normal (minimum) flow is further diluted by the remaining treated waste water from Budds Farm before it enters the Solent. This will be considered as part of the environmental impact assessment and then presented in the public consultation. The level of treatment provided by a Full Advanced Treatment is aimed at reducing pesticides and natural hormones, endocrine disrupting chemicals and other contaminants of emerging concern, both from the UK and the US, to levels below the Spring Waters being transferred to HTR. Again this will be presented in the public consultation. Other strategic options have been considered, however, due to the level of resilience required and the significant increase to protect the chalk streams and ground waters within Hampshire these strategic options, like water recycling or long distance transfers are required. Softer engineering solution provide benefit in smaller droughts, but are lost when the droughts spread into multiple years. The alternative adaptive plant is currently for a larger

Reference	Comment	Response
	from wastewater raise the risk that, should the treatment of effluent be insufficient, increased nutrient loading will affect the chemical balance of the reservoir water and may cause eutrophic conditions both in the reservoir and in Langstone Harbour. Changes to Southern Water strategic delivery schedule warrants the reassessment of alternative sources SPS appreciates that alternative strategic solutions must be explored in further detail in order to cater for the predicted shortfall in drinking water supplies. We also understand that climate change will bring wetter winters and drier summers. Investing in natural solutions that capture and store winter rain and ensure aquifers are sufficiently supplied during the summer, provide a wealth of ecosystem services, reduce fluvial flooding risk, and create vital wetland habitats to improve biodiversity. Additional winter storage reservoirs would provide a valuable addition to the aquifer recharge problem faced by water companies. Use of water transfer from other regions should once again be reviewed. For example, the transfer of water from Wessex Water and Bristol Water were discounted by Southern Water during their 2021 'Water for Life' consultation, simply due to the relative schedule dates of these regional programmes. With the decision to drop the Ashlett Creek desalination project following the concerns raised during that previous consultation, Southern Water's own strategic schedule dates have now slipped and the availability of water transfer from the west of England reservoir projects should be reassessed.	water recycling plant, the conjunctive benefit of the HWTWRP is a smaller plant augmenting the reservoir.
290.5	**In summary** With appropriate research, we believe that there would be other environmentally sound and cost effective natural alternatives to the type of water recycling proposed by Southern Water. Such an approach would safeguard the delicate environmental balance within the Solent, its harbours and its estuaries, and would have the wholehearted support of the Solent Protection Society. Solent Protection Society does not support the Hampshire Water Transfer and	Without the augmentation of HTR with a water recycling plant the direct transfer element HWTWRP does not work and would empty the reservoir prematurely before a sever or extreme drought, resulting in continued reliance on drought orders and notices.

Reference	Comment	Response
	Water Recycling Plant component of Southern Water's 'Water Resources Management Plan'.	

D.10 Tracey Viney

Reference	Comment	Response
295.6	5. **The SW & WRSE is not a plan of 'least regret' plan for Hampshire**. They indicate that having a 'least regret' plan means a decision that balances minimal cost with maximum benefit accounting for any possible futures in the most feasible way (WRSE summary, page19). If this is a least regret plan then why are SW/WRSE selecting effluent recycling via Havant Thicket Reservoir. A scheme that has a huge cost to construct, a massive cost to operate 365 days a year even though it is only needed in a drought, a huge environmental impact (scored the highest we could see on the SEA negative impacts), has an enormous carbon footprint, is not the preferred water resource solution type selected by customers, and may well alienate consumers and drive them to bottled water. It is a solution that has a high risk of failure if a robust Habitats Regulation Assessment is undertaken, which would only delay further reductions in abstraction on the River Test & Itchen. I believe it is also highly likely to become a 'white elephant' as the Thames desalination plant has become. With the cost of operation being so high the company don't want to use it, such that much of its capacity was 'out for maintenance' when the plant was needed in the drought of 2022.	In addition to providing drought resilience the scheme is essential to allow both Southern Water and Portsmouth water to reduce the amount of water we abstract from the sensitive chalk streams in Hampshire, in particular the River Itchen. We expect that future licence reductions will need to account for revised flow targets which could include large reductions (10s of Ml/d) in normal year abstraction, especially if Natural England's Common Standards Monitoring Guidance Flow Targets are applied to the River Test and Itchen Abstractions. Having already ruled out desalination for Hampshire through the RAPID process there are few viable alternative options that can supply the required volumes of water we will need in the long term to meet environmental targets.

Appendix E Consultation Responses to the September 2023 Environmental Report and September 2024 Environmental Report and Southern Water Responses

This appendix presents the SEA related issues raised by the Environment Agency in Southern Water's statement of response and initial review of interim draft plan documents shared in 2023, and by the Environment Agency, Natural England, Historic England, and Wildfish in September 2024.

The table below sets out issues raised by the Environment Agency related to the 2023 consultation and provides a response as to how they have been addressed.

Reference	Comment	Response
Issue 20	The conclusions on the assessment of 'Reasonable Alternatives' should clearly set out the reason for selecting the preferred plan to confirm that there is not the potential for less damaging solutions. While Annex 12 lists the Constrained Options, and Appendix I provides the Constrained Options Assessments, the full unconstrained options list has not been presented alongside the SEA and no commentary has been provided in the report on the outcomes of the screening process or why some options were not taken forward. The EA would expect the full list of alternatives considered by Southern Water and justification for selection/not being taken forward should be provided to ensure compliance with the SEA regulations.	The SEA Regulations (Regulation 16(4)) require the Post Adoption Statement to present the reasons for choosing the preferred plan in light of the reasonable alternatives. Therefore, in line with the SEA Regulations this information will be presented at this stage. In line with regulatory requirements the SEA identifies, describes and evaluates the likely significant effects of reasonable alternatives. The Environmental Report explains in Section 4.4.3 that, "*For the purposes of this SEA, the constrained options will be considered as reasonable alternatives to the revised preferred options (that comprise the preferred plan)*". While the unconstrained options are referred to within the Environmental Report, they are not considered reasonable alternatives as they are not all feasible with a realistic prospect of being delivered. It is not the role of the SEA to present all the findings for screening of options and reasons for the selection and rejection of individual schemes. A full list of rejected options excluded from the plan is provided in Annex 12 of the fdWRMP24.

Reference	Comment	Response
Issue 29	Regarding our advice for improvement on SEA Scope, the EA acknowledges that detail provided within Section 4.2 to identify that 'all SEA topics identified by Schedule 2 of the SEA Regulations' have been scoped in for assessment to provide a comprehensive basis to identify, describe and evaluate the likely significant effects arising from the construction and operation of the water resource management options reflecting the wide ranging Sandown nature of the plan and baseline evidence and key issues identified. There is no explanation within Section 4.2 as to how the scoping consultation influenced the scope of the SEA; therefore the EA advise that this should be added or cross reference where this consideration is shown (e.g. Appendix B). The EA also note that while Section 4.2.3 and Table 4.1 of the Environmental Report presents the information on the temporal scope of the SEA in relation to definitions of the 'short,' 'medium' or 'long term' effects. The Environmental Report does not provide confidence that the full timeframe of the WRMP has been assessed. This may mean that not all effects of the plan have been assessed. As a result, this may reduce the effectiveness of the plan and pose a major risk to the environment. Southern Water should review and update this section in its revised draft plan.	Noted, a sub-heading has now been included on consultation in Section 4.2 with a cross-reference provided to the relevant Appendices. The SEA process has identified, described and evaluated all constrained options in Chapter 5 of the Environmental Report that are selected up to AMP17 across the nine situations in the BVP. As a result, the full timeframe/ plan period of the WRMP24 has been considered across all situations.
Issue 30	The EA asked Southern Water to cover a broader range of measures than just construction and monitoring for the adversely impacting schemes. The EA reviewed Southern Water response and noted that limited opportunities for environmental enhancements or benefits at a project or operational level have not been identified; which could be identified within Section 8. The EA understand and acknowledge that specific measures required to address significant effects identified by the assessment are included within Appendix G, H and I; and that this linked to SEA objectives within the Environment Report. Section 5.8 provides a summary of significant effects identified. This section identifies that 'Where residual significant	Noted, where possible the assessments of schemes in Chapter 5 (summarised from Appendix K) have sought to identify mitigation and enhancement measures. At a strategic level of plan-making and assessment, it is challenging to identify specific opportunities for enhancement given the information available. The mitigation measures identified through the assessment of schemes (summarised in Chapter 5 and detail in Appendix K) and set out in Chapter 7 are considered proportionate given the information available at this stage and strategic

Reference	Comment	Response
	negative effects have been identified, additional mitigation measures to those identified might have to be explored in order to try and reduce the scale and/or impacts of these effects, or alternative options explored'. There is a risk as the Environmental Report does not appear to commit to reducing significant negative effects. The EA expect Southern Water to improve this and include further mitigation measures to reduce the risks of these side effects. Where Significant effects are still being identified with mitigation in place, the EA would like Southern Water to take further mitigation to avoid this. The EA also noted that only high-level information has been provided on how mitigation will be secured (e.g. Construction Environmental Management Plan or implemented through EIA and planning process). Southern Water should include further detail around this in its revised draft plan.	nature of the WRMP24 and its accompanying SEA process. At this strategic level of plan-making and given the current information available, it is not possible to identify the mitigation measures necessary to reduce the significance of some residual negative effects. When further information becomes available, either through work on the detailed design of the scheme or accompanying evidence base studies, it is likely that additional mitigation measures can be identified and the significance of the residual effect reduced. This would be explored in detail through the project level assessments (EIA, HRA and WFD etc) that would accompany any planning applications.
Issue 31	Southern Water provided Section 4 that identifies the approach to assessing Secondary, Cumulative and Synergistic Environmental Effects. Table 6-1 sets out the likely cumulative effects (post mitigation) associated with the preferred programme of options as a whole by SEA Topic and Objective. However, not all significant residual effects are identified in the cumulative effects assessment for all topics, with some only noting if there is anticipated to be a cumulative effect without reference to the significance of the effect (e.g. Sections 6.2 and 6.6). It would be good if Southern Water can provide this further information. In regard to the cumulative effects with other relevant plans, programmes and projects with other water companies, Southern Water need to justify and explain a clear approach and consider all SEA topics to be included as well as Biodiversity (HRA) and water bodies (WFD) assessment.	Noted, Chapter 6 has been updated to reflect any changes to the WRMP24 as well as to clarify the significance of residual effects. The approach to the consideration of inter-plan cumulative effects through the SEA process is set out in Sections 4.4.2 and 6.6. The findings of the in-combination assessments carried out through the HRA and WFD were also included in Section 6.6. Further to this, it should also be noted that a cumulative effects assessment was also carried out at the regional level through the SEA process for WRSE's Revised Draft Regional Plan.

Reference	Comment	Response
	The EA asked Southern Water to provide further details about when the measures will be carried out, by who and how clear information on Table 9-1 of the environmental report. This monitoring section (9.5) does not appear to have been updated as suggested within the Water Company responses (Appendix D of the Environment Report). Further detail within Table 9-1 on what monitoring will be undertaken, when it would be undertaken (e.g. during construction), and how, would improve this section. There is no information on trigger points and what action will be taken if unexpected significant effects are found during monitoring. Measures should outline the need for triggers and thresholds for remedial action. Further consideration should be given to measuring other objectives of the plan such as delivering biodiversity net gain and improvements in ecosystem services. The Environmental Report should set out all of the information required by the regulations, including how any unforeseen adverse effects will be remedied, using specific and measurable indicators. Risk of challenge/objection on SEA regulations compliance grounds and failure to give sufficient weight to the arrangements for monitoring, may result in unforeseen adverse effects continuing without appropriate remedial action.	Noted, Section 9.5 has now been updated to provide further information where possible. It should be noted that Annex 21 accompanying the fdWRMP24 sets out the proposed monitoring plan in detail, including trigger points, to ensure that the adaptive plan is monitored and updated regularly, and action is taken in timely manner to course correct if needed.

The table below sets out the comments received from the Environment Agency in response to the SEA Environmental Report published for consultation in 2024 and provides a response as to how they have been addressed.

Topic	Comment	Response
Sea tankering	There is a potentially significant disease risk posed by potential organism or pathogen introductions including Gydrodactylus salaris (Salmon fluke) which is present or has recently been present in Norwegian catchments but is not present in the UK. Notably, following treatment Norwegian rivers have known to become reinfected. The supporting environmental assessments and mitigation measures outlined in SWS's plan have a number of weaknesses and as presented, are not adequate to avoid or mitigate this risk. Within the Annex 17 SEA assessment, there is insufficient consideration of the risks posed by INNS. We consider that the general 'Biodiversity' SEA objective should be upgraded in its assessment from 'moderately negative' to 'Major/Significant Negative' with respect to 'Operational' effects of this option. We do not agree with the Annex 18 HRA appropriate assessment assessed 'low risk' to Itchen SAC salmon. This understates the importance of the lower Test to supporting the Itchen SAC salmon interest featu e. The EA's position on the risk of Itchen SAC salmon is set out in previous advice to SWS relating to the Test Drought Permit. The HRA fails to consider a number of dispersal vectors, and it is not considered that the risk of transmission from the outlined temporary pipeline route has been fully assessed. The EA believes that the Test Little Lake is hydrologically connected to the River Test directly, and via Testwood Lakes, in exceptional floods. It is also ecologically connected to both water bodies - a range of animals move between Test Little Lake	After careful consideration, taking into account consultation feedback, further evidence and discussion with regulators, SWS decided to withdraw Bulk import (HRZ): Sea Tankering (45Ml/d) from its WRMP24. This decision reflects SWS's commitment to the communities it serves and the environment. During consultation on the rdWRMP24 significant concerns were raised by respondents about the potential impact of the option on the UK's fish farming industry, wild salmon populations and local aquatic life, due to thh threat of Gyrodactylus salaris (Gs). Gs is classified as Non-Native Invasive Species and its introduction could have potentially significant ecological consequences. Currently, there are no proven methodologies to guarantee that water transferred via sea tankering would be free of Gs. Recognising the severity of this risk, SWS accepts the possibility of introducing Gs poses an unacceptable risk. Furthermore, the logistical challenges associated with the option are significant. These include the procurement of services and obtaining planning permission for pipeline construction through environmentally sensitive areas. Given these challenges and the extended timelines re uired, which could potentially lead to considerable disruption, SWS decided it is prudent to consider more sustainable alternatives. However recognising the potential of sea tankering as an emergency drought water supply option, SWS are committed to conducting further feasibility studies to

Topic	Comment	Response
	and the adjacent Testwood Lakes and River Test. Human transfer via fishing equip ent must also be assessed, as well as the potential event that the temporary pipe, which runs alongside the river, were to burst or become disconnected at a junction. SWS's SEA assessment considers risks of transfer of salmon fluke but does not consider the risk of spread of the fluke out with Southampton Water, for instance from Test Little Lake itself. Survival can occur up to 20 ppt for 12 to 42 hours dependent on temperature. Furthermore, salinities can be significantly reduced down to Dock Head during high flows. Therefore, we believe that the risk of spread via fish migrating through brackish water becomes a possible dispersal vector. Mitigation measures do not c rrently consider dosing raw water with appropriate chemicals before arrival in the UK to eliminate the risk. Mitigation for INNS/pathogens would ideally be undertaken at source to remove risk of accidental spread. The EA has a position statement detailing how we propose to consider risks of INNS spread via water transfer. This legal policy position is titled as "Managing the risk of spread of Invasive Non-Native Species through raw water transfers"- The EA Position Statement, published April 2022. The poli y details that the transfers from hydrologically isolated locations are treated differently from transfers from already connected locations. The EA recognises it would be appropriate to consider this option an example of a transfer linking hydrologically isolated catchments. The position for such proposals is that: "New schemes that create a hydrological connection between locations not already connected will be required to have mitigation measures in place to ensure INNS cannot be	mitigate risks associated with water transfer. These studies will help to inform WRMP29 and will consider whether sea tankering could be viable if the water was sourced from the UK.

Topic	Comment	Response
	spread by any new transfers". This EA response follows consultation with NE, APHA, CEFAS as well as EA national and area INNS specialists.	
Sea tankering	Section 1.3.1 of the Annex 17 SEA Environmental Report identifies that the study area/geographical area under consideration covers ‘source of bulk water supply imports that serve these WRZ’s, but which lie outside SWS's boundaries. However, the source of supply in Norway for the Norway tankering option is absent from within this study area, despite being a source of bulk water supply. It is important that the boundary covers all the options considered for the plan and the area likely to be affected.	Please see above comment regarding removal of the sea tankering option.
Sea tankering	SWS has not described the baseline at the source of supply in Norway for example, the presence of designated habitats and protected species. The emphasis should be on relevance to the options being considered and does not need to list every aspect of the environment but should focus on those elements that are relevant. Not possible currently to assess if the option is likely to affect the conservation status of a designated site or will the option affect local air quality. If this is not identified appropriately the protection and status of the environment will at risk.	Please see above comment regarding removal of the sea tankering option.
Sea tankering	Relevant (international, national, and regional level) policies, legislation, plans, and programmes considering the scope of the Norway tankering option have not been included within the Environmental Report. As the plan has the potential for trans-national boundary implications, it should have regard to any relevant legislation and policy in the neighbouring nation.	Please see above comment regarding removal of the sea tankering option.

Topic	Comment	Response
	The emphasis should be on relevance to the options being considered and does not need to list every piece of environmental legislation or pol cy but should focus on those elements that are relevant. SWS is required to investigate this option against relevant policy and legislations to ensure it is aligned with international policies	
Sea tankering	SWS has explained how the options appraisal for targeted options has been conducted in Annex 20 Resilience Options. However, this is not explained clearly or in detail in the Annex 17 SEA report. Further information needs to be provided in the SEA report about how the sea tankering option has been considered within the wider Plan development process, and the SEA process. Further information needs to be provided on how consultation bodies have been consulted on the new Norway sea tankering option and included within the Environmental Report. This new option is not mentioned in the WRMP24 development section (e.g. 1.4.3). Therefore, it is difficult to understand where these options have come from and why they are now included. This is not explained within Section 1.4.5 ‘Changes from the dWRMP24’ (changes since September 2023).	The resilience options were subject to the same methodology and level of assessment through the SEA process as other options. This is demonstrated by the inclusion of the resilience options alongside all other options within Chapter 5 (Assessment of rdWRMP24) and Appendix K (Preferred Options Assessment) of the Environmental Report. Chapter 1 in the Environmental Report will be updated to make it clear that the resilience options are also included within the plan and the reasons for their inclusion. Please see above comment regarding removal of the sea tankering option.
(NC) and (BNG) assessments	SWS has not provided any Natural Capital (NC) or Biodiversity Net Gain (BNG) reports, either as a separate appendix to the rdWRMP or the Annex 17 SEA report. Natural Capital is considered qualitatively in Appendix H (preferred options assessment tables) of the SEA, but it does not fully meet the EA's expectations. In the rdWRMP, Natural Capital and Biodiversity Net Gain are stated as key metrics within the best value plan objectives, thus are included in the Regional Water Resources South East (WRSE) inveetment model which influences decision making.	Noted, a separate BNG and NC Report will be produced that presents the findings of the assessment of the preferred options carried out by WRSE and explains how the outcomes informed decision-making.

Topic	Comment	Response
	The planning tables include the WRSE appraisal of all options including natural capital and BNG metrics. However, no SWS-specific detailed and stand-alone methodology, reporting or interpretation and analysis is provided at the water company level. There is limited evidence and information provided on Biodiversity Net Gain in the main narrative. There is also not enough detail provided regarding how 10 percent Biodiversity Net Gain is planned to be achieved. Lack of clarity in the methodology used and no evidence for how NC or BNG assessment were conducted appropriately. Lack of explanation of how these metrics have been incorporated in the best value planning decision- making. Lack of explanation and detail around BNG requirement and potential risk to the environment.	
SEA updates drought permits and orders in Central area	Annex 17 Strategic Environmental Assessment (SEA) Environmental Report, Table 5-5 Visual evaluation matrix summary (post mitigation) for SNZ - Sussex North (SNZ) WRZ Option North (SNZ) Drought option: Pulborough Surface water (Phases 1 to 3) Drought Permit/Order (2025 onwards) (23Ml/d) is shown as having only a Moderately negative impact on Biodiversity. The EA considers that the risks are much greater – depriving the environment of that volume of water in the prevailing conditions that trigger its use, ii likely to be significantly negative. Potential that risks to the environment have been understated	The assessment of this option was informed by available information at the time and this included the Environmental Assessment Report for that option produced as part of the Drought Plan. At the time informed by the EAR, the SEA found that the Drought option is likely to have a moderate adverse effect on biodiversity. The EAR and HRA for the Pulborough drought option are currently being updated, hence any revised outcomes are not available for inclusion here, but will be shared with regulators once they have been finalised later this year.
SEA and HRA updates - River Arun in-	In SWS's Annex 17 SEA Environmental Report and Annex 18 Habitats Regulations Assessment, there are several options with potential to negatively affect biodiversity in the River Arun in its own right, irrespective of further risks to the suite of Habitats sites.	Noted, the cumulative effects assessment presented in Chapter 6 of Annex 17 SEA Environmental Report and the in-combination assessment in Annex 18 HRA Report will be updated to ensure that the interactions

Topic	Comment	Response
combination and cumulative effects	The options are: Groundwater (SNZ): Reinstate West Chiltington 3.1Ml/d, Petersfield 1.6Ml/d, Horsham WTW with storage at Pulborough 6.8Ml/d, and Petworth 4Ml/d). The SEA and HRA inadequately address the in- combination effect. The assessment does not explicitly assess the effects of the options together i.e. a combined loss of 4.7Ml/d to the River Arun in low flows and risks to in-stream biodiversity in low flow events.	between these options and potential for cumulative/ in combination effects on the River Arun are reflected.
Outline of the reasons for selecting the reasonable alternatives	Section 4.4.3 of the environmental assessment report sets out the approach to feasible alternatives, which has focused on the Least Cost Plan, and Best Value Environment and Societal Plan. The assessment summary within Section 8.5 identifies that there are no differences in terms of significant (major) effects identified between the Best Value Plan (BVP) and the alternative plans (Least Cost Plan (LCP), and Best Value Environment and Societal Plan (BESP). However, there are some differences in effects (significant) between the options (such as on Water SEA Objective during construction and operation for Sussex Hastings WRZ (e.g. 'WRZ Recycling (SHZ): Hastings WTW to Darwell Reservoir (9.5Ml/d) is selected under the BESP in 2067 and not selected under the Southern Water's LCP (SLCP) and BVP. As a result, the likely significant effects associated with this option will therefore not be realised under SLCP and BVP. This includes a residual major negative effect identified for the Water SEA objective during operation'). This Summary should be reviewed and updated to reflect the assessment. While Appendix I provides the Constrained Options Assessments and the full unconstrained options list has not been presented alongside the SEA. This limits the clear evidence and justification of the appropriate assessment and selection of options.	Noted, Chapter 8, Section 8.5 in the SEA Environmental Report (Annex 17) will be updated to ensure that this along with any other differences in terms of significant effects between the alternative programmes are highlighted. The SEA Regulations require the Environmental Report provides an outline of the reasons for selecting the alternatives dealt with, and this information is provided in Chapter 8. Section 8.2 outlines the reasonable alternative programmes selected for assessment and also explains how the findings of the SEA, including other environmental assessments informed decision making (the WRSE multi-criteria optimisation and Best Value Plan objectives, criteria and metrics). It is not considered necessary to provide a full list of unconstrained options within the SEA Environmental Report as all reasonable alternatives have already been set out in line with requirements. For further details on the unconstrained options, please refer to Annex 12 (Options appraisal Report).

Topic	Comment	Response
Clear scope for the SEA	The scope of the SEA, an appropriate study area and baseline for Sea tankering option Section 4.2.3. of the Environmental Report has classified effects in three categories: a short-term duration of up to 1 year, a medium-term duration from 1 to 5 years, and a long-term duration of beyond 5 years which has been informed by the 5-year cycle of review. The Environmental Report does not explicitly indicate the temporal scope of the SEA, and therefore we cannot be confident that the full timeframe of the plan has been assessed. This may mean that not all effects of the plan have been assessed. A a result, this may reduce the effectiveness of the plan. This should be reviewed and updated. Section 5.3. presents the assessment findings for each of the Preferred Supply Options, however, there is no indication to the timeframe for each of the effects. Section 3.2 does not reflect all issues detailed in Appendix G. For example, nutrient neutrality which is a key issue identified in the Biodiversity, Fauna and Flora section of Appendix G is not referenced.	As stated, Section 4.2.3 of the SEA Environmental Report sets out the timescales for the duration of likely effects considered through the SEA for the rdWRMP24. This reflects an intention to capture the differences that could arise at different timescales, consistent with the requirements of Schedule 1 (2)(a) of the SEA Regulations where the assessment of the effects should have regard to “the probability, duration, frequency and reversibility of the effects”. The SEA also sets out that the assessment conniders both the construction and operational phase effects for each option assessed. The SEA is therefore linked to the expected delivery of the WRMP24, based on the level of detail available to the strategic assessment. It is confirmed that the SEA has evaluated the likely significant effects for the full timeframe of the plan. Section 3.2 (key issues and opportunities) will be reviewed and updated where necessary to ensure that all the key issues identified in Appendix G (Environmental Baseline) are included.
Measures to address LSE lack enough mitigation and monitoring	Monitoring and trigger points in the environmental assessment report In review of SWS's revised draft plan the EA asked SWS to provide further details about when the measures will be carried out, by who and how clear information on Table 9-1 of the Environmental Report. To provide information on the trigger points and actions, considerations for delivering Biodiversity Net Gain (BNG). This information has not been provided in the revised draft WRMP24. There is no information on trigger points and what action will be taken if unexpected significant effects are found during m nitoring.	Section 9.5 and Table 9-1 will be updated to reflect the frequency of monitoring and the phase during it would be carried out (during construction or operation). Some of the proposed monitoring indicators are not specifically related to a phase of an option and would be reviewed annually. it is not considered necessary to repeat the monitoring measures and trigger points for drought options as these are set out as part of the Drought Plan. A reference to this will be provided in Section 9.5.

Topic	Comment	Response
	Potential risks to the environment. Further clarification and explanation are required. Risk of challenge/objection on SEA regulations compliance grounds and failure to give sufficient weight to the arrangements for monitoring, may result in unforeseen adverse effects continuing without appropriate remedial action.	
Outline of the content and main objectives of the WRMP	The SEA and WRMP objectives compatibility matrix presented in Table 5-1 is only broken down into four broad categories and not the relevant WRMP sub objectives. This means that it is not clear whether the overall judgements on compatibility with the SEA objectives apply to all or just some of these. For example, the environmental and social benefits category includes both biodiversity net gain/natural capital enhancement and abstraction reduction in volume terms which are very different. This could be improved (by covering all relevant WRMP sub objectives to increase understanding of the plan) but is unlikely to present a significant issue of compliance with the SEA regulations.	The current compatibility analysis is considered sufficient to explore the relationship between the WRMP24 objectives and the SEA objectives.
In-combination and cumulative effects	In-combination and cumulative effects The inter project cumulative effects are addressed in Section 6.4, including by reference to a broad range of local and regional plans, however the analysis is very high level. Limited detail as to how cumulative effects with other relevant plans, programmes and projects have been assessed and limited justification to support the conclusions that cumulative effects are unlikely. Not all significant residual effects have been identified in this cumulative effect assessment. The cumulative assessment considers NSIPs, however, some consented major projects in South East England may have been missed (e.g. Manston Airport and Slough Multifuel Extension Project).	The cumulative effect assessment presented in Section 6.4 of the SEA Environmental Report is considered to be proportionate and aligned with the strategic nature, content and detail of the plan being evaluated. Section 6.4 will be updated to reflect the current list of NSIPs and indicate if any significant cumulative effects are likely.

Topic	Comment	Response
	Significant residual effects from Nationally Significant Infrastructure Projects (NSIPs) have not been identified in the cumulative effects assessment. Lack of detailed assessment and clear justification; could potentially pose risks to the environment.	
Mitigation	Offsetting significant impacts via options mitigation measures The assessment within Section 5 and 6 of the environmental assessment report, assumes the implementation of standard industry best practice methods. It also assumes any defined mitigation measures such that the significance of effects relates to the residual effects. Further details on mitigation are provided within the Annex 17 SEA Appendix K and L of the SWS's plan. Mitigation has not been identified for all options resulting in potential significant effects. Potential significant residual effects remain in some cases without sufficient further actions offered. Section 7 outlines mitigation for some topics, however these are construction focused and there is a heavy reliance on a Construction Environmental Management Plan (CEMP) as the main mechanism to minimise identified environmental impacts. The company has not fully incorporated impact avoidance or minimisation of effects into the options development or further planning process. This should cover a broader range of measures than just construction and monitoring.	Noted, Chapter 7 (Mitigation) of the SEA Environmental Report will be revised to more clearly present the residual significant effects identified for individual options and then suggest further mitigation measures where possible or highlight uncertainties to indicate where further assessment is required. This will primarily be focused on the options proposed in the first ten year of the plan period, i.e. AMP 8 and 9. If it is not possible to set out mitigation measures at this stage this will be clearly explained and then a recommendation made to explore mitigation measures at the project level or alternative options through WRMP29.
The assessments for the alternative options	Section 4.4.3 of the environmental assessment report sets out the approach to feasible alternatives, which has focused on the Least Cost Plan, and Best Value Environment and Societal Plan. The assessment summary within Section 8.5 identifies that there are no differences in terms of significant (major) effects identified between the Best Value Plan (BVP) and the alternative plans (Least Cost Plan (LCP), and Best Value Environment and Societal Plan (BESP).	Noted, Chapter 8, Section 8.5 in the SEA Environmental Report (Annex 17) will be updated to ensure that this along with any other differences in terms of significant effects between the alternative programmes is highlighted. The SEA Regulations require the Environmental Report provides an outline of the reasons for selecting the alternatives dealt with, and this information is provided in Chapter 8. Section 8.2 outlines the reasonable

Topic	Comment	Response
	However, there are some differences in effects (significant) between the options (such as on Water SEA Objective during construction and operation for Sussex Hastings WRZ (e.g. 'WRZ Recycling (SHZ): Hastings WTW to Darwell Reservoir (9.5Ml/) is selected under the BESP in 2067 and not selected under the Southern Water's LCP (SLCP) and BVP. As a result, the likely significant effects associated with this option will therefore not be realised under SLCP and BVP. This includes a residual major negative effect identified for the Water SEA objective during operation'). This Summary should be reviewed and updated to reflect the assessment. While Appendix I provides the Constrained Options Assessments, the full unconstrained options list has not been presented alongside the SEA. The full list of alternatives considered and justification for selection/not being taken forward should be provided.	alternative programmes selected for assessment and also explains how t e findings of the SEA, including other environmental assessments informed decision making (the WRSE multi-criteria optimisation and Best Value Plan objectives, criteria and metrics). It is not considered necessary to provide a full list of unconstrained options within the SEA Environmental Report as all reasonable alternatives have already been set out in line with requirements. For further details on the unconstrained options, please refer to Annex 12 (Options Appraisal Report).
	SEA weighting is not sufficient The SEA assessment in general gives insufficient weight to environmental impacts. For example, Drought option: TUBs - SNZ: the impact on society of implementing this option is rated as Moderately Negative, but the benefit for biodiversity is rated as only Minor Positive. The assessment process in general over-rates impacts of demand measures on society in comparison to environmental benefits accrued.	The SEA does not attribute different weights to the SEA objectives. The methodology is presented in Chapter 4 of the SEA Environmental Report and the definitions of significance are provided in Appendix H. Professional judgement was applied to score the options using the guidance in Appendix H and available evidence at the time of the assessment. The approach used is in line with the methodology developed by WRSE to ensure a consistent assessment across the regional plan area.
	Environmental Effect – Norway SEA Regulations require the Environmental Report to describe the likely significant effects on the environment.	Please see above comment regarding removal of the sea tankering option.

Topic	Comment	Response
	The Sea tankering option from Norway is not covered within the Environmental Reports study area, and the likely significant effect of the location in Norway is not clearly identified in that report. The EA would like to better understand how these have been considered. Further explanation and justification are required to minimise any potential impact to the environment	
	Environmental Effect – Inconsistency Annex 17 SEA Appendix K and Table 5-32 in the Environmental Report identify that the Norway tankering option 'would be deployed with the possibility of supply being increased to 180 Ml/d within two years.' It should be clear what available water supply has been assessed for this option (45 or 180 Ml/d). There is a potential that the environmental impact has been underestimated if the assessment has not considered the full scope of this option. Appendix L 'Summary of Post Mitigation Significant Effects by W ter Resource Zone Options' identifies the Norway tankering option would have a significant adverse impact on Biodiversity during construction. This is not reflected within Table 5-33 or other sections (e.g. Section 5.8) of the Environmental Report. This should be reviewed. Appendix K provides the preferred options assessment. This is not consistent with effects identified within the main Environmental Report. For example, Appendix K identifies that the Norway tankering option would have a moderate negative effect during operation for Climatic factors, whereas this in identified as minor within the Environmental Report. Further explanation and justification are required to minimise any potential impact to the environment	Please see above comment regarding removal of the sea tankering option.

Topic	Comment	Response
	Environmental Effect Annex 18A Addendum to the HRA suggests that there is some uncertainty relating to the residual effects of the Norway tankering option. This uncertainty is not reflected within the Environmental Report assessment of this option.	Please see above comment regarding removal of the sea tankering option.
	Biodiversity It is understood that NE are being consulted on the biodiversity impacts of this options, particularly considering the identified impacts on the SPA, Ramsar, and SAC. There is no indication to the timeframe for each of the effects. The assessment should be updated to consider and provide this information.	Please see above comment regarding removal of the sea tankering option.
	Water It is noted that the tankered water would be discharged to a lake near the Test surface water WSW. The different origin and chemistry of this water and the potential resulting adverse effect on this lake and the species using it (spread of pollution, sediment, and disease) does not appear to have been considered.	Please see above comment regarding removal of the sea tankering option.
	Air The assessment within Appendix K states 'No effects on air quality are anticipated as a result of operation of the option.' Has this considered the impacts on Air Quality from shipping emissions and the emissions form power generate to pump water (which is likely to be an energy intensive process). There is no indication to the timeframe for each of the effects. The assessment should be updated to consider and provide this information.	Please see above comment regarding removal of the sea tankering option.

Topic	Comment	Response
	Climatic factors The assessment within Appendix K states 'No carbon data available.' This uncertainty does not appear to be reflected within the Environmental Report assessment of this option (aligning with the assessment methodology outlined in Section 4.4.1). There is no indication to the timeframe for each of the effects. The assessment should be updated to consider and provide this information.	Please see above comment regarding removal of the sea tankering option.
	Population and human health The Environmental Report identifies that this Norway tankering option would not have any effect on human health (e.g. noise or air quality), however, the assessment has identified temporary moderation negative effects on Air Quality during construction of this option, and that access to public open space may be disrupted during the construction phase. Understand that this option could operate for 12 weeks, plus 6 – 8 weeks for each installation and decommissioning every 2 to 3 years. This assessment may b perceived to underestimate this effect on Human Health. There is no indication to the timeframe for each of the effects. The assessment should be updated to consider and provide this information.	Please see above comment regarding removal of the sea tankering option.
	Material Use The assessment of this option identifies that it would not result in any effects on material assets. The Assessment Definitions of Significance within Appendix H identifies that a negative effect would results from an option resulting in an increase in energy consumption with no renewable energy. This assessment may be perceived to underestimate this effect considering the operational energy consumption associated with shipping and pumping water (which is likely to be an energy intensive process).	Please see above comment regarding removal of the sea tankering option.

Topic	Comment	Response
	There is no indication to the timeframe for each of the effects. The assessment should be updated to consider and provide this information.	
Romsey GW	Groundwater (HRZ): Feasibility of new boreholes at Romsey (4.8Ml/d) The narrative suggested that this scheme will involve drilling new boreholes at some distance from the original source. There is a need for more detailed information, specifically about the location of the new boreholes for this source. The location of these new boreholes is important - if they are drilled at a large distance from the source (and off the confined chalk) it is unlikely they would not be classed as part of the existing source at Romsey, as impacts on the environment would be at a different l cation. This may then require a new licence. The EA has a policy against issuing new consumptive licences on the Chalk. Any new boreholes would still need to be assessed on their impact on the environment. Annex 17 SEA Appendix K - There is a comment on Page 146 (PDF) for Kings Somborne> Water >Protect and enhance the quality of the water environment and water resources which also applies to this abstraction. Changes to the baseflow to the River Test are possible from these changes and possibly impact on other rivers depending on the location of the ew boreholes. The implication of this is that an increase in recent actual abstraction within licence limits may affect the water balance of the river Test Chalk and have an influence on the flows in the River Test.	The precise location of the boreholes is not known at this stage; however, the initial scoping for the option envisages that the new boreholes would aim to remain within circa 250m of the existing WSW compound and within regions where the chalk is confined by the Lambeth Group. Maintaining close proximity to the existing WSW site would be a key driver, though also aiming to maintain c. 200m lateral distance between new boreholes. As well as optimising outputs, the additional need is to undertake a gradual nd managed reduction in output from the old well and adit system (due to asset life). The assessment of the option was informed by the WFD assessment, which found, *"Increase in recent actual abstraction within licence limits may affect the water balance of the River Test Chalk, and have an influence on flows in the River Test. The ALS shows there is restricted water available at Q95, with water available at Q70, Q50, Q30. Changes to the hydrological regime, water quality, river continuity and morphological conditions due to change in baseflow could impact fish and invertebrate populations. However, restricted water availability applies only further downstream, and is protected by a HOF. Therefore, local flow changes, within existing licence, should be acceptable and downstream impacts avoided by HOF (and potentially associated reduction in other sources)"*. The assessment in Appendix K will be

Topic	Comment	Response
		updated to also include the last sentence from the WFD assessment that is quoted above.
River Adur Offline Reservoir (up to 19.5Ml/d by 2045)	River Adur Offline Reservoir (19.5Ml/d) SEA assessment and HRA Annex 17 Strategic Environmental Assessment (SEA) Environmental Report, Table 5-5 Visual evaluation matrix summary (post mitigation) for SNZ - River Adur option Storage (SNZ): River Adur Offline Reservoir (19.5Ml/d) is shown as Minor positive impact on biodiversity, whereas the EA considers that, depending upon exact location, design, and management, it could offer valuable new habitat for biodiversity. This option may thus be undervalued in the SEA (this assumes that the reservoir is filled in high flows nd not in low flow conditions). There is insufficient detail presented regarding this option to enable proper assessment in the SEA and HRA. Abstraction of up to 30Ml/d from the River Adur may be acceptable in high flows, but not in low flow conditions or at certain times of the year. Thus, the option appears both sound – storage is a sound concept to secure resilience when river flows are low – but also could be environmentally harmful without key operational constraints. Potential that the SEA undervalues this option with respect to im act on biodiversity. The absence of technical detail in this option leads to limited confidence in the environmental assessment, and therefore the EA flags this as a high-risk option.	The assessment in Appendix K for this option identified a minor residual positive effect during the operation phase as a result of new habitat creation. Based on this and other comments, the assessment will be revisited to determine if the positive effects identified are of greater significance. The assessment in Appendix K for this option was informed by the WFD assessment and concluded a residual moderate negative effect against the SEA objective relating to protecting and enhancing the quality of the water environment and water resources. The assessment will be revisted and informed by any updates to the WFD assessment to determine if the residual negative effects identified are of increased significance.

The table below sets out the comments received from Natural England in response to the SEA Environmental Report published for consultation in 2024 and provides a response as to how they have been addressed.

Topic	Comment	Response
SEA scoping and in-combination assessment	Natural England was consulted on Southern Water's SEA scoping as part of the WRSE regional plan SEA scoping. Natural England advised Southern Water in a letter dated 15th March 2022 (responded to in Appendix B of the SEA) that the WRSE scoping should not be solely relied upon and that the company would need to consult with Natural England and other relevant regulators separately as per the legal requirements (set out in Annex 2). We then reviewed the SEA as part of the 2022/2023 dWRMP consultation. Natural England have concerns about the SEA screening and conclusions which are highlighted below: • The SEA screening for biodiversity have not taken a precautionary enough approach, please refer to section 1.2.4 of this letter for further details on specific options. In addition, Natural England also have the following comments on the SEA in-combination / cumulative assessment: • The cumulative assessment in section 6.2.1, table 6.1 must also consider the cumulative impacts to the River Test Compensatory SAC habitat. • The SEA Environmental Report includes information on Southern Water's Drought Plan and the Environment Agency National Drought Plan (sections 6.4.2 and 6.4.3), indicating these have been assessed. However, it is not clear as to whether other water company Drought Plans have been considered in-combination within the environmental assessments. Natural England acknowledge that Southern Water have stated "assessment of cumulative effects of the rdWRMP24 with the Southern Water Drought Plan, other water compa y WRMPs and Drought Plans" within the SEA Environmental Report, but where this has been considered remains unclear. Furthermore, Natural	Noted, please refer to the responses provided below on each of the issues raised.

Topic	Comment	Response
	England also have concerns about the mitigation proposed for options where a significant effect has been highlighted: • For options pre 2035 where a significant negative effect has been identified, more detail on potential/appropriate mitigation must be provided due to the timescale of these schemes within the plan. This is particularly important for those options where a significant negative effect is likely following mitigation, as detailed within Appendix L (Post-mitigation significant effects), namely Groundwater (HRZ): Remove constraints at King's Sombourne (2.5 ML/d) and Drought Option - Supply Side (HSW): Sea Tankering from Norway (45 ML/d).	
Issues not addressed from the previous consultation response: Environment Plan	Natural England previously advised Southern Water that the SEA of the dWRMP should consider the targets set out in Defra's 25-year Environment Plan, along with those recently published within the Environment Act 2021, covering the aspirations of the Government's Environmental Improvement Plan. It was also advised that, for any options within the plan where actions could be implemented to assist Southern Water in delivering on these targets, clear detail should be provided within the SEA, this does not appear to have been actioned. Natural England acknowledge that Southern Water have made reference to considering the forementioned plans and legislation within the development of the rdWRMP (as detailed within Table 2.1, SEA Environmental Report), however, it is not clearly stated where the relevant plans, policies or programmes have been considered, and to how, or which options proposed within the rdWRMP will help to deliver against the associated targets.	Defra's 25-year Environment Plan and the Environment Act 2021 are considered through the review of plans and programmes presented in Appendix F of the SEA Environmental Report. The level of detail contained in the plans and programmes review is proportionate and in line with the strategic nature of the plan, the requirements of the SEA Regulations and extant guidance. It is not the purpose of the SEA Environmental Report to set out how the WRMP24, or individual options, will help to deliver targets set out in the 25-Year Environment Plan and the Environment Act 2021.
Issues not addressed from the previous consultation response:	Natural England also acknowledges that Southern Water have provided an overview of designations within its operational catchment, including both nationally and locally important wildlife sites, as detailed within Annex 17 (Appendix G, Environmental Baseline). However, Natural England's previous advice surrounding the assessment of these sites within the SEA, does not appear to have been actioned. There remains	Noted. The scope of the SEA includes all topics identified by the SEA regulations (Schedule 2(6)) to ensure all likely significant effects have been identified, described and evaluated. The approach provides a comprehensive and inclusive approach to considering the effects of proposed options, aligned with WRSE

Topic	Comment	Response
Environment Plan	to be no “clear section” within the SEA surrounding SSSI’s, nor is it obvious which SSSI’s, or other non-habitat sites (NNR, LNR, etc.) have been assessed and which of the proposed strategic resource options are likely to impact these sites or their associated features. This should be clearly identifiable within the SEA Environment Report, along with details provided relating to options which will help to enhance SSSI resilience or improve site condition. Furthermore, there appears to be no reference to any relevant, site specific conservation or monitoring targets such as those described within the Favourable Condition Tables (FCT’s), available for each SSSI.	requirements and consistent with government, regulator and sector guidance. This includes effects on biodiversity, flora and fauna, which are assessed against the SEA objective ‘Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)’. This has ensured that the likely significant effects on SSSIs have been identified, described and evaluated as demonstrated within the individual constrained and preferred option assessments contained in Appendix I and K, with potentially affected SSSIs and SSSI risk zones named and potential effects described. Where relevant to the description of likely significant effects of the WRMP24 by Water Resource Zone, these are summarised in Section 5 of the SEA Environmental Report and where relevant to the assessment of cumulative effects, are also summarised in Section 6 (concerning the interaction between options). Consistent with the requirements of Schedule 2 (6) of the SEA Regulations, the likely significant effects on the full range of issues listed has been presented by SEA topic/objective, and not by specific designated/non-designated sites, features and/or receptors. The approach is comprehensive, compliant, consistent with government and sector guidance and avoids any unintended perception of partiality or preference in the presentation of likely significant effects.
Issues not addressed from the previous	Similar to the issues detailed above regarding SSSI assessment within the SEA, the assessment of MCZ’s against proposed options in this rdWRMP also seems to be lacking clarity, creating a degree of uncertainty about whether these sites have been accurately assessed.	Noted, likely significant effects on MCZs has been taken into consideration and this is demonstrated within Appendix K and the main SEA Environmental Report. The main SEA Environmental Report identifies that there is the potential for a residual significant negative

Topic	Comment	Response
consultation response: Environment Plan	The MCZ's assessed as part of the environmental assessment should be clearly defined against each of the potentially impacting proposed options within the SEA Environmental Report, and conclusions made with consideration to the conservation objectives for each site. Furthermore, there appears to be inconsistencies in the detail between documents within the SEA, for example, for strategic resource option: Desalination (KNE) Isle of Sheppey (10 ML/d) Phase 2, the Medway Estuary MCZ is detailed for likely significant effect during construction and operation within Appendix K (preferred options assessment), however, this has not been mentioned within the main SEA Environmental Report.	effect on biodiversity and references some of the key receptors. This information will be reviewed to ensure that all key receptors are flagged and consistent with the assessment in Appendix K.
Issues not addressed from the previous consultation response: Environment Plan	Whilst protected landscapes have been identified within the SEA, Natural England previously advised Southern Water that the rdWRMP should include a Protected Landscapes Mitigation Strategy to ensure, where possible, that protected landscapes within Southern Water's operational catchment where protected, particularly where multiple options have the potential to impact these sites over the plan period. This does not appear to have been included within this rdWRMP, and as such, it remains unclear as to whether the generic mitigation proposed within the SEA is suitable to alleviate the identified impacts within Southern Water's plan or other water companies plans where the same protected landscapes may be impacted. The level of mitigation detail provided, particularly for schemes with proposed delivery pre-2035, and where a negative effect has been identified is minimal. For example, Groundwater (HRZ): New Boreholes at Romsey (4.8 ML/d) is predicted to have residual operation effects against the landscape SEA objective, however, no specific details are provided about the mitigation measures which can be implemented to remove or minimise this impact, only "best practice will be implemented to avoid negative effects" is noted. As this is an option included early in the plan period (2030-31), a more detailed assessment must be provided. This is similar to other options within the plan, such as Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5 ML/d).	Section 7.2.8 of the Environmental Report sets out the approach to mitigation for effects on cultural heritage and landscape. This includes reference to a Protected Landscapes Mitigation Strategy. Neither of the options referred to fall within or are in close proximity to a protected landscape. Minor residual negative effects are identified during the operation phase as a result of the need for new infrastructure. The mitigation measures proposed, including screening, will help to ensure that residual effects are minor and not significant. Further mitigation can be explored at the project level that could reduce the significance of any residual effects further or remove it entirely.

Topic	Comment	Response
SSSIs in the SEA	Section 1.2.1 of this letter details some of the issues that have not been addressed since the previous consultation, Natural England also have the following comments on the SEA regarding SSSI assessments: Section 5.4.3 of the SEA details the Groundwater (SBZ): Lewes Road (3.5 ML/d) option as having a Moderate Negative impact against the Water Quality SEA objective due to concerns over groundwater levels and availability within the Brighton Chalk Block. However, this details the operational effects from this option as having a Neutral impact against the Water Resilience SEA objective. Therefore, the two conclusions appear contradictory, especially when taking into consideration the assessment criteria detailed under the Deliver reliable and resilient water supplies questions within Table 4-2 (pages 56-59, SEA Environmental Report). Similar conclusions have also been made within Section 5.4.1 for option Groundwater (SNZ): New Borehole at Petworth (4 ML/d), relating to concerns over the sustainability of the L wer Greensand Arun and Western Streams waterbody. Section 5.5.3 of the SEA outlines the impacts of the Sandown water recycling scheme and the SSSI that would be affected, this however does not appear to consider the impact on both construction and operation of the pipeline that crosses Alverstone Marshes SSSI. Two other SSSIs are listed but this one is not so it remains unclear whether this has been considered.	The detailed assessment of these options presented in Appendix K of the SEA Environmental Report demonstrates that the moderate residual negative effect, relates to the findings of the WFD assessment and potential impacts on water levels and availability against the SEA objective relating to protecting and enhancing the quality of the water environment and water resources. The neutral effect on the SEA objective related to increasing resilience to, and reducing, flood risk, reflects that these options woull not be situated in an area prone to flooding and that they would not increase flood risk. Both of the options noted in this comment have been assessed as having a minor positive effect on the SEA objective related to the delivery of reliable and resilient water supplies. However, the assessments for these options will be re-visited to ensure that the they are in line with the methodology and consistent. The assessment for the Sandown water recycling option in Appendix K will be re-visited to ensure that it takes into account all relevant SSSIs. However, it is noted that the assessment in Appendix K does refer to Alverstone Marshes SSSI risk zones; however, it does not highlight that the option potentially overlaps with the SSSI so this will be checked and clarified and the assessment findings updated if necessary.
Biodiversity in the SEA	New schemes such as the new Romsey boreholes, remove constraints at Kings Sombourne, West Chiltington and Petersfield are still subject to environmental investigations, so it is unclear how these have been assessed as neutral for biodiversity at this stage. Whilst the	Noted, a review will be carried out to ensure that the findings of the assessments set out in Appendix K are consistent with the summary findings presented in Chapter 5 of the SEA Environmental Report. As part of this, the assessment for these options will be re-visited to ensure a precautionary approach has been taken

Topic	Comment	Response
	environmental assessments are still ongoing a more precautionary approach must be taken. In Section 5.5.5 of the SEA, it states “T2ST Option B and T2ST Option C no significant positive effects (or positive effects of any kind) or significant negative effects were identified during the assessment of the construction phase”. A lot of uncertainty remains about the impacts of this scheme to designated sites with it interacting with numerous designated areas, a precautionary approach must be taken with the screening. The River Test Compensatory SAC habitat must also be considered as part of the scr ening. Table 5.32 of the SEA has screened the construction impacts of the Sea Tankering option as minor negative impacts; it is unclear with the information provided how this has been concluded. This is contradictory to the conclusion provided for this scheme in Appendix L (Post-mitigation significant effects) which details a significant negative effect following mitigation and during the construction of this option. The pipeline for this scheme crosses a high designated and sensitive area, with mudflats and saltmarsh present which are vulnerable to collapse. Natural England would consider the impact as a Major/Significant Negative Effect with the information currently presented for this scheme. The impacts on salmon if salmon fluke were to be brought over with this transported water would constitute a Major/Significant Negative Effect alone. The SEA screening conclusions for this option must be reviewed	that reflects the revised findings of the HRA and WFD assessment and the understanding that further assessments are being carried out. The assessment of the T2ST Options B and C concluded no residual positive effects during the construction phase; however, a number of residual negative effects were identified during the construction phase in recognition of uncertainties and in line with a precautionary approach. Please see the response to the Environment Agency’s comments regarding removal of the sea tankering option.
Species recovery and protected species	Natural England acknowledge that Southern Water have provided some high-level information relating to priority habitats and protected species (SEA, Appendix G), along with some generic information on mitigation measures (section 7.2, SEA Environmental Report). However, there does not appear to be a great level of options, or site-specific detail relating to protected species or the potential level of impact from proposed options within the SEA. This is particularly concerning for options that are set for	Under the Biodiversity, flora and fauna SEA objective “Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)” and supporting 12 guide questions, the assessment includes consideration of enhancing biodiversity and species with assessment guide questions referring to (amongst other things): “Are there any opportunities for

Topic	Comment	Response
	delivery early on the plan (pre-2035). Whilst it is assumed that this will be accurately assessed at a project level, early consideration of protected species should be undertaken and noted within the environmental assessments as this will help to determine the severity of impacts from proposals and help to identify whether options can be deemed environmentally viable.	habitat creation or restoration? Will the option contribute to the loss or gain in habitat connectivity? Is there potential for contribution to achieving 'favourable' conservation status or for creation of new habitats and species "of principal importance for the purpose of conserving biodiversity" covered under Section 41 (England) of the NERC Act (2006)?" A proportionate approach has been taken for the assessment that reflects the strategic nature and detail available in the WRMP24 and for options.
Climate change in the SEA	Our previous comments on climate change have not been addressed and we do not agree with the response in the Statement of Response, the comments from our previous consultation response are listed below for clarity: • The SEA has included a climatic objective, but this objective is society focused, rather than wildlife resilience focused. Natural England strongly advises that the assessment of WRMP options considers their impacts on nature in light of climate change and assess whether the options would hinder wildlife adaptation and/ or resilience to environmental changes. The impacts from climate change are covered and referenced in Appendix E (Environmental baseline), however, more clarity is required to understand hether this has been fully considered when assessing impacts of each option. • Beyond what has been considered during the option selection stages conducted by WRSE for future environmental scenarios and reduction of abstractions, there does not seem to have been explicit consideration to assess how much water is needed to support nature- based solutions in the SEA. Reference to the England peat action plan should be made for	As stated previously, the SEA provides a proportionate assessment of the WRMP24 covering a comprehensive range of effects, consistent with those identified in Schedule 2(6) of the SEA regulations and anticipated for water resource proposals. This includes effects on biodiversity, flora and fauna, which are assessed against the SEA objective 'Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)' and supported by a range of assessment questions. including whether 'the option enables or reduces the potential of water dependent wildlife to adapt to climate change?'. Further to this, the objective relating to reducing vulnerability to climate change risks and hazards includes assessment questions that relate to resilience and adaptation, including if the option contains climate resilience measures and if it will create catchment resilience to drought. Both of these are indirectly linked to the resilience of biodiversity to adapt to climate change impacts.

Topic	Comment	Response
	sites it is deemed necessary to wet peat to help achieve the objectives of the sit and meet the targets outlined in the peat action plan. It is acknowledged that Southern Water have included climate change risks within the supply/ demand forecasting and to support improving resilience into the future. However, this approach does not appear to be fully considering the environmental risks / impacts to designated sites and the wider biodiversity. This is evident as the above issues still apply.	The SEA provides a proportionate assessment of the WRMP24 covering a comprehensive range of effects, consistent with those identified in Schedule 2(6) of the SEA regulations and anticipated for water resource proposals. This includes effects on biodiversity, flora and fauna, which are assessed against the SEA objective 'Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)' and supported by a range of assessment questions. including whether 'the option enables or reduces the potential of water dependent wildlife to adapt to climate change?'. Further to this, best value planning criteria and metrics relating to SEA, Natural Capital, BNG and resilience were used to inform decision-making.
Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d) (new in rdWRMP)	Limited information has been provided for this option to date, further details on the location of the new borehole is needed. Natural England notes the conclusion of the River Test CSMG flow study around this option and that this has been screened in the HRA for the River Test Compensatory SAC habitat. However, further discussions on this option and any associated impacts to the River Test are needed, a meeting should be held with Natural England and the Environment Agency to consider this further. The SEA screening for this option currently seems to underestimate the impacts on biodiversity, as assessed as neutral, with the environmental assessments still ongoing a more precautionary approach must be taken.	This option does not propose the delivery of any new boreholes. For clarity, the Kings Sombourne scheme was newly introduced into the WRMP, it was consulted on in 2024 but it will utilise and improve the condition and yield of the existing boreholes. Noted, the assessment for this option will be re-visited/ revised where necessary to ensure a precautionary approach has been taken in relation to residual effects, which takes into account the ongoing assessment work being carried out and the revised findings of the HRA and WFD assessment. However, it should be noted that the WFD assessment concludes the option is WFD compliant.
Bulk import (HRZ): Sea Tankering	Limited details have been provided for this option in relation to the pipeline from Southampton Docks to Testwood Little Lakes. The HRA has concluded that this option will not have an adverse effect on the Solent	Please see the response to the Environment Agency's comments regarding removal of the sea tankering option.

Topic	Comment	Response
(45Ml/d) (new in rdWRMP)	designated sites or interest features of the River Itchen SAC. With the information currently available and the uncertainties that remain it is unclear how this is the case. In the workshop held with environmental regulators on the 22nd March 2024, Southern Water informed the attendees that this scheme would likely need to go to stages 3 and 4 (IROPI) of the HRA process, it is unclear what has materially changed since that conclusion was made. Natural England notes the full HRA has been undertaken since this workshop, but further clarity on why the conclusion has changed has not been provided to Natural England. To conclude, with the information currently presented and the details provided surrounding this option during regulator meetings for this scheme, Natural England would not agree with the connclusions for the following designated sites: the Solent and Southampton Water SPA/Ramsar, the Solent Maritime SAC, the Solent and Dorset Coast SPA and the River Itchen SAC. Like the Environment Agency, Natural England also share the concerns held on the transfer of INNS, especially salmon fluke, which could have an adverse effect on the integrity of the Itchen salmon population. The water from the Little Lake interacts with the River Test via flood events, etc so introducing salmon fluke into the Test catchment via this route or any other would constitute an adverse effect (as well as being a risk to salmon populations more broadly). Natural England notes that Southern Water are considering the risks of this further. However, this has not been appropriately considered in the rdWRMP to date and the risks of this are downplayed. Due to the timelines associated with this option, the HRA must be updated and / or a clear and committed programme provided to address the issues raised regarding this option. Natural England currently have concerns about the SEA screening conclusions for this option, with the screening including minor negative impact on biodiversity. Natural England would not agree with this conclusion, please refer to section 1.2.4 of this letter for further details.	

Topic	Comment	Response
Groundwater: Romsey - new BHs (4.8Ml/d)	Natural England notes the current conclusion of the CSMG flow study on the Test regarding these abstractions but currently uncertainty remains due to the lack of detail and the ongoing WFD no deterioration investigations. Further consideration and discussion of this option is also needed in light of the River Test Compensatory SAC habitat, Natural England notes the HRA addendum did screen in this site for this option. The SEA screening for this option currently seems to underestimate the impacts on biodive sity, as assessed as neutral. With the environmental assessments still ongoing a more precautionary approach must be taken. Whilst this option proposes to operate within the headroom of existing licences, as this is a change to current usage the assessment must determine whether this will lead to potential impacts to protected sites or priority habitats. Natural England note the operational date change from 2042 to 2031.	The assessment of the option was informed by the WFD assessment, which found, "Increase in recent actual abstraction within licence limits may affect the water balance of the River Test Chalk, and have an influence on flows in the River Test. The ALS shows there is restricted water available at Q95, with water available at Q70, Q50, Q30. Changes to the hydrological regime, water quality, river continuity and morphological conditions due to change in baseflow could impact fish and invertebrate populations. However, restricted water availability applies only further downstream, and is protected by a HOF. Therefore, local flow changes, within existing licence, should be acceptable and downstream impacts avoided by HOF (and potentially associated reduction in other sources)". The assessment will in Appendix K will be updated to also include the last sentenced from the WFD assessment that is quoted above.
Groundwater (SNZ): Petersfield refurbishment (1.6Ml/d) and Groundwater (SNZ): Reinstate West Chiltington (3.1Ml/d) (WRMP19 options reassessed	Natural England acknowledges the updated assessment of this option within the HRA addendum, however, believes that with the information currently provided, there is not enough evidence to provide certainty of no unavoidable adverse effects in-combination with other WRMP options or Southern Water's drought option, as detailed within Section 1.1.3 of this letter. Furthermore, the SEA screening for this option currently seems to underestimate the impacts on biodiversity, as assessed as neutral, with the environmental assessments still ongoing a more precautionary approach must be taken.	Noted, the cumulative effects assessment presented in Chapter 6 of Annex 17 SEA Environmental Report and the in-combination assessment in Annex 18 HRA Report will be updated to ensure that the interactions between these options and potential for cumulative/ in combination effects on the River Arun are reflected. The assessments for these options in Appendix K of the SEA Environmental Report will be re-visited to reflect this comment and updated evidence (including HRA and WFD assessments) where necessary.

Topic	Comment	Response
in the rdWRMP)		
Recycling: Horsham WTW conjunctive use with Arun Reservoir, Pulborough (6.8 ML/d)	There appears to be some inconsistencies surrounding the details of this option within the Technical Report, whereby, two different deployable output values have been stated (11.5 ML/d and 6.8 ML/d). There is no apparent explanation provided, as to explain the difference, this should be clarified and amended throughout the rdWRMP documentation. Appendix K (Preferred options assessment) of the SEA details a likely “direct impact” on ancient woodland throughout the construction of this option, however, details “reinstatement/compensation of habitats” as proposed mitigation. Natural England advise that this is not a suitable mitigation package for this habitat type and that ancient woodlands should be avoided wherever possible. Furthermore, it has been noted that the “rationale for conclusions” within the HRA screening for this option (Appendix D2) is mixed up between the Arun Valley SAC and SPA.	Noted, inconsistencies between these options within the environmental assessment reports will be addressed. The assessment of the option in Appendix K of the SEA Environmental Report is not directly stating that Ancient Woodland could be reinstated or compensated for; however, it is agreed that this should be made clearer and should state that this habitat should be avoided. Appendix E3 of Annex 18 will be revised to make clearer the screening rationale with respect to Arun Valley SAC and Arun Valley SPA and the Recycling (SNZ): Horsham WTW with storage at Pulborough (6.8Ml/d) option.
Desalination (SWZ): Tidal River Arun (10 ML/d)	Natural England acknowledges the change in name and yield (deployable output) of this option within this rdWRMP, as detailed within the HRA Addendum. However, also note that the change in deployable output has not been amended throughout the documentation and inconsistencies are present in what is stated, for example, the SEA Environmental Report (page 86) details two different deployable output’s (10 ML/d and 8.34 ML/d). Whilst it can be assumed that the difference is resulting from operational processes, this has not been clearly stated. There is also uncertainty as to whether the increased supply version, and modular aspect of this option: Desalination (SWS): Tidal River Arun (20 ML/d) and Desalination (SWZ): Tidal River Arun (20 ML/d) Phase 2, have been accurately assessed in relation to deployable output as no change in yield has been noted for these options. Furthermore, Natural England note that Kingsmere MCZ has been screened out in the SEA due to saline plumes not impacting the features of this site, namely Sea Bream.	Noted, inconsistencies relating to the yields for this option between the environmental assessment reports will be addressed. The assessment of this option through the SEA in Appendix K will be re-visited to provide further detail around potential impacts on Kingsmere MCZ.

Topic	Comment	Response
	Natural England do not agree with this conclusion as the interest feature is mobile and not solely restricted to the MCZ boundaries, further detail should be provided to demonstrate how this conclusion has been drawn.	
Bulk Import (SNZ): Havant Thicket Reservoir to Pulborough (50 ML/d)	There are some inconsistencies surrounding the deployable output for this option within the documentation, for example, the HRA Addendum (page 66) details two different deployable output's, 50 ML/d which appears consistent with the rest of the rdWRMP documentation and 40 ML/d. This should be clarified to ensure that water budget calculations have been adequately addressed. Furthermore, Appendix K of the SEA details several areas of Ancient Woodland along the proposed pipeline route (> 20 areas), however, it has not specifically been stated that these will be avoided (where possible) throughout the mitigation proposed. As this scheme is not due for implementation until later in the plan, appropriate pipeline design is expected at the project level. This will also be required to ensure appropriate measures are in place for pipelines crossing other priority habitats (i.e., Chalk Streams) and any residual negative operation or construction impacts (as detailed within The SEA matrix tables) are avoided where possible.	Noted, inconsistencies relating to the yields for this option between the environmental assessment reports has been addressed. The assessment of this option through the SEA in Appendix K will be re-visited to include reference to the avoidance of the Ancient Woodlands.
Treatment capacity (SWZ): Pulborough Winter Transfer Stage 1 (2 ML/d)	Natural England acknowledges that this option has been renamed within the rdWRMP and is no longer referenced as Transfer: Winter transfer stage 1 – Provision of a permanent sludge treatment facility at Pulborough WSW (2 ML/d). However, this change has not been clearly signposted within the documentation. The SEA has identified areas of ancient woodland along the proposed pipeline route, however, has not specifically mentioned that re-alignment of the route will be undertaken where possible to avoid impact n irreplaceable habitats such as ancient woodland. As this option is not due for delivery until later in the plan cycle, it is assumed that project level details and mitigation can be implemented in sufficient time. Natural	Noted, inconsistencies relating to the naming of this option between the environmental assessment reports will be addressed. The assessments of these options through the SEA in Appendix K will be re-visited to include reference to the avoidance of the Ancient Woodlands.

Topic	Comment	Response
	England would advise engaging with us early on this option as to ensure any potential negative effect can be avoided. The same issues have been identified for option: Bulk Import (SNZ): SEW RZ5 to Pulborough (10 ML/d), previously noted as Tilmore to Pulborough (10 ML/d).	
Interzonal transfer (SNZ – SWZ): Pulborough to Worthing	Natural England acknowledges that this option has been renamed within the rdWRMP and is no longer referenced as Pulborough to Worthing (30 ML/d). However, this change has not been clearly signposted within the documentation. Furthermore, there appears to be some inconsistences within the detail of this option between the HRA Addendum and SEA Environmental Report, whereby, two different deployable outputs have been stated (34 ML/d and 29.21 ML/d). This should be clarified and amended for consistency throughout the documentation.	Noted, inconsistencies relating to the naming and yields of this option between the environmental assessment reports has been addressed.
Groundwater (SNZ): New borehole at Petworth (4 ML/d)	Natural England acknowledges that this option has changed name between previous consultations and is no longer referenced as Groundwater: Petworth WSW return to service with a new borehole (4.0 ML/d). However, this has not been signposted within the rdWRMP documentation. Natural England also acknowledge that the environmental assessment conclusions of this option are now aligned between the HRA and SEA, following the previous consultation. Natural England, do however, have concerns regarding the conclusions drawn from these environmental assessments. The SEA Environmental Report (Page 82) states a significant negative effect against the Water - Quality SEA Objective due to potential WFD non-compliance and considerable adverse effect on groundwater flow from abstraction of the underlying aquifer. The SEA matrix summary table (Table 5-5, page 78, SEA Environmental Report) details a positive operation effect against the Water - Reliability SEA Objective, this appears to be contradictory against the Significant and negative impact of operation against the Water - Quality SEA objective (as previously detailed). Annex 17 (Appendix K, page 14) details minor negative residual operation effects against the	Noted, inconsistencies relating to the naming this option between the environmental assessment reports will be addressed. The assessment of this option within Appendix K will be re-visited to reflect this comment and consistency with the HRA and WFD assessments will be reviewed where necessary.

Topic	Comment	Response
	Biodiversity SEA objective, despite detailing that significant effects are avoidable with best practice mitigation. It is unclear from the SEA what the residual operational effects are and where impacts are likely to be. Furthermore, Moderate Negative effects at the operational stage post-mitigation are detailed (page 15, SEA Environmental Report) with significant uncertainty regarding the level of impact to groundwater and surface flows (WFD non-compliance) and interaction with GWDTE's located above the underlying aquifer. This is further supported by minor negative effects against the Climatic Factors - Reduce Vulnerability SEA Objective, detailing that "increased abstraction may reduce the water sources resilience to potential drought scenarios". Despite this, the SEA matrix tables do not provide any detail regarding the proposed mitigation/monitoring that will be required to determine if this option is environmentally viable. As this option has now been proposed as an accelerated scheme within the rdWRMP, a more detailed assessment of what is required to ensure adverse effects are avoided must be provided.	
Recycling: Sittingbourne industrial reuse (7.5Mld)	Limited details have been provided for this option. Natural England notes the comments made in section 5.3 of the HRA addendum on the uncertainties around the freshwater flow to Milton creek and potential impacts to the Swale SPA/Ramsar. Based on the current information provided, the level of uncertainty over the impacts for this scheme and the potential for an adverse effect, a precautionary approach must be taken and stage 3 of the Habitats Regulations considered for this option. As noted above Natural England has had no engagement on this option from the Southern Water project team and this scheme is due for delivery in 2031. This should be progressed as a matter of urgency to avoid delays to the delivery of this project.	The Sittingbourne Industrial Water Reuse option was included in Southern Water's WRMP19 and accordingly engagement was completed in 2019. The WRMP HRA recognises where minor uncertainty remains regarding the effect this option may have upon Habitats sites, and where further project level investigation is required to increase confidence in the conclusion of no adverse effects upon integrity. The assessment is necessarily precautionary in the absence of baseline survey data at this stage, however, it is both unlikely that habitat directly affected by changes to non-saline flow represents functionally linked land, and that environmental changes in this location would affect the suitability of habitat for qualifying species. The WRMP HRA has been updated accordingly.

Topic	Comment	Response
Recycling (SHZ): Hastings WTW to Darwell Reservoir (15.3 ML/d)	There appears to be some inconsistencies within the details for this option throughout the documentation, relating to both option name and proposed deployable output. The HRA and Technical Report detail the scheme correctly (as named above), however, the SEA Environmental Report details the scheme as having two different names: Hastings WTW to Darwell Reservoir and Hastings to Darwell, along with two different deployable output's (9.5 ML/d and 15.3 ML/d). These should be checked and amended throughout the documentation to ensure consistency.	Noted, inconsistencies relating to the naming this option between the environmental assessment reports will be addressed.
Recycling: Tunbridge Wells WTW conjunctive use with Bewl reservoir (3.6Ml/d)	Further to the inconsistencies with the naming of this option, there also appears to differences between the predicted environmental impact between documents within the SEA (SEA Environmental Report and Appendix K), this should be checked to ensure consistency. Section 5.6.4 of the SEA Environmental Report which details the environmental assessments of options wholly within the WRZ includes very little information regarding the impacts of this option and only refers to "moderate negative effects on the health and wellbeing and tourism and recreation SEA objectives". It is also noted that this statement is detailed within the text under the option name Recycling (SHZ): Tunbridge Wells with Bewl (3.6 ML/d), however, the option detailed within the relevant SEA matrix table (Table 5-47) is Recycling (SHZ): Tonbridge to Bewl (5.7 ML/d).	Noted, inconsistencies relating to the naming this option, yields and likely significant effects will be addressed.
Recycling (KMW): Medway WTW to Lake (14 ML/d)	Natural England acknowledge the change in deployable output for this option as noted within the Technical Report and the amendment to the option name in response to this alteration. Natural England have provided some comments on this option within Section 1.1.2 of this letter. However, would like to note that the impact conclusions drawn within the HRA (Appendix G), appear to use the previous deployable output for its calculations. This should be recalculated and amended within the documentation to show the difference in non-saline inputs, relative to flow.	The assessment for the Recycling (KMW): Medway WTW to Lake (14 ML/d) will be updated to reflect the revised deployable output, and WRMP HRA (Appendix G) updated accordingly.

Topic	Comment	Response
Desalination (KTZ): East Thanet	Natural England have provided some comments regarding the HRA for the option Desalination (KTZ): East Thanet (20 ML/d) within section 1.1.2 of this letter. Natural England acknowledges that this forms part of a larger, modular scheme, noted within the Technical Report as Desalination (KTZ): East Thanet (20 ML/d) and Desalination (KTZ): East Thanet (20 ML/d) Phase 2, collectively providing up to 40 ML/d deployable output. However, it remains unclear within the HRA assessment whether this option has been reviewed as the 20 or 40 ML/d option. Natural England note that in Table 5.17 of the HRA, it is stated “operation of the East Thanet desalination options (construction effects will only occur once, in relation to the outfall), which will necessarily operate additively (i.e. the initial 20Ml/d plant will be supplemented a second plant)”, indicating that this has been considered within the in-combination assessment, although as no deployable output is noted for this option within the HRA, it remains unclear as to whether the larger supply option (i.e., increasing the volume of treated discharge) has been considered throughout. Natural England acknowledge that there remains to be some uncertainties regarding the potential level of impact from this, and other desalination options both solely and in-combination, and agree that some uncertainty will remain until project level detail can be provided	The WRMP HRA and appendices will be reviewed to ensure that all naming is consistent, and cross references checked to include consistent reporting and assessment of deployable output.
Raising Bewl Reservoir 0.4m (3Ml/d)	Natural England previously raised concerns regarding the SEA assessment for this option and was not in agreement with Southern Water’s conclusion that the construction phase would result in only minor negative impacts due to the locality of this option intersecting with several areas of ancient woodland. Whilst Natural England acknowledge that this has now been rectified within the SEA to show a moderate negative effect on the biodiversity SEA objective during construction (pre-mitigation), Natural England believe that there has been insufficient consideration to the landscapes identified and the proposed mitigation. This still lacks any specific detail or acknowledgement that ancient	Noted, the assessment of this option will be revisited in Appendix K of the SEA Environmental Report to ensure that it recommends the avoidance of Ancient Woodland and further landscape mitigation where possible.

Topic	Comment	Response
	woodland is a non-compensatory habitat due to the timescales in which it takes for these habitats to form.	
Bulk transfers	Natural England acknowledges the existing transfers/imports which are detailed within the HRA (pages 14-16) and as such, note that these are not assessed further due to forming part of the baseline. Natural England also acknowledge that new transfers/imports have been noted throughout the documentation, including the SEA, HRA and Technical Report, and have also been put through appropriate assessments. However, it has also been noted that there remains to be several inconsistencies within the detail for several of these options, this should be rectified throughout the rdWRMP documentation. This includes the following: • Bulk Export (SHZ): SEW RZ8 to RYE (5.56 ML/d, 2075) – the HRA Addendum states two deployable output's (10 ML/d and 7 ML/d) and details a different date of 2050. • Bulk Export (SHZ): Rye to SEW RZ8 (10 ML/d, 2050) - bi-directional transfer of above scheme. • Bulk Import (SBZ): SEW to Rottingdean (20 ML/d, 2066) – the SEA Environmental Report (page 97) states two deployable output's (20 ML/d and 10.42 ML/d). • Interzonal Transfer (HAZ-HKZ): Andover to Kingsclere Bi-Directional (10 ML/d, 2050) – the SEA Environmental Report (page 112) states two deployable output's (10 ML/d and 6.68 ML/d). • Interzonal Transfer (HSE-HSW): Yew Hill WSW to River Test WSW Bi-Directional (60 ML/d, 2031) – the SEA Environmental Report (page 150) states two deployable output's (60 ML/d and 58 ML/d). • Interzonal Transfer (KTZ-KME): Utilise Full Existing Transfer Capacity (9 ML/d, 2040) – the SEA Environmental Report (page 161) states two deployable output's (9 ML/d and 2.88 ML/d).	The WRMP HRA and appendices have been reviewed to ensure that all naming is consistent, and cross references checked to include consistent reporting and assessment of deployable output.

Topic	Comment	Response
	• Interzonal Transfer (KME-KTZ): KME-KTZ Bi-Directional (15.8 ML/d, 2026) – the SEA Environmental Report (page 180) states two deployable output's (15.8 ML/d and 11.22 ML/d).	

The table below sets out the comments received from Historic England in response to the SEA Environmental Report published for consultation in 2024 and provides a response as to how they have been addressed.

Topic	Comment	Response
	The Strategic Environmental Assessment (SEA) offers a further, important opportunity to embed key principles. We encourage the SEA to be clearer in its approach to mitigation, adding detail to section 7.2.7 on direct and indirect heritage impacts. Currently the text states that potential adverse impacts on the settings of cultural heritage assets should be considered early in the design process and any adverse impacts minimised. But it does not mention direct impacts and it fails to state explicitly that Southern Water will seek to avoid harm before considering how to minimise unavoidable harm.	The assessment of options in Appendix K highlights where is the potential for options to have direct impacts on the historic environment, for example due to proximity of designated heritage assets, then recommends mitigation to reduce the significance of residual effects. Section 7.2.7. of the SEA Environmental Report will be updated to reflect this comment as follows: *"Reflecting the importance of avoiding harm to heritage significance, the potential for both direct and indirect adverse impacts on cultural heritage assets and their settings should be considered early in the design process and any adverse effects minimised, and where possible avoided, for example through micro-siting / alternative pipeline routes to avoid designated sites. Further measures, for consideration within the CEMP could include:"*
	Also, the summary on page 19 of the SEA is light on detail on mitigation measures and the importance of avoiding harm to heritage significance. Reference is made to avoiding impacts on setting, but not to avoiding impacts on the assets themselves. Reference is made to the use of archaeological watching briefs; however, that risks elevating a single approach to archaeology that is only appropriate in certain circumstances to a more widespread default (including those circumstances when a watching brief would be inappropriate).	The page referenced is in the Non-Technical Summary, further detail on mitigation is provided in Chapter 7 of the main report. Section 7.2.7. of the SEA Environmental Report will be updated to reflect the comment above as well as this comment and reference to archaeological watching briefs.
	We re-assert the point made in our consultation response in early 2023 about appropriate use of terminology. Archaeology is the study of archaeological remains, rather than the remains themselves. It would be	Noted, the SEA Environmental Report and appendices will be updated to reflect this comment.

Topic	Comment	Response
	better to refer to archaeological remains when that is meant and, aligning with national policy, to refer to heritage assets (which are defined in national policy) rather than historic assets (which are not).	

The table below sets out the comments received from Wildfish in response to the SEA Environmental Report published for consultation in 2024 and provides a response as to how they have been addressed.

Topic	Comment	Response
Abstraction from chalk streams	The Strategic Environmental Assessment (SEA), Habitats Regulations Assessment (HRA) and the Water Framework Directive (WFD) assessment are defective because they do not properly consider the impacts of, in particular, increased abstraction from the chalk streams and their aquifers.	The SEA, HRA and WFD assessments are considered to meet regulatory requirements and are in line with extant guidance.
Salmon metapopulation	The environmental assessments do not deal with the consequences of the EA's identification of a salmon metapopulation in the Test, Itchen and Meon.	The SEA evaluates the likely significant effects of the WRMP24 and reasonable alternatives against a range of different objectives, which are presented in Chapter 4, Section 4.3. One of these objectives relates to the protection and enhancement of biodiversity, priority species, vulnerable habitats and habitat connectivity.
Environmental Assessment	It must be remembered that SW take water from some of the most important chalk streams and rivers in England, as well as from the hydrologically-linked groundwaters that surround them. Any effects of such abstraction are therefore likely to have direct impacts on those waterbodies. It is worth repeating this as the technical documents dealing with environmental impacts underplay the chalk stream element as a minor consideration within the (over) 600 pages of analysis.	The WFD assessment considered each option in the WRMP24 to determine if they are compliant with the WFD objectives, taking account of flow sensitivity assigned by the Environment Agency. The findings of this work informed the SEA process.

Topic	Comment	Response
Environmental Assessment	It is explained at p 241 that, “Following evaluation, we selected 85 preferred supply options as well as 10 generic drought options and 16 demand management and leakage options for inclusion in our revised best value draft WRMP24 (rdWRMP24).” It is notable that “best value” is included here in the summary of the environmental assessment. Yet “best value” is not a determiner or a metric for environmental impact. Matters are further confused as what should be a high-level environmental impact assessment gives parity to supply-side and demand-side options.	As set out in Chapter 8 and Section 8.2 of the SEA Environmental Report, best value planning incorporates environmental considerations, which includes the outputs from the environmental assessments. All the different types of options have been assessed consistently using the methodology set out in Chapter 4 of the SEA Environmental Report.
Interconnectivity of Test, Itchen and Meon	We are extremely concerned that the environmental assessments presented with the WRMP treat the rivers Test and Itchen and the species they hold, including salmon, as distinct. The ecological interconnectivity of the rivers has been ignored in the assessments. That means in turn that the assessments contain huge information voids. That is certainly an important oversight.	The WFD assessment and HRA have assessed relevant features, species and designations, in line with their respective requirements. All options with the potential to affect river flow within the Test catchment have been assessed using CSMG flow standards, which have been defined by Natural England for application to European designated sites, and are consistent with those applied to the Itchen.
Salmon metapopulation	In the EA’s response to a WildFish query regarding metapopulations of 4 June 2024, the EA confirmed that: “Our decision to treat the Itchen, Test and Meon salmon population as a metapopulation is a recent one, and we are aware that a consequence is the need to apply the Habitats Regulations to those other rivers, possibly including the Solent too. Furthermore, we are aware that Natural England recommended to Defra that the Rivers Test and Meon be designated as SAC in their own right, for multiple interest features including Atlantic salmon. We are also aware that Natural England has informed both Southern Wate and Thames Water that they should treat the Test and Meon as designated.”	The WFD assessment and HRA, and consequently the SEA, have assessed relevant features, species and designations, in line with their respective requirements. All options with the potential to affect river flow within the Test catchment have been assessed using CSMG flow standards, which have been defined by Natural England for application to European designated sites, and are consistent with those applied to the Itchen. Those assessments take account of existing abstractions within the catchments.

Topic	Comment	Response
	Above all, this has consequences for the WRMP and the s 20 arrangements for drought conditions. For instance, the SEA assessment of the uptake of headroom within licences affecting the Test will need assessing under the Habitats Directive and Regulations in terms of the impacts on the common salmon population it shares with the Itchen; there will also need to be full assessments of the impacts of existing licences on all these rivers and those where the impacts occur on a secondary basis due to abstraction from groundwater affecting the water table and river flow in both rivers	
INNS risk	With the tankering of water from Norway, the receptor streams are at risk of pollution or the spread of disease and water-borne parasites. Assessment must be made on the basis of the interconnectivity of the rivers as habitats (not just the Test). Again, the SEA, HRA and WFD process ignore this crucial point and therefore reach invalid conclusions which downplay risk and potential adverse impacts. Without such assessment, the SEA and HRA/ WFD assessments are incomplete.	Please see the response to the Environment Agency's comments regarding removal of the sea tankering option.
	The 2024 SEA includes assessment of the more obvious water use / demand reduction measures, leakage reduction and the large-scale strategic proposals such as the reservoir and water recycling options. However, the SEA (which is structured around areas - Western, Central, Eastern - and WPZs) contains randomly-listed options, mixing up demand-reduction, increased abstraction, drought orders, large schemes and so on, into an undifferentiated list, rather than considering similar supply or demand options together.	Noted. The assessment findings are summarised by Water Resource Zone in Chapter 5 of the Environmental Report.
SEA Topics	[The SEA includes] a table of "Key issues" under various "topics", some of which are relevant to water resources and some of which are highly peripheral (e.g. "Soil", "Historic Environment", "Landscape") and	As set out in Section 4.2.1 of the Environmental report, the aim of SEA is to identify, describe and evaluate the likely significant effects of implementing the rdWRMP24 on the environment. Schedule 2 of the SEA Regulations require that the assessment includes

Topic	Comment	Response
	certainly not key pressures or topics for a WRMP with equal weighting to the environment. The headings are taken from Annex I of the SEA Directive. However, Annex I (f) is clearly a general, suggestive list. The Directive proffers potential thematic areas for a report including, ("f) the likely significant effects (1) on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above f ctors" [emphasis added]). Clearly, the choice of "topics" should be determined by context. Taking this list at face value means that it is easier to balance environmental harm against economic gain and to avoid proper scrutiny of the issues that matter – i.e. obvious consequences of removing too much water from groundwater or rivers. But it also leads to absurdities where an obvious environmental harm is also described as a positive gain.	information on the "*likely significant effects on the environment, including on issues such as: biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage, including architectural and archaeological heritage; landscape; and the inter-relationship between the issues referred to*". The key policy objectives identified from the review of other plans and programmes relevant to the assessment of the rdWRMP24 (Chapter 2) and the economic, social and environmental issues arising from the analysis of the baseline (Chapter 3), together with the characteristics of the water resource management options, have been used to define the scope of the assessment in terms of the topics set out in Schedule 2 of the SEA Regulations. In this instance, all SEA topics identified by Schedule 2 of the SEA Regulations have been scoped in for assessment to provide a comprehensive basis to identify, describe and evaluate the likely significant effects arising from the construction and operation of the water resource management options reflecting the wide ranging nature of the plan and baseline evidence and key issues identified.
SEA Topics	Population, as one such "topic", for instance, is defined by a list of issues that are not strictly relevant to assessing wider environmental impacts in an SEA: "The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water for health and wellbeing.	Noted, please refer to response above.

Topic	Comment	Response
	■ The need to ensure water supplies contribute to improvements in levels of health, particularly in urban areas and deprived areas. ■ The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other use such as agriculture."	
SEA Topics	Affordability is not an environmental issue. It is up to Ofwat and the water company to determine this separately from supply and resourcing. The inclusion of health and welfare components of an assessment (along with tourism and business) simply confuses and skews the outcome of the assessment.	Noted, please refer to response above.
SEA Topics	One assessment of a drought option for abstracting more water from the Itchen, for instance, under the heading "Population and Human Health", "the column headed "Significant effects identified", tells us that: "A significant positive effect has been identified, associated with the maintenance of public water supplies in drought conditions within the Hampshire Southampton East WRZ as follows: Drought option - supply side (HSE): Lower Itchen." But apart from the fact that it is obvious that more water is welcomed by profligate consumers, the whole point of the SEA is to assess environmental effects (which are in the main those adverse effects on the environment) not to perform a cost-benefit calculation where bi diversity is in the minority of topics. That is why using this method, it is unsurprising that the findings of the report are that there were 14 significant negative effects relating to non-essential use bans in respect of health and well-being, and yet there were only 11 negative effects on biodiversity found out of all the proposals (drought order measures and permits at Candover and the	The purpose of the SEA is not to perform a 'cost-benefit calculation between the objectives. The methodology used is presented in Chapter 4 and Appendix H of the SEA Environmental Report.

Topic	Comment	Response
	Itchen included). The take-up of headroom in existing licences did not feature in this list. It is very apparent that the options appraisals overwhelmingly class the impacts of measures including increased abstraction (by whatever form) as neutral. In the table of impacts, there are very few red-marked, significant negative biodiversity impacts (though there are some absurd positives for the same activities). We struggle to see how a drought option which restricts use could have serious “health and wellbeing” impacts.	
SEA Topics	Although “significant cumulative negative effects” are identified for the construction phase for biodiversity (which should really be the key topic), we are told that “the HRA concluded that no adverse effects on European site integrity are anticipated as a result of the options in combination” though there are some uncertainties with regard to desalinisation. It is extraordinary that with the renewed use of unused abstraction sources, further boreholes, anticipated use of drought permits and orders, that such a conclusion could follow. It may well be that this is the result of the mixing of advantages with impacts (e.g. the lumping together of real impacts on biodiversity which are underplayed and such positive scores as water “reliability” which in any calculation cannot be signals of environmental benefit).	Noted.
SEA Topics	Time and time again in the WRMP, an increase within licensed abstraction volumes is seen as having a neutral or minor impact for abstractions. That is because it appears to be assumed that licensed volume is the baseline for assessment, when that is clearly not the case.	Assessments of impact on river flows in the WFD Assessment take account of existing flow pressures, either from published Abstraction Licensing Strategies or, in preference, from recent and representative investigations/ modelling where it is available. The baseline for assessment is, as standard, assumed to be recent actual abstraction, and hence any increase in abstraction above recent actual is assessed for potential impact. The assessment approach also

Topic	Comment	Response
		includes assessment of the baseline (recent actual) flow pressures, and so take account of any situations where the baseline is already not meeting flow targets. Where WINEP investigations are ongoing and conclusions were not yet available at the time of producing the WRMP WFD assessment, precautionary conclusions have been drawn in the WRMP WFD assessments, recognising the potential for the WINEP investigation to conclude that overall catchment abstraction, or individual options, may be non-compliant with the WFD. These findings are carried through to the other assessments as appropriate.
SEA Topics	With Kings Sombourne, the drilling of a new borehole in order to increase the abstracted amount up to a licensable amount is not “neutral” and would presumably require a new licence or variation of the existing one and a proper detailed assessment of impact.	This option does not propose the delivery of any new boreholes, so concerns regarding potential licence amendment needs, due to relocating the source, would not be relevant. For clarity, the Kings Sombourne scheme was newly introduced into the WRMP, it was consulted on in 2024 but it will utilise and improve the condition and yield of the existing boreholes. It is not clear what objective this comment is referring to but it is assumed to be biodiversity. The assessment for this option in Appendix K was informed by the WFD assessment and HRA findings. The WFD (2024) assessment confirms WFD compliance (with low confidence) (on the basis of remaining within existing licence) and the HRA concluded that there are no pathways for operational impacts in relation to the National Site Network.

Topic	Comment	Response
	For the Chilbolton groundwater abstraction point in the headwaters of the Itchen, it is indicated that "Recommission Chilbolton (0.5Ml/d), has been assessed as having one moderate negative effect against the resource use SEA objective for the construction phase. Minor negative effects were also identified for this option against the biodiversity, soils, air, carbon emissions, landscape, historic environment, health and wellbeing, and tourism and recreation, SEA objectives."	Noted.
	As for operational effects, there were "No significant positive effects [. . .] identified during assessment of the four options for the operation phase." That being said, it is concluded counter-intuitively that "a range of minor positive effects were identified against the biodiversity, water quality, water reliability, carbon emissions, climate change, landscape, historic environment, health and wellbeing, and resource use SEA objectives"	Noted.
	With Candover/ lower Itchen, the abstraction in times of drought, there is some acknowledgment of impact but, again, that is skewed in the strange balance of impacts and advantages. The "demand side" reductions (NEUBS) in the form of drought options were negative in that they impacted "health and wellbeing", potential "loss of businesses".	The assessment considers the potential for both positive and negative effects against each SEA objective and for both construction and operation. This is considered appropriate as an option could have both positive and negative effects. The methodology used is presented in Chapter 4 of the SEA Environmental Report.
SEA, sea tankering and INNS risk	It is recorded that: "Sea tankering from Norway (45Ml/d) was identified as having a moderate negative effect against the biodiversity and carbon emissions SEA objective during the operational phase. . . "Moderate negative effects were also identified for Drought option - supply side (HSW): Sea tankering from Norway (45Ml/d) against the water resilience, air, landscape, historic environment and tourism and	Please see the response to the Environment Agency's comments regarding removal of the sea tankering option.

Topic	Comment	Response
	recreation SEA objectives. Minor negative effects were identified against water quality, carbon emissions, and material ssets SEA objectives. However, there are a number of unanswered questions regarding the unintended transportation of invasive species or parasites. It is not clear that this has been looked at properly. The possible impacts have been downplayed. With the large-scale measures, the potential impacts of construction phase are more obvious but dealt with more consistently than the other measures though not enough detail to assess impact of, for instance, tunnelling under protected rivers.	

Appendix F Review of Plans, Policies and Programmes

International/European

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Ramsar Convention - The Convention on Wetlands of International Importance (1971)	
The Convention on Wetlands of International Importance (Ramsar, Iran, 1971) (the "Ramsar Convention") is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories.	The impacts of the WRMP24 options on important wetland habitats must be considered as part of the SEA.
UNESCO (1972) Convention Concerning the Protection of the World Cultural and Natural Heritage	
The Convention defines the kind of natural or cultural sites which can be considered for inscription on the World Heritage List. In addition to this, countries are required to: • Ensure that measures are taken for the protection, conservation and presentation of cultural and natural heritage • Adopt a general policy that gives cultural and natural heritage a function in the life of the community • Integrate the protection of heritage into comprehensive planning programmes	The WRMP should seek to protect cultural heritage sites. The SEA assessment framework should include an objective on heritage and archaeological issues.
Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)	
The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal objectives are: • To conserve wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the co-operation of several States; • To promote such co-operation. Particular emphasis is given to endangered and vulnerable species, including endangered and vulnerable migratory species; • In order to achieve this the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species. Targets for Contracting Parties are:	The WRMP should take into account the habitats and species that have been identified under the Convention, and should include provision for the preservation, protection and improvement of the quality of the environment as appropriate. The SEA assessment framework should incorporate the conservation provisions of the Convention particularly the

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
• Promoting national policies for the conservation of wild flora, wild fauna and natural habitats, with particular attention to endangered and vulnerable species, especially endemic ones, and endangered habitats, in accordance with the provisions of this Convention; • Undertaking in its planning and development policies, and in its measures against pollution, to have regard to the conservation of wild flora and fauna; Promoting education and disseminating general information on the need to conserve species of wild flora and fauna and their habitats.	protection of wild flora, fauna and natural habitats.
Directive on the Conservation of Wild Birds (79/409/EEC) (as amended)	
The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. The main provisions of the Directive include: • The maintenance of the populations of all wild bird species across their natural range (Article 2) with the encouragement of various activities to that end (Article 3). • The identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4). (Together with Special Areas of Conservation designated under the Habitats Directive, SPAs form a network of European protected areas known as Natura 2000). • The establishment of a general scheme of protection for all wild birds (Article 5). • Restrictions on the sale and keeping of wild birds (Article 6). • Specification of the conditions under which hunting and falconry can be undertaken (Article 7). (Huntable species are listed on Annex II of the Directive). • Prohibition of large-scale non-selective means of bird killing (Article 8). • Procedures under which Member States may derogate from the provisions of Articles 5-8 (Article 9) — that is, the conditions under which permission may be given for otherwise prohibited activities. • Encouragement of certain forms of relevant research (Article 10 and Annex V). Requirements to ensure that introduction of non-native birds do not threatened other biodiversity (Article 11).	The WRMP should seek to protect and enhance biodiversity, particularly designated sites. The SEA assessment framework should include objectives, indicators and targets that cover biodiversity.
Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983)	
The Convention on the Conservation of Migratory Species of Wild Animals (also known as the Bonn Convention or CMS) is an intergovernmental	The WRMP should take into account the habitats and species that have been identified under this directive,

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
treaty under the United Nations Environment Programme. The convention was signed in 1979 ratified in the UK in 1985. The convention aims to ensure contracting parties work together to conserve terrestrial, marine and avian migratory species and their habitats (on a global scale) by providing strict protection for endangered migratory species. Overarching objectives set for the Parties are: • Should promote, co-operate in and support research relating to migratory species; • Shall endeavour to provide immediate protection for migratory species; • Shall endeavour to conclude Agreements covering the conservation and management of migratory species included in Appendix II. Setting targets is the responsibility of member states.	and should include provision for their protection, preservation and improvement. The SEA assessment framework should include biodiversity, incorporating the importance of conserving migratory species.
The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention) (1985)	
This sets the framework for the approach to conservation across Europe.	The SEA should take into account the need to conserve heritage
The Nitrates Directive (91/676/EEC)	
This directive aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices.	This directive aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices.
Urban Wastewater Treatment Directive (91/271/EEC)	
The aim of the Urban Waste Water Directive is to protect the environment from the adverse effects of waste water discharges. It sets out guidelines and legislation for the collection, treatment and discharge of urban waste water. The Directive was adopted by member states in May 1991 and is transposed into law in England and Wales by The Urban Waste Water Treatment (England & Wales) Regulations 1994 (as amended*). The Regulations require that all significant discharges are treated to at least secondary treatment. They also set standards and deadlines for the provision of sewage systems, the treatment of sewage according to the size of the community served by the sewage treatment works and the sensitivity of receiving waters to their discharges.	The WRMP will need to reflect the guidelines and legislation set out in the directive. The SEA assessment framework should include water quality.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Convention on Biological Diversity (1992)	
The main objectives are: Conservation of biological diversity; Sustainable use of its components; and Fair and equitable sharing of benefits arising from genetic resources.	The commitment to conserving biological diversity must be considered in any WRMP24 options and the SEA should seek to promote the protection and enhancement of biodiversity.
European Commission (1992) The Habitats Directive 1992/43/EEC	
The Habitats Directive seeks to conserve natural habitats. Conservation of natural habitats requires member states to identify special areas of conservation and to maintain where necessary landscape features of importance to wildlife and flora. It is required that each Member State propose a list of sites indicating which natural habitat types and which species the sites host. The information would include a map of the site, its name, location and its extent. The Commission will then establish, in agreement with each Member State, a draft list of sites of Community importance drawn from the Member States' lists identifying those which host one or more priority natural habitat types or priority species.	The WRMP should take into account the habitats and species that have been identified under this Directive, and include provision for the preservation, protection and improvement of the quality of the environment as appropriate. The SEA assessment framework should incorporate sites protected for their nature conservation importance.
The European Convention on the Protection of Archaeological Heritage (Valletta Convention) (1992)	
The Valletta Convention is one of a series of Conventions for the protection of the cultural heritage produced by the Council of Europe over the last fifty years.	The SEA should take into account the need to conserve heritage.
Kyoto Protocol to the UN Framework Convention on Climate Change (1997)	
The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. It is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for industrialized countries for reducing greenhouse gas (GHG) emissions. These amounted to an average of five per cent against 1990 levels in the first commitment period (2008 to 2012). The Protocol is planned to be extended to 2020 (the Kyoto second commitment period), pending ratification of the Doha Agreement.	The WRMP should aim to reduce greenhouse gas emissions. The SEA assessment framework should include objectives/guide questions related to reducing greenhouse gas emissions.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) (1998)	
The Aarhus Convention grants the public rights regarding access to information, public participation and access to justice, in governmental decision-making processes on matters concerning the local, national and transboundary environment. It focuses on interactions between the public and public authorities. The Aarhus Convention has been ratified by the European Community, which has begun applying Aarhus-type principles in its legislation, notably the Water Framework Directive (Directive 2000/60/EC). The Convention is designed to improve the way ordinary people engage with government and decision-makers on environmental matters. It helps to ensure that environmental information is easy to get hold of and easy to understand.	The SEA should seek to provide easily understood information to the public on the environmental implications of the WRMP24 and its constituent options.
Drinking Water Directive (1998/83/EC)	
The objective of the Drinking Water Directive is to protect the health of the consumers in the European Union and to make sure the water is clean and of good quality. To make sure drinking water everywhere in the EU is healthy, clean and tasty, the Drinking Water Directive sets standards for the most common substances (so-called parameters) that can be found in drinking water. A total of 48 microbiological and chemical parameters must be monitored and tested regularly. The Directive was implemented in relation to public water supplies by the Water Supply (Water Quality) Regulations 2000, as amended.	The SEA should seek to ensure that objectives address water quality in the region, particularly drinking water quality
The Water Framework Directive (WFD) (2000/60/EC)	
This Directive establishes a framework for the protection of inland surface waters, transitional waters, coastal water and groundwater. It also encourages the sustainable use of water resources. Key objectives are general protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water.	The SEA should seek to promote the protection and enhancement of all water resources
The SEA Directive (Directive 2001/42/EC)	
The objective of the SEA Directive is “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view of contributing towards sustainable development”. Throughout the course of the development of the plan, policy or programme, the aim of SEA is to identify the potential impact of options proposed in the plan in terms of their environmental, economic and social	This directive is the driver for SEA. All topics identified in the SEA Directive should be considered within the scope of the assessment. Need to ensure that the subsequent Environmental Report meets

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
effects. If any adverse effects are identified, these options can then be avoided or proposals modified to manage or mitigate adverse effects.	the requirements of Annex I of the SEA Directive.
Commitments arising from the World Summit on Sustainable Development, Johannesburg (2002)	
The World Summit on Sustainable Development proposed broad-scale principles which should underlie sustainable development and growth. It included objectives such as: Greater resource efficiency; Work on waste and producer responsibility; New technology development; Push on energy efficiency; Integrated water management plans needed; and Minimise significant adverse effects on human health and the environment from chemicals by 2020.	These commitments are the highest level definitions of sustainable development. The WRMP24 should be influenced strongly by all of these themes and should seek to take its aims into account. The SEA should seek to promote the achievement of the sustainable development objectives outlined in this plan.
The Environmental Noise Directive (2002/49/EC)	
The END aims to define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to the exposure to environmental noise. It also aims to provide the basis for developing EU measures to reduce noise emitted by major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery.	The SEA assessment framework should include for the protection against excessive noise.
European Soils Charter (2003)	
Sets out common principles for protecting soils across the EU.	The SEA should seek to ensure that the quality of the regions land, including soils, is protected or enhanced.
European Commission Environmental Liability Directive (2004/35/EC)	
The Directive establishes a framework for environmental liability based on the "polluter pays" principle, with a view to preventing and remedying environmental damage.	The SEA should take account of direct or indirect damage to the aquatic environment or contamination of land that creates a significant risk to human health.
Thematic Strategy on Air Pollution (2005)	
This strategy supplements current legislation. It sets out objectives for air pollution and proposes measures for achieving them by 2020.	The SEA should take account of the need to reduce air

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
	pollution through the SEA objectives
Directive on Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC)	
The Directive establishes: Animal health requirements for the placing on the market, importation and transit of aquaculture animals and their products; Minimum measures to prevent diseases in aquaculture animals; and Minimum measures to be taken in response to suspected or established cases of certain diseases in aquatic animals.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Fresh Water Fish Directive (2006/44/EC)	
The Directive seeks to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. For those waters, it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters. The Directive is designed to protect and improve the quality of rivers and lakes to encourage healthy fish populations.	The SEA should take account of the need to promote the protection of river and lake water quality in order to maintain and develop suitable environments that will sustain freshwater fish populations.
Groundwater Directive (2006/118/EC)	
This Directive establishes specific measures as provided for in Article 17(1) and (2) of Directive 2000/60/EC (Water Framework Directive) in order to prevent and control groundwater pollution. This Directive is designed to prevent and combat groundwater pollution.	The SEA should take account of the need to maintain, protect and improve water quality across the WRMP area.
The European Landscape Convention (2006)	
European Landscape Convention (ELC) is the first international convention to focus specifically on landscape. Natural England implements the European Landscape Convention in England. The aims of the 2009/10 action plan are: Lead on improving the protection, planning and management of all England's landscapes; Raise the quality, influence and effectiveness of policy and practical instruments; Increase the engagement in and enjoyment of landscapes by the public; and Collaborate with partners across the UK and Europe.	The implementation of the WRMP24 may influence landscape or the enjoyment of landscapes in the Southern Water area and as such the SEA should seek to maintain or enhance the quality of the regions landscapes and the potential enjoyment of these landscapes.
Thematic Strategy for Soil Protection (2006)	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
The Thematic Strategy for Soil Protection consists of a Communication from the Commission to the other European Institutions, a proposal for a framework Directive (a European law), and an Impact Assessment.	The SEA assessment framework should include soils.
Directive on the Assessment and Management of Flood Risks (2007/60/EC)	
The Directive's aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive shall be carried out in coordination with the Water Framework Directive, notably by flood risk management plans and river basin management plans being coordinated, and through coordination of the public participation procedures in the preparation of these plans.	The WRMP should take account of the flood risk management plans. The SEA assessment framework should include flood risk.
Establishing measures for the recovery of the stock of European eel 2007 (1100/2007)	
This regulation provides a framework for the protection and sustainable use of the stock of European eel in Community waters, coastal lagoons, estuaries, rivers and communicating inland waters of member States that flow into specific seas.	The SEA should take account of the need to protect European eel.
Ambient Air Quality Directive (2008/50/EC)	
The 2008 ambient air quality directive (2008/50/EC) sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health such as particulate matter (PM10 and PM2.5) and nitrogen dioxide (NO2). As well as having direct effects, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) which can be transported great distances by weather systems.	The implementation of the WRMP24 may have some influence on air quality, either directly or indirectly through construction or operation activities. The SEA should seek to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum
Marine Strategy Framework Directive (2008/56/EEC)	
The Marine Strategy Framework Directive aims to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which mariner-elated economic and social activities depend. It is the first EU legislative instrument related to the protection of marine biodiversity, as it contains the explicit regulatory objective that "biodiversity is maintained by 2020", as the cornerstone for achieving GES.	The SEA should seek to maintain, protect and improve the marine environment across the region.
Defra (2011) Mainstreaming Sustainable Development	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
This document sets out the Government's vision for mainstreaming sustainable development in relation to the operation of its buildings and estates, including the goods and services that it buys and the policies it makes. It builds on the principles that underpinned the UK's 2005 sustainable development strategy, and highlights that long term economic growth relies on protecting and enhancing the environmental resources that underpin it, and paying due regard to social needs. It sets out measures to achieve the mainstreaming of sustainable development, which include ministerial leadership and oversight; leading by example; embedding sustainable development in government policy; and transparency and independent scrutiny.	The WRMP should seek to be aligned with the principles of sustainable development. The SEA assessment framework should include objectives relating to the principles of sustainable development, including communities, economy and environment.
Promotion of the use of energy and renewable sources Directive (2009/28/EC)	
This promotes the use of energy from renewable sources.	The SEA should seek to promote the use of renewable energy.
European Commission (2011) The EU Biodiversity Strategy to 2020	
The Directive seeks to: Halt the loss of biodiversity and ecosystem services in the EU; and help stop global biodiversity loss by 2020.	The implementation of the WRMP24 may influence biodiversity in the Southern Water District and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
United Nations Framework Convention on Climate Change (UNFCCC) (2011) The Cancun Agreements	
The Cancun Agreements were a set of significant decisions by the international community to address the long-term challenge of climate change collectively and comprehensively over time, and to take concrete action immediately to speed up the global response to it. The agreements, reached on December 11 in Cancun, Mexico, at the 2010 United Nations Climate Change Conference, represented key steps forward in capturing plans to reduce greenhouse gas emissions, and to help developing nations protect themselves from climate impacts and build their own sustainable futures. The Cancun Agreements' main objectives cover: • Mitigation • Transparency of actions • Technology	The WRMP should aim to reduce greenhouse gas emissions and support climate change mitigation and adaption. The SEA assessment framework should include greenhouse gas emissions and climate change.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
• Finance • Adaptation • Forests • Capacity building	
Blueprint to Safeguard Europe's Water Resources (2012)	
This strategy aims to ensure that enough good quality water is available to meet the needs of people, the economy and the environment. The strategy includes: Improving implementation of current EU water policy; Increasing the integration of water policy objectives into other relevant policy areas such as agriculture, fisheries, renewable energy, transport and the Cohesion and Structural Funds; and Filling the gaps of the current framework, particularly in relation to the tools needed to increase water efficiency.	The commitment to conserving biological diversity must be considered in any WRMP24 options and the SEA should seek to promote the protection and enhancement of biodiversity
Energy Act 2013	
This provides the legislative framework for delivering secure, affordable and low carbon energy.	The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
Directive on Bathing Water (76/160/EEC); and Directive 2006/7/EC repealing Directive 76/160/EEC (from 2014)	
The revised Bathing Water Directive (BWD) of 2006 updated and simplified the rules of the previous BWD. States are required to monitor and assess the bathing water for at least two parameters of (faecal) bacteria. In addition, they must inform the public about bathing water quality and beach management, through the so-called bathing water profiles. These profiles contain for instance information on the kind of pollution and sources that affect the quality of the bathing water and are a risk to bathers' health (such as waste water discharges).	The SEA should seek to maintain, protect and improve water quality across the region.
Paris Agreement (2015)	
Commitment to cut carbon emissions which came into force in November 2016.	The SEA should refer to the need to reduce carbon emissions.
The Water Resources Planning Guideline (2021)	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
The water resources planning guideline provides an update to the framework for water companies to follow in developing and presenting their water resources plans. It sets out good practice behind the composition of a plan, the approaches to developing a plan and the information that a plan should contain. The guideline states that where feasible water and sewerage companies should ensure that their long term planning for wastewater and water supply are aligned. Along with highlighting any linkages and, or interdependencies (or both). The guideline states that water/sewerage companies should consider alignment in their growth forecasts, climate change scenarios and timetable for delivering solutions.	The WRMP should align with the WRMP as suggested in the guideline. The SEA should seek to ensure that water supplies and resources are maintained or enhanced in line with the Water Resources Planning Guidelines.

National

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Salmon and Freshwater Fisheries Act 1975	
The Act lays down the present basic legal framework within which salmon and freshwater fisheries in England are regulated. Proposals have been made to extend the legislation to apply to more fish species e.g. coarse fish, eel and lamprey species. These proposals are currently under review. The Act covers legislation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement. Proposed extensions to the legislation (under review) include the provision of fish passes and screening of water abstraction and discharge points for coarse fish, eel and lamprey species.	The Act Provides statutory requirements for maintaining fish passage. The SEA will cover fish passage as an element of at least one sustainability objective. The SEA should seek to address any potential issues or effects on existing measures to address fish passage.
The Ancient Monuments and Archaeological Areas Act 1979	
This act addresses the protection of scheduled monuments including the control of works affecting scheduled monuments. It also addresses archaeological areas.	The WRMP24 and SEA should take account of the need to protect scheduled monuments and archaeological areas.
The Wildlife and Countryside Act 1981 (as amended)	
The Act is the principle mechanism for providing legislative protection of wildlife in Great Britain. Species listed in Schedule 5 of the Act are protected from	Some aspects of the WRMP24 may have effects on habitats and species in the southern area supply area and beyond. The SEA should

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
disturbance, injury, intentional destruction or sale. Other provisions outlaw certain methods of taking or killing listed species. This Act is brought up to date regularly to ensure the most endangered animals are on the schedule. The Act also improved protection for the most important wildlife habitats	seek to maintain or enhance the quality of habitats and biodiversity, and take regard of protected species and habitats.
Environmental Protection Act 1990	
This act addresses pollution control, waste (including duty of care), contaminated land, statutory nuisance and clean air	The WRMP24 and actions arising from it such as construction activities must comply with this act.
Planning (Listed Buildings and Conservation Areas) Act 1990	
This addresses listed buildings including prevention of deterioration and damage and preservation and enhancement of conservation areas.	The WRMP24 and SEA should take account of the need to protect listed buildings and conservation areas.
Water Industry Act 1991	
This makes provision for general duties of water undertakers including those associated with water resources management plans and sets out supply duties.	The WRMP24 must take into account this legislation.
Water Resources Act 1991	
The Water Resources Act applies to England and Wales and established the National Rivers Authority (now the Environment Agency) to regulate water pollution, water resources, flood defence, fisheries and navigation. The Act covers water abstraction and impounding and discharges to surface and ground waters and coastal waters.	The WRMP must ensure full compliance with the Act
Environment Act 1995	
The Environment Act set up the EA to manage resources and protect the environment in England and Wales	The SEA should seek to promote the protection and enhancement of all water resources without having negative effects on other aspects of the Environment.
Countryside and Rights of Way (CROW) Act 2000	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
The Act provides for increased public access to the countryside and strengthens protection for wildlife. The main provisions of the Act are as follows: Extends the public's ability to enjoy the countryside whilst also providing safeguards for landowners and occupiers; Creates new statutory right of access to open country and registered common Land Use Consultants; Modernises Right of Way system; Gives greater protection to SSSIs; Provides better management arrangements for AONBs; and Strengthens wildlife enforcement legislation.	The WRMP24 may have an effect on public access to the countryside. The SEA should include objectives that take into account public access, protection of SSSIs and the management of relevant landscape designations.
Water Act 2003 (as amended)	
The Water Act 2003 is in three Parts, relating to water resources, regulation of the water industry and other provisions. The four broad aims of the Act are: The sustainable use of water resources; Strengthening the voice of consumers; A measured increase in competition; and The promotion of water conservation.	The implementation of the WRMP24 may have an effect through its role in maintaining supplies of water. The SEA should seek to promote sustainable use of water resources.
Securing the Future - Delivering the UK Sustainable Development Strategy (2005)	
The strategy for sustainable development aims to enable all people to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations. The strategy places a focus on protecting natural resources and enhancing the environment.	The SEA must seek to ensure that objectives relating to sustainable development, sustainable resource use and protecting the natural environment, are considered when assessing the potential impacts of the WRMP24.
The Natural Environment and Rural Communities Act 2006 (NERC Act)	
This Act makes provision about bodies concerned with the natural environment and rural communities in connection with wildlife, sites of special scientific interest, National Parks and the Broads. The Natural Environment and Rural Communities Act is designed to help achieve a rich and diverse natural environment and thriving rural communities.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity. The impacts of the WRMP24 on any designated features, as highlighted in the Natural Environment and Rural Communities Act, should be addressed.
The Water Resources Management Plan Regulations 2007	
This provides the legislation for the preparation of water resources management plans.	The WRMP24 should take account of these requirements.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Climate Change Act 2008	
This act sets carbon targets for 2050. The net carbon account for 2050 at least 80% lower than 1990 baseline.	This target needs to be taken into account by the SEA.
Climate Change and the Historic Environment, English Heritage (2008)	
Sets out the current thinking on the implications of climate change for the historic environment. It is intended both for the heritage sector and also for those involved in the wider scientific and technical aspects of climate change; in the development of strategies and plans relating to the impact of climate change; or in projects relating to risk assessment, adaptation and mitigation.	The SEA should seek to assess the implications of the WRMP24 in combination with climate change and the potential impacts on heritage and the historic environment.
Planning Act 2008	
This Act introduced a new system for nationally significant infrastructure planning, alongside further reforms to the Town and Country Planning system.	The WRMP should consider any unforeseen NSIP proposals that come forward prior to adoption which may affect water resources in the region. The SEA should consider the cumulative effects of the WRMP and any unforeseen NSIP proposals that come forward which may affect water resources in the region.
Marine and Coastal Access Act (2009)	
This Act allows for the creation of Marine Conservation Zones (MCZs). MCZs protect a range of nationally important marine wildlife, habitats, geology and geomorphology, and can be designated anywhere in English and Welsh territorial and UK offshore waters.	The WRMP24 may have an effect on the marine environment. The SEA should assess the effects on designated features of relevant MCZs and Recommended MCZs.
Safeguarding our Soils - A strategy for England, Defra (2009)	
The Soil Strategy for England - Safeguarding our Soils - outlines the Government's approach to safeguarding our soils for the long term. It provides a clear vision to guide future policy development across a range of areas and sets out the practical steps that we need to take to prevent further degradation of our soils, enhance, restore and ensure their resilience, and improve our understanding of the threats to soil and best practice in	The SEA should seek to ensure that the quality of the regions soils and their management is protected or enhanced.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
responding to them. The Governments vision is that: By 2030, all England's soils will be managed sustainably and degradation threats tackled successfully. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.	
The Eels (England & Wales) Regulations 2009 (as amended)	
Implement European Council Regulations 1100/2007 establishing measures for the recovery of the stock of European eel. The Regulations will help implement delivery Eel Management Plans. They address eel records and re-stocking, close season and reduction of fishing effort, passage of eels and entrainment. The key objective is to ensure that at least 40% of the potential production of silver eels returns to the sea to spawn. This will be achieved by reducing exploitation of all life-stages of the eel and restoration of their habitats.	The SEA should seek to should seek to maintain or enhance the quality of habitats and biodiversity, and take regard of protected species identified. This should include migratory fish species and their migratory passage.
Delivering a healthy natural environment. Ecosystem approach action plan, Defra (2010)	
Addresses the Government's approach to valuing economic and social benefits of a healthy natural environment while continuing to recognise nature's intrinsic value. It describes the vision of the Government for this to be the first generation to leave the natural environment of England in a better state than it inherited, requiring placing the value of nature at the heart of decision-making - in Government, local communities and businesses. Approaches to mainstream the value of nature across society include: Facilitating greater local action to protect and improve nature; Creating a green economy, in which economic growth and the health of our natural resources sustain each other, and markets, business and Government better reflect the value of nature; Strengthening the connections between people and nature to the benefit of both; and Showing leadership in the European Union and internationally, to protect and enhance natural assets globally.	Ecosystem services may include: Provisioning Services: Biodiversity Regulating Services: Water Regulation Cultural services: Recreation and ecotourism Cultural services: Cultural heritage values Cultural services: Aesthetic. The SEA should ensure the WRMP24 meets provisioning services in the least damaging way through WRMP24 options.
Flood and Water Management Act 2010	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
The Flood and Water Management Act 2010 aims to provide better, more comprehensive management of flood risk for people, homes and businesses. It aims improve efficiency in the water industry, improve the affordability of water bills for certain groups and individuals, and help ensure continuity of water supplies to the consumer.	The WRMP24 also aims to ensure continuity of water supplies across the region are maintained.
Making Space for Nature - A review of England's Wildlife Sites and Ecological Network (2010)	
This independent review of England's wildlife sites and the connections between them sets objectives and recommendations to help achieve a healthy natural environment that will allow our plants and animals to thrive.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Biodiversity 2020: A strategy for England's wildlife and ecosystem services, Defra (2011)	
The objective for the next decade is: 'to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.' Four action areas are: A more integrated large-scale approach to conservation on land and at sea; Putting people at the heart of biodiversity policy; Reducing environmental pressures; and Improving our knowledge.	The SEA must consider impacts on biodiversity. The implementation of the WRMP24 may influence biodiversity in the area and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity, and have due regard to priority species.
The Natural Choice: Securing the Value of Nature, Defra (2011)	
Addresses the Government's approach to valuing economic and social benefits of a healthy natural environment while continuing to recognise nature's intrinsic value. It describes the vision of the Government for this to be the first generation to leave the natural environment of England in a better state than it inherited, requiring placing the value of nature at the heart of decision-making - in Government, local communities and businesses. Approaches to mainstream the value of nature across society include: Facilitating greater local action to protect and improve nature; Creating a green economy, in which economic growth and the health of our natural resources sustain each other, and markets, business and Government better reflect the value of nature; Strengthening the	Ecosystem services may include: Provisioning Services: Biodiversity Regulating Services: Water Regulation Cultural services: Recreation and ecotourism Cultural services: Cultural heritage values Cultural services: Aesthetic. The SEA should ensure the WRMP24 meets provisioning services in the least damaging way through WRMP24 options.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
connections between people and nature to the benefit of both; and Showing leadership in the European Union and internationally, to protect and enhance natural assets globally.	
Water for Life White Paper, Defra (2011)	
The Water White Paper described the Government's intentions to take forward a catchment-based approach to water quality and diffuse pollution and work towards Common Agricultural Policy reforms that will promote the farming industry's role as custodian of the natural environment. The Water White Paper and subsequent Defra strategic policy supports catchment-based approaches to prevent and manage future risks to drinking water quality from agricultural activities, working in partnership with farming communities. These policy objectives are reflected in regulatory guidance (WRPG) from Government and the regulators. The catchment-based approach has now been implemented across England, with catchment partnerships now in place across the river basin to take forward the approach over the coming years.	The WRMP24 should take into account the contents of this paper.
UK Marine Policy Statement (2011)	
The Marine Policy Statement (MPS) sets out the framework for preparing Marine Plans and taking decisions affecting the marine environment, supporting the delivery of the following high-level marine objectives: • Achieving a sustainable marine economy; • Ensuring a strong, healthy and just society; • Living within environmental limits; • Promoting good governance; • Using sound science responsibly. Does not contain any targets.	The WRMP should take into account its effects on coastal areas. The SEA assessment should take into account the effects of the actions on the coast/marine environment where relevant.
National Policy Statement for Wastewater (2012)	
A framework document for planning decisions on nationally significant wastewater infrastructure.	The WRMP24 should take into account the contents of this paper.
UK Post-2010 Biodiversity Framework, Joint Nature Conservation Committee (JNCC) and Defra (2012)	
The UK Biodiversity Action Plan (UK BAP) was published in 1994 and was the UK government's	The commitment to conserving biological diversity must be considered in any WRMP24

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
response to the Convention on Biological Diversity. The UK BAP described the biological resources of the UK and provided detailed plans for conservation of these resources. Action plans for the most threatened species and habitats were set out to aid recovery, and national reports, produced every three- to five-years, showed how the UK BAP was contributing to the UK's progress towards the significant reduction of biodiversity loss. The 'UK Post-2010 Biodiversity Framework', published in July 2012, succeeds the UK BAP and 'Conserving Biodiversity - the UK Approach', and is the result of a change in strategic thinking following the publication of the Convention on Biological Diversity's (CBD) 'Strategic Plan for Biodiversity 2011-2020.	options and the SEA should seek to promote the protection and enhancement of biodiversity.
UK National Ecosystem Assessment Follow-on (2014)	
Ecosystems services from natural capital contribute to the economic performance of the nation. Information and tools to enable decision makers to understand the wider value of ecosystems and their associated services.	For the purposes of the readership integrating an ecosystems services approach into the SEA is not being undertaken. However, it is realised that through the 'objective-led' approach, many of the services relevant to the WRMP24 can be considered through the objectives and key questions for example: Provisioning Services: Freshwater Provisioning Services: Biodiversity Regulating Services: Water Regulation Cultural services: Recreation and ecotourism Cultural services: Cultural heritage values Cultural services: Aesthetic The SEA should ensure the WRMP24 effects the related provisioning services in the least damaging way through informing the WRMP24 formulation and selection of WRMP24 options. In the event of further guidance being issued on incorporating ESA into SEA, the anticipated approach is sufficiently flexible that it should be able to accommodate this (subject to timing).
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015	
These regulations amend the 2009 regulations and provide additional protection to habitats and species identified on Annexes 1 and 2 of the EC Habitats Directive (92/43/EEC), SSSIs and, in some cases, classified waterbodies from environmental damage where an operator has intended to cause damage or been negligent to the potential for damage. Applies to the most serious categories of environmental damage,	The SEA should seek to ensure that the guidance provided by the regulations is considered as WRMP24 options.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
including: Contamination of land that results in a significant risk of adverse effects on human health; Adverse effects on surface water or groundwater consistent with a deterioration in the water's status; Adverse effects on the integrity of a Site of Special Scientific Interest (SSSI) or on the conservation status of species and habitats protected by EU legislation outside SSSIs.	
The Great Britain Invasive Non-Native Species Strategy, Defra (2015)	
The Strategy is intended to provide a strategic framework, updated from the 2008 framework, within which the actions of government departments, their related bodies and key stakeholders can be better co-ordinated. Its overall aim is to minimise the risks posed, and reduce the negative impacts caused, by invasive non-native species in Great Britain.	The implementation of the WRMP24 may influence biodiversity in the southern water area and the south east and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Conservation 21 - Natural England's Conservation Strategy for the 21st Century, Natural England (2016)	
Conservation 21 sets out how Natural England will work to protect England's nature and landscapes for people to enjoy and for the services they provide, in support of Defra's ambitions for the environment.	The WRMP24 should take into account the contents of this strategy.
Managing Water Abstraction, Environment Agency (2013)	
Managing Water Abstraction sets out how the EA manage water resources in England and Wales. It is the overarching document that links together the abstraction licensing strategies. The availability of water resources for abstraction is assessed through a Catchment Abstraction Management Strategy (CAMS) approach.	The SEA should include a guide question relating to the sustainable use of water resources.
Historic England (2015) The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning 3	
This document sets out guidance, against the background of the NPPF, on managing change within the settings of heritage assets, including archaeological remains and historic buildings, sites, areas, and	The WRMP24 and SEA should take account of the need to protect and enhance the setting of heritage assets

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
landscapes. It gives general advice on understanding setting, and how it may contribute to the significance of heritage assets and allow that significance to be appreciated, as well as advice on how views contribute to setting.	
National Infrastructure Delivery Plan 2016-2021, Infrastructure and Projects Authority (HM Government) (2016)	
The Plan focuses on economic infrastructure: the networks and systems in energy, transport, digital communication, flood and coastal protection, water and waste management. These are all critical to support economic growth through the expansion of private sector businesses across all regions and industries, to enable competitiveness and to improve the quality of life of everyone in the UK. Objectives for the water and waste sector include to reduce average bills of about 5% in real terms, and plans for further expenditure from 2020 with the start of Asset Management Period 7.	The WRMP24 could result in the production of additional waste. The SEA should seek to reduce the production of waste and ensure it is treated in line with the widely adopted 'waste hierarchy' and not sent to landfill. The WRMP24 can contribute to the providing resilient water services.
Standing Advice on Protected Species, Natural England (2016)	
This standing advice comprises a number of guides on the following protected species: Bats Great crested newts Badgers Hazel dormice Water voles Otters Wild birds Reptiles Protected plants White-clawed crayfish Invertebrates Freshwater fish Natterjack toads Ancient woodland and veteran trees	The SEA should seek to protect protected species and include this in the SEA objectives.
Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment, Historic England (2016)	
Guidance for addressing the historic environment in Strategic Environmental Assessment or Sustainability Appraisal. It identifies the recommended list of plans, programmes and policies for review, approach to baseline review, potential sustainability issues.	The SEA should consider the potential effects of the WRMP24 on the historic environment, particularly designated assets and their settings, and to important wetland areas with potential for paleo-environmental deposits. Historic characterisation can supplement information about designations. Sustainability issues, objectives and indicators identified in this document should be taken into account in the SEA.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Water Resources Planning Framework (2015-2065), Water UK (2016)	
The primary aim of the project is to develop a high level strategy and framework for the long term planning of water resources for Public Water Supply in England and Wales	The SEA should seek to promote the protection and enhancement of all water resources.
The Conservation of Habitats and Species Regulations (2017) (as amended)	
The Conservation of Habitats and Species Regulations 2017 are the principal means by which the Habitats Directive is transposed in England and Wales as such its main objective is to promote the maintenance of biodiversity.	The impacts of the WRMP24 on species diversity must be considered as part of the SEA.
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)	
These Regulations make provision for the purpose of implementing in river basin districts within England and Wales The Water Framework Directive (2000/60/EC) of the European Parliament. The Regulations require a new strategic planning process to be established for the purposes of managing, protecting and improving the quality of water resources.	The SEA should seek to promote the protection and enhancement of all water resources. The SEA should seek to maintain, protect and improve water quality across the region and ensure efficient use of resources.
UK Climate Change Risk Assessment, Defra (2017)	
This report outlines the UK and Devolved Governments' views on the key climate change risks and opportunities that the UK faces. The report endorses the six priority risk areas identified in the independent evidence report by the Adaptation Sub-Committee: from flooding and coastal change; to health and well-being from high temperatures; due to water shortages; to natural capital; to food production and trade from pests and diseases and invasive non-native species. Specifically, the report sets out a series of challenges for the water industry. It states that: "Climate change is projected to reduce the amount of water in the environment that can be sustainably withdrawn whilst increasing the demand for irrigation during the driest months. At the same time the growing population will create additional demands on already stretched resources in some parts of the country."	The WRMP24 and SEA needs to take account of the key climate change adaptation risks and opportunities identified in relation to the water environment.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
A Green Future: Our 25 Year Plan to Improve the Environment, UK Government (2018)	
The 25 Year Environment Plan sets out the Government's environmental plan of action over the next quarter century, in the context of Brexit. The Plan aims to tackle the growing problems of waste and soil degradation, improving social justice through tackling pollution and promoting the mental and physical health benefits of the natural world. It also sets out how the Government will address the effects of climate change. These aims are supported by a range of policies which are focused on the following six key areas: Using and managing land sustainably; Recovering nature and enhancing the beauty of landscapes; Connecting people with the environment to improve health and wellbeing; Increasing resource efficiency, and reducing pollution and waste; Securing clean, productive and biologically diverse seas and oceans; and Protecting and improving the global environment.	The SEA should seek to promote the achievement of the environmental objectives outlined in this plan.
Creating a better place: Our ambition to 2020, Environment Agency (2018)	
This sets out the EA's priorities for the environment to 2020, fully supporting the government's 25 year Environment Plan. The EA pledges to work to deliver all ten of the goals laid out in the Environment Plan.	The SEA should seek to ensure that relevant goals are also reflected in the SEA objectives particularly regarding the protection and improvement of water, land and biodiversity.
Defra and The Environment Agency (2018) Resources and waste strategy for England	
This white paper outlines a package of reforms so that by 2030 there will be a flexible, smart and responsive electricity system, powered by a range of low carbon sources of electricity. This includes engaging with consumers on energy use. Decarbonisation is important in meeting the 2050 targets.	The implementation of the WRMP24 may have an influence upon Southern Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
Environment Agency and Natural Resources Wales (2018) Water Resources Planning Guideline: Interim update	
Technical guidelines published jointly by the Welsh Government, NRW, Defra, Environment Agency and	The WRMP should consider the guideline, where relevant.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Ofwat for the 2019 Water Resource Management Plans for England and Wales. The water resources planning guideline provides a framework for water companies to follow in developing and presenting their water resources plans. It sets out good practice behind the composition of a plan, the approaches to developing a plan and the information that a plan should contain. Companies should follow this guideline to ensure that their plans cover the requirements specified by the Water Industry Act 1991.	The SEA should seek to ensure that water supplies and resources are maintained or enhanced in line with the Water Resources Planning Guidelines.
HM Government (2018) The Water Supply (Water Quality) Regulations 2018	
These regulations address the quality of water supplied by water undertakers, who supply areas mainly or wholly in England. The new Regulations implement Directive 98/83/EC on the quality of water intended for human consumption. Under these Regulations, water undertakers are required to identify the areas that are to be water supply zones on an annual basis. A water supply zone cannot exceed 100,000 in terms of population before the beginning of each year of the supply. The standards of wholesomeness are set out, in respect of water for human consumption, be that through drinking, washing, food preparation or cooking and food production. In order to qualify as wholesome, the water cannot contain any: • micro-organism, other than those listed in the full text of Schedule 1 to the Regulations, or parasite; or • substances, other than those listed in the full text of Schedule 1 to the Regulations.	The WRMP should consider the Regulations. The SEA should take into account potential effects of the measures on drinking water quality.
The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting, Defra (2018)	
The National Adaptation Programme (NAP) sets the actions that government and others will take to adapt to the challenges of climate change in the UK. It sets out key actions for the next 5 years. Flooding and pressure on water services are considered to be cross cutting risks. The report also details how the third cycle of adaptation reporting will be managed, forming part of the five-yearly cycle of requirements laid down in the Climate Change Act 2008.	The SEA should consider the potential to include adaptive measures for climate change.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019)	
These regulations consolidate all the various amendments made to the Conservation (Natural Habitats) Regulations 1994 in respect of England and Wales. The 1994 Regulations transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites. Under the Regulations, competent authorities i.e. any Minister, government department, public body, or person holding public office, have a general duty, in the exercise of any of their functions, to have regard to the EC Habitats Directive. New provisions implement aspects of the Marine & Coastal Access Act 2009. These provisions provide for: • the transfer of certain licensing functions from Natural England to the Marine Management Organisation (MMO); • Marine Enforcement Officers to use powers under the Marine Act to enforce certain offences under the Habitats Regulations. The 2019 (EU Exit) amendment to the Regulations ensures that the habitat and species protection and standards derived from EU law will continue to apply after Brexit.	The WRMP must ensure full compliance with the Regulations. The SEA should take into account the effects of the actions on biodiversity.
The Invasive Alien Species (Enforcement and Permitting) Order 2019	
This Order allows for the enforcement of the EU Invasive Alien Species Regulation 1143/2014 on the prevention and management of invasive alien plant and animal species in England and Wales, including the relevant licenses, permits and rules for keeping invasive alien species.	The SEA should seek to address any potential issues or effects on existing measures to address invasive alien species.
Meeting our future water needs: a national framework for water resources, Environment Agency (2020)	
The national framework explores England's long-term water needs for:	The WRMP should seek to support the achievement of the aims of the framework.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
• public water supplies • agriculture • the power and industry sectors • environmental protection It sets out the principles, expectations and challenges for 5 regional groups (made up of the 17 English water companies and other water users). These have been developed and agreed by the regional groups, other major water abstractors, government, regulators and stakeholders. The national framework considers the needs of the whole region and of other water users. It looks at how these needs fit with the national water picture and how we can provide the resilience and environmental protection needed.	The SEA should include an objective/guide question relating to water resources.
National Flood and Coastal Erosion Risk Management Strategy for England, Environment Agency (2020)	
This strategy describes what needs to be done by all risk management authorities (RMAs) involved in flood and coastal erosion risk management for the benefit of people and places. They must exercise their flood and coastal erosion risk management (FCERM) activities, including plans and strategies, consistently with the strategy. Through its 'strategic overview' role the Environment Agency exercises its strategic leadership for all sources of flooding and coastal change. This strategy seeks to better manage the risks and consequences of flooding from all sources.	The WRMP24 and SEA should ensure relevant flood and coastal erosion risk considerations are integral to management decisions across the range of temporal and spatial scales.
State of Natural Capital Annual Report 2020, Natural Capital Committee (2020)	
The Natural Capital Committee is an independent advisory body to government. The report sets out the work carried out by the committee since March 2019; supporting a better understanding of England's natural assets and the benefits obtained from nature. The report has helped to ensure that natural capital is integrated into government policy.	The SEA should take into consideration report findings and recommendations.
National Planning Policy Framework (NPPF) (2021)	
Presumption in favour of sustainable development. Core planning principles include taking account of the development needs of an area; contribute to conserving	The WRMP24 and SEA should take account of the key components of sustainable development and consider the three

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
and enhancing the environment; re-use of previously developed land; conserve heritage assets; deliver sufficient community facilities to meet local needs. Delivering sustainable development includes: Building a strong competitive economy; Supporting a prosperous rural economy; Promoting sustainable transport; Requiring good design; Promoting healthy communities; Protecting green belt land; Meeting the challenge of climate change, flooding and coastal change; Conserving and enhancing the natural environment; Conserving and enhancing the historic environment; and Facilitating the sustainable use of minerals.	dimensions to sustainable development: economic, social and environmental.
Marine Plans - South East Inshore, South Inshore, South Offshore	
The South West Marine Plan introduces a strategic approach to planning within the inshore and offshore waters between the River Severn border with Wales and the River Dart in Devon. It provides a clear, evidence-based approach to inform decision making by marine users and regulators on where activities might take place within the marine plan areas. The plan contains a series of 13 objectives, grouped under three broad headings, the application of which are supported by the policies of the plan: **Achieving a sustainable marine economy** 1. Infrastructure is in place to support and promote safe, profitable and efficient marine businesses. 2. The marine environment and its resources are used to maximise sustainable activity, prosperity and opportunities for all, now and in the future. 3. Marine businesses are taking long-term strategic decisions and managing risks effectively. They are competitive and operating efficiently. 4. Marine businesses are acting in a way which respects environmental limits and is socially responsible. This is rewarded in the market place. **Ensuring a strong, healthy and just society** 5. People appreciate the diversity of the marine environment, its seascapes, its natural and cultural heritage and its resources and can act responsibly. 6. The use of the marine environment is benefiting society as a whole, contributing to resilient and cohesive communities that can adapt to coastal erosion and flood	The SEA assessment framework should, where relevant, contain objectives and guide questions that reflect the objectives of the plan. For example, the SEA assessment should include objectives relating to socio-economic wellbeing, human health, climate change, biodiversity, cultural heritage, landscape/seascape and water quality and quantity.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
risk, as well as contributing to physical and mental wellbeing. 7. The coast, seas, oceans and their resources are safe to use. 8. The marine environment plays an important role in mitigating climate change. 9. There is equitable access for those who want to use and enjoy the coast, seas and their wide range of resources and assets and recognition that for some island and peripheral communities the sea plays a significant role in their community. 10. Use of the marine environment will recognise, and integrate with, defence priorities, including the strengthening of international peace and stability and the defence of the United Kingdom and its interests. **Living within environmental limits** 11. Biodiversity is protected, conserved and, where appropriate, recovered, and loss has been halted. 12. Healthy marine and coastal habitats occur across their natural range and are able to support strong, biodiverse biological communities and the functioning of healthy, resilient and adaptable marine ecosystems. 13. Our oceans support viable populations of representative, rare, vulnerable, and valued species.	
The Environment Act 2021	
The Environment Act sets out how the UK will maintain environmental standards and build on the 25 Year Environment Plan.	The WRMP24 should seek to protect and enhance the natural environment, taking into consideration he principals and guidance set out through the Environment Bill
Water Resources Planning Guideline and Technical Supplementary Guidance, Environment Agency, OfWAT and Natural Resources Wales (2022)	
Technical guidelines published jointly by the Welsh Government, NRW, Defra, Environment Agency and Ofwat for the 2019 Water Resource Management Plans for England and Wales. The water resources planning guideline provides a framework for water companies to follow in developing and presenting their water resources plans. It sets out good practice behind the composition of a plan, the approaches to developing a plan and the information	The WRMP should consider the guideline, where relevant. The SEA should seek to ensure that water supplies and resources are maintained or enhanced in line with the Water Resources Planning Guidelines.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
that a plan should contain. Companies should follow this guideline to ensure that their plans cover the requirements specified by the Water Industry Act 1991.	

Regional/Local

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Chichester Harbour AONB Management Plan 2019-2024 (Chichester Harbour Conservancy)	
The areas covered by the plan include the overall management of the AONB, sustainable development, landform and landscape character, biodiversity, farmed landscape, woodland and trees, historic and cultural heritage, heritage coast, geology and natural resources, vibrant communities and access, enjoyment and understanding.	The WRMP24 operation may have the potential to affect several of the objectives of the Chichester Harbour AONB. The SEA will include objectives that take into account the AONB objectives where relevant
Chiltern Hills AONB Management Plan 2014-2019	
Objectives are under the headings of conserving and enhancing natural beauty, landscape, farming, forestry and other land management, biodiversity, water environment, historic environment and development.	The WRMP24 operation may have the potential to affect the broad aims and policies identified in the vision of the Chilterns AONB management plan. The SEA should include objectives that take into account the broad aims and policies important to the vision of the Chilterns AONB management plan where relevant (e.g. conserving river and wetland habitats.)
Cotswolds AONB Management Plan 2013-2018	
Objectives include those associated with conserving and enhancing the AONB.	The WRMP24 operation may have the potential to affect several of the objectives for managing the Cotswolds AONB. The SEA should include objectives that take into account the objectives of the Cotswolds AONB management where relevant
Cranborne Chase AONB Management Plan 2019-2024	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
The plan determines strategies for conserving, protecting and educating about the AONB's history, environment and culture. Key focuses include the sustainable management of natural resources within the AONB, allowing free movement of wildlife.	The WRMP24 operation may have the potential to affect several of the objectives of the Cranborne Chase and West Wiltshire Downs AONB. The SEA will include objectives that take into account the AONB objectives where relevant.
Dorset AONB - A Framework for the Future AONB Management Plan 2019 - 2024	
Provides local & spatial plans, catchment plans, marine planes, development management, rural investment strategies and community planning to guide and inform users and stakeholder on activities affecting the AONB. The plan emphasises the key concepts of Sustainable Development, Ecosystem Approach and Landscape Approach.	The WRMP24 operation may have the potential to affect several of the objectives of the Dorset AONB. The SEA will include objectives that take into account the AONB objectives where relevant.
Drought Plans from adjacent water companies	
These include: • Affinity Water • Portsmouth Water • South East Water • Sutton East Surrey Water • Bournemouth Water • Wessex Water • Thames Water	The WRMP24 and SEA to take these into account these plans in the cumulative effects assessment.
Environment Agency Catchment Abstraction Management Strategies (CAMS)	
CAMS was the approach used by the Environment Agency to assess the amount of water available for further abstraction licensing taking account of the needs of the environment. The relevant Catchment Abstraction Management Strategies (CAMS) were last produced in 2013-14 and have now been incorporated into the WFD process since the 2nd cycle River Basin Management Plans in 2015. The aims of abstraction strategies are to: • make information on water resource availability and the catchment licensing strategy more readily available	The WRMP24 could affect issues identified within in the individual CAMS within the area. The SEA will include objectives that ensure that the effect of the WRMP24 on the sustainable water abstraction assessed.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
• provide a consistent and structured approach to local water resource management • recognise both the abstractor's reasonable need for water and environmental needs • provide mechanisms to assess water resources availability • provide results which ensure the relevant Water Framework Directive objectives are met • provide tools to aid licensing decisions - particularly management of time limited licences.	
Green infrastructure plans	
The NPPF defines green infrastructure as 'a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities' (including rivers and ponds). Local planning authorities are required to plan positively for strategic networks of green infrastructure, and take account of the benefits of green infrastructure in reducing the risks posed by climate change. The majority of LAs have therefore developed Green Infrastructure Strategies or Studies addressing these issues. Green infrastructure will often play a large part in local recreational resources.	The SEA should take account of the need to protect and enhance the green infrastructure network.
Isle of Wight AONB Management Plan 2014 - 2019 (Wight AONB Partnership)	
The areas covered by the plan include the overall management of the AONB, sustainable development, landform and landscape character, biodiversity, farmed landscape, woodland and trees, historic and cultural heritage, heritage coast, geology and natural resources, vibrant communities and access, enjoyment and understanding.	The WRMP24 operation may have the potential to affect several of the objectives of the Isle of Wight AONB. The SEA will include objectives that take into account the AONB objectives where relevant.
Kent Downs AONB Management Plan 2014-2019	
The areas covered by the plan include the overall management of the AONB, sustainable development, landform and landscape character, biodiversity, farmed landscape, woodland and trees, historic and cultural heritage, heritage coast, geology and natural resources, vibrant communities and access, enjoyment and understanding.	The WRMP24 operation may have the potential to affect several of the objectives of the Kent Downs AONB. The SEA will include objectives that take into account the AONB objectives where relevant.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Partnership Plan for the New Forest National Park 2021-2026	
Supplementing the National Park Management Plan, the Partnership Plan has five objectives: 1. Nature Recovery - habitats are restored, expanded and maintained to enable wildlife to thrive, both within and around the National Park 2. Net Zero with Nature (NZWN) - significant cuts in land-based carbon emissions are secured through restoring natural habitats and carbon capture 3. Thriving Forest - a living, working Forest is sustained through support for cultural heritage, commoning, local produce, sustainable tourism, access to affordable homes and helping to attract high-value businesses and employees 4. An inclusive National Park- people within reach of the New Forest, of all backgrounds, abilities and socio-economic groups, value the National Park as an important part of their lives and seek to care for it 5. Team New Forest - communities, businesses and organisations work together as a team to deliver the vision of the Partnership Plan, sharing knowledge, ideas and resources to deliver the best for the Forest	The WRMP24 may have the potential to affect the achievement of objectives. SEA will include objectives that take into account relevant aspects of the Partnership Plan's objectives.
Public Rights of Way Improvement Plans (ROWIP)	
These plans are prepared by local authorities to describe how improvements to the public rights of way network will be undertaken to provide a better experience for a range of users. ROWIPs are reviewed every ten years	The WRMP24 may affect public rights of way (PRoW) for example due to construction. The SEA should include an objective that protects PRoW.
RSPB Pagham Harbour Local Nature Reserve Management Plan 2013-2018	
This is a five-year strategy for the management of the RSPB's Pagham Harbour Local Nature Reserve. The purpose of the plan is maintain, improve and extend the important habitats within the area. The habitats support some of the most important wetland bird populations and wildlife in southern England. A key objective is to maintain its SPA and Ramsar status for Brent Geese, Black-tailed Godwits, Pintails and Little Terns.	The WRMP24 may have the potential to affect several of the ambitions for the Pagham Harbour Local Nature Reserve Management Plan. The SEA will include objectives that take into account the plan objectives where relevant.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Surrey Hills AONB Management Plan 2020-2025	
The areas covered by the plan include the overall management of the AONB, sustainable development, landform and landscape character, biodiversity, farmed landscape, woodland and trees, historic and cultural heritage, heritage coast, geology and natural resources, vibrant communities and access, enjoyment and understanding.	The WRMP24 operation may have the potential to affect several of the objectives of the Surrey Hills AONB. The SEA will include objectives that take into account the AONB objectives where relevant.
Surrey Wildlife Trust 5-year Plan 2018-2023	
This is the five year strategy for the management of the wildlife sites managed by Surrey Wildlife Trust. The purpose of the plan is to deliver: protection and accessibility of wildlife, its habitats and places of natural beauty; teaching the community about nature, biodiversity, wildlife conservation and sustainable development; and support research into natural heritage to promote evidence based activity.	The WRMP24 may have the potential to affect several of the ambitions for the Surrey Wildlife Trust Management Plan. The SEA will include objectives that take into account the plan objectives where relevant.
The High Weald AONB Management Plan 2019-2024	
The areas covered by the plan include the overall management of the AONB, sustainable development, landform and landscape character, biodiversity, farmed landscape, woodland and trees, historic and cultural heritage, heritage coast, geology and natural resources, vibrant communities and access, enjoyment and understanding.	The WRMP24 operation may have the potential to affect several of the objectives of the High Weald AONB. The SEA will include objectives that take into account the AONB objectives where relevant.
The North Wessex Downs AONB Management Plan 2014-19	
The areas covered by the plan include the overall management of the AONB, sustainable development, landform and landscape character, biodiversity, farmed landscape, woodland and trees, historic and cultural heritage, heritage coast, geology and natural resources, vibrant communities and access, enjoyment and understanding	The WRMP24 operation may have the potential to affect several of the objectives of the North Wessex Downs AONB. The SEA will include objectives that take into account the AONB objectives where relevant.
Water Resources in the South East (WRSE) Group (forthcoming) regional water resources strategy	

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
The WRSE's group aim is to develop a regional water resources strategy to contain a range of options to determine the best long term solutions for customers and the environment of the south east of England. Once prepared and publicly available this will form the 'building blocks' of water companies' next set of WRMP24 s.	The WRMP24 and SEA should take account of this strategy subject to when it becomes available.
West Sussex County Council (2005), A Strategy for the West Sussex Landscape	
This strategy aims to enhance and protect the character and diversity of the West Sussex landscape.	The WRMP24 should take account of this plan.
Environment Agency (2007), Water for the Future - Managing Water in the South East of England	
A short paper explaining why water resources are going to become an increasingly important issue in the south east of England due to Government proposed development, climate change, available resources and usage patterns. Promotes consumer management of water resources by changing behaviour, and suggests this may preclude the need for some development schemes which have environmental impacts. Mentions a number of ways by which water companies can reduce water demand, including: • leakage reduction • installation of water meters • new tariffs to encourage efficient water use • retrofitting water saving devices to existing homes and businesses, designing new homes to be water efficient • sharing of resources by water companies	The WRMP24 should be aligned to these objectives where possible. For example, sharing of resource by water companies.
Environment Agency (2009), Water Resources Strategy. Regional Action Plan for Southern Region	
The vision of the plan is for more people in the South East to enjoy new and improved water related recreation contributing to a better quality of life, health and environment. The strategic priorities are designed to: • Encourage action by a range of interested parties and individuals; • deliver well managed, new and better opportunities for more people to enjoy • water environments; • Tackle some of the issues that arise from changes in the demand for recreation, • the supply of water bodies and gaps in provision;	The WRMP24 may have the potential to affect the water environment in the South East, such as reducing river levels with potential impacts on recreation activities. The SEA should include objectives that take into account the maintenance of the water environment to ensure access, recreation and enjoyment.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
• Ensure everyone can enjoy water environments.	
South East Biodiversity Strategy (2009), South East England Biodiversity Forum Environment Agency (2010), Water Resources Strategy - A Regional Action Plan for Thames Region	
The strategy aims to be a clear, coherent and inspiring vision and framework that guides and supports all those who can impact biodiversity in the south east region. The South East Biodiversity Strategy aims to: • Be a clear, coherent and inspiring vision for the south east • Provide a framework for the delivery of biodiversity targets that guide and support all those who have an impact on biodiversity in the region • Embed a landscape scale approach to restoring whole ecosystems in the working practices and policies of all partners • Create the space needed for wildlife to respond to climate change • Enable all organisations in the south east to support and improve biodiversity across the region • Be a core element within the strategies and delivery plans of organisations across the south east region.	The implementation of the WRMP24 may influence biodiversity in the south east and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Defra (2010), Eel Management plans for the United Kingdom South East River Basin District and Implementation of UK Eel Management Plans (2017-2020)	
The Eel Management Plan for the South East River Basin District (RBD) aims to describe the current status of eel populations, assess compliance with the target set out in Council Regulation No 1100/2007 and detail management measures to increase silver eel escapement.	The WRMP24 operation may have the potential to impact on fish and eel migration. The SEA will cover fish and eel passage as an element of at least one sustainability objective.
Environment Agency (2011), Water Resources Strategy - A Regional Action Plan for Thames Region	
The vision of the plan is for more people in London and the South East to enjoy new and improved water related recreation contributing to a better quality of life, health and environment. The strategic priorities are designed to: • Encourage action by a range of interested parties and individuals; • deliver well managed, new and better opportunities for more people to enjoy water environments;	The WRMP24 may have the potential to affect the water environment in London and the South East, such as reducing river levels with potential impacts on recreation activities. The SEA should include objectives that take into account the maintenance of the water environment to ensure access, recreation and enjoyment.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
• Tackle some of the issues that arise from changes in the demand for recreation, • the supply of water bodies and gaps in provision; • Ensure everyone can enjoy water environments.	
Environment Agency, The Wild Trout Trust and the Atlantic Salmon Trust South Coast Sea Trout Action Plan (2011)	
The Plan details a programme of work. Key actions are identified. Which include: Improve fish passage and habitat connectivity; Spawning habitat improvement; Protection of sea trout stocks; Protect and improve water resources and water quality; Mitigate the impact of climate change; Improve understanding of sea trout; Raise awareness	The WRMP24 operation may have the potential to impact on fish migration. The SEA will cover fish passage as an element of at least one sustainability objective
Mayor of London (2011), Securing London's Water Future The Mayor's Water Strategy	
This sets out the water challenges for London and actions needed to manage them. It calls for organisations involved in the city's water management • to invest in a water management and sewerage infrastructure system that's suitable for a world class city • support and encourage people to take practical actions to save water, save energy and save money off utility bills • work in partnership to manage flood risk Demand for water will increase due to population increases and higher seasonal rainfall and hotter summers mean water availability will decrease when required the most. London's supply-demand balance will become increasingly unsustainable and therefore action is required to balance supply and demand	The WRMP24 and SEA should take into account of the strategy and the need to balance water supply and demand whilst protecting the environment.
South Downs National Park (2013), Partnership Management Plan, Shaping the future of your south downs national park 2014-2019	
This is the five-year strategy for the management of the South Downs National Park. It provides a framework for the park wide local plan. Outcomes are under three headings: A thriving living landscape People connected with places Towards a sustainable future One of the outcomes compromises 'More responsibility and action is taken by visitors, residents and businesses to conserve and enhance the special qualities and use resources more wisely.	The WRMP24 may have the potential to affect the achievement of objectives. SEA will include objectives that take into account aspects such as landscape quality and character, historic and cultural features, habitats and biological diversity, climate change and better use of resources.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Environment Agency (2015), South West River Basin District, River basin management plan	
The purpose is to provide a framework for protecting and enhancing the benefits provided by the water environment. The plan sets out the current state of the environment, environmental objectives and identifies the measures to achieve the environmental objectives	The WRMP24 may have an effect on some of the RBMP objectives. The SEA should include objectives that take into account the objectives of the RBMP.
Environment Agency and Defra (2015), South East River Basin District River Basin Management Plan	
Reference is made to the environmental objectives of the WFD are: To prevent deterioration of the status of surface waters and groundwater; To achieve objectives and standards for protected areas; To aim to achieve good status for all water bodies or, for heavily modified water bodies and artificial water bodies, good ecological potential and good surface water chemical status; To reverse any significant and sustained upward trends in pollutant concentrations in groundwater; The cessation of discharges, emissions and loses of priority hazardous substances into surface waters; Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants. Environmental objectives are set for each of the protected areas and water bodies in the river basin district.	The WRMP24 may have an effect on some of the RBMP objectives. The SEA should include objectives that take into account the objectives of the RBMP where relevant (e.g. abstraction and WFD status).
Environment Agency (2016), South East River Basin District Flood Risk Management Plan 2015 - 2021	
This plan puts into place measures for preventing flooding from rivers, the sea, surface water, ground water and reservoirs over the 9 catchments and 1 flood risk area of the South East river basin district. Working with local councils, internal drainage boards, Highways England and lead local flood authorities to prevent, prepare and protect from flood risks.	The SEA should avoid increasing any potential flood threats or effects.
Environment Agency (2016), South West River Basin district Flood Risk Management Plan	
This sets out the measures to manage flood risk now and in the future. It will help to develop and promote a better understanding of flood and coastal erosion risk, provide information about the economic and environmental benefits to inform decision makers and identify communities with the highest risk of flooding to enable the targeting of investment.	The SEA should avoid increasing any potential flood threats or effects.

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Environment Agency and Defra (2016), Thames River Basin District River Basin Management Plan	
Reference is made to the environmental objectives of the WFD are: • To prevent deterioration of the status of surface waters and groundwater; • To achieve objectives and standards for protected areas; • To aim to achieve good status for all water bodies or, for heavily modified water bodies and artificial water bodies, good ecological potential and good surface water chemical status; • To reverse any significant and sustained upward trends in pollutant concentrations in groundwater; • The cessation of discharges, emissions and loses of priority hazardous substances into surface waters; • Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants. Environmental objectives are set for each of the protected areas and water bodies in the river basin district.	The WRMP24 may have an effect on some of the Thames RBMP objectives. The SEA should include objectives that take into account the objectives of the Thames RBMP where relevant (e.g. abstraction and WFD status).
Port of London Authority (2016) The Vision for the Tidal Thames	
The Thames Vision is a 20 year view of the river's future, developed with stakeholders with the goal of making the most of its potential, for the benefit of all. The Vision sees the value of the Thames better understood and its potential realised. The goals and priority actions are as follows: • Port of London: More trade, more jobs • Inland Freight: More goods off roads onto the river • Passenger Transport: More journeys • Sport and Recreation: More participants • Environment and Heritage: Improved tidal Thames environment • Community and Culture: More people enjoying the Thames and its banks	The WRMP24 may have the potential to affect the water environment and river levels and therefore access to the River Thames. The SEA should include objectives that take into account navigation, recreation and tourism.
Southern Water Business Plan 2020-25 (2019)Southern Water Environment Policy (2019)	
The Plan sets out a framework for Southern Water over the next five years to achieve their vision: "to create a resilient water future for customers in the South East". The vision is supported by five long term outcomes and five transformational programmes.	The SEA objectives will need to take account of the strategic programmes for achieving "a resilient water future."

Objectives identified in the Policy, Plan or Programme	Influences on the WRMP24 and the SEA objectives
Southern Water WRMP (2019)	
The Plan details the actions Southern Water will take to save and produce more water during a drought as well as outlining the actions customers and businesses will have to take. The supply of water in the Southern Water region comes from groundwater abstractions, river abstractions and reservoir abstractions. The Plan outlines the actions required across five key stages in a drought: Normal: No drought; Stage 1: Impending drought; Stage 2: Drought; Stage 3: Severe drought - phase 1; and Stage 4: Severe drought - phase 2.	The SEA objectives will need to take account of the approaches to drought-planning.
Southern Water WRMP19 2020-2070 (2019)	
The Plan sets out how Southern Water will secure reliable water supplies across each of the water resource zones (WRZs) making up its supply area over the next 50 years. It includes detailed proposals that take account of challenges they know already exist, and a range of future uncertainties. The WRMP19 adopts a 'twin track' approach to addressing the forecast supply-demand deficit, with demand management (including leakage reduction) options to reduce water demand within Southern Water's supply area being considered alongside the development of options to enhance reliable water supply availability.	The SEA objectives will need to take account of the investment commitments and strategies set out in the WRMP19 .
Water Resources Management Plans from adjacent water companies (2019)	
These set out the plans to manage water resources by companies in adjacent areas. These include: • Affinity Water • Portsmouth Water • South East Water • Sutton East Surrey Water • Bournemouth Water • Wessex Water • Thames Water	The WRMP24 should not conflict with the other water company operations and the SEA to take these into account in the cumulative effects assessment.

Appendix G Environmental Baseline

Introduction

Baseline data given below have been drawn from a variety of sources, including a number of the plans, policies and programmes reviewed as part of the SEA process. These sections also summarise the likely future trends for the environmental issues being considered (where information is available). The key issues arising from the review of baseline conditions are summarised in Section 3 of the main report.

Biodiversity, Fauna and Flora

Baseline

Biodiversity comprises the variety of plants (flora) and animals (fauna) in an area, and their associated habitats. The importance of preserving biodiversity is recognised from an international to a local level. Biodiversity has importance in its own right, and has value in terms of quality of life and amenity.

Designated Sites

There are a variety of sites that are designated at a European, national or local level as important for biodiversity, flora and fauna, falling within, or intersecting with, the study area. These include:

- 23 Special Protection Areas (SPA)[74] and 1 proposed SPA (Table F1)
- 51 Special Areas of Conservation (SAC)[75] and 0 proposed SACs (see Table F2)
- 18 Ramsar Sites and 1 proposed Ramsar site (Table F3)
- 564 Sites of Special Scientific Interest (SSSI)[76]
- 35 National Nature Reserves (NNR)[77]
- 281 Local Nature Reserves (LNR)[78]
- 14 coastline-related Marine Conservation Zones (MCZ)[79]
- 1 Biosphere Reserve (Brighton and Lewes Downs)[80]
- 24 National Character Areas (NCA)[81]

[74] Special Protection Areas (SPAs) are strictly protected sites classified in accordance with Article 4 of the EC Directive on the conservation of wild birds (79/409/EEC), also known as the Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species. www.jncc.org.uk

[75] Special Areas of Conservation (SACs) are protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites.

[76] Natural England now has responsibility for identifying and protecting the SSSIs in England under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000).

[77] NNRs are protected under Sections 16 to 29 of the National Parks and Access to the Countryside Act, 1949 and the Wildlife and Countryside Act, 1981.

[78] LNRs - places with wildlife or geological features that are of special interest locally.

[79] MCZs are designated offshore waters under the Marine and Coastal Access Act 2009 and protect a range of nationally important marine wildlife, habitats, geology and geomorphology.

[80] Biosphere Reserves are areas of terrestrial and coastal ecosystems promoting the conservation of biodiversity with sustainable use and serve to demonstrate integrated management of land, water and biodiversity.

[81] NCAs divide England into 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity, history, and cultural and economic activity.

Figure F1 shows the location of the European designated sites and Figure F2 shows the National designated sites.

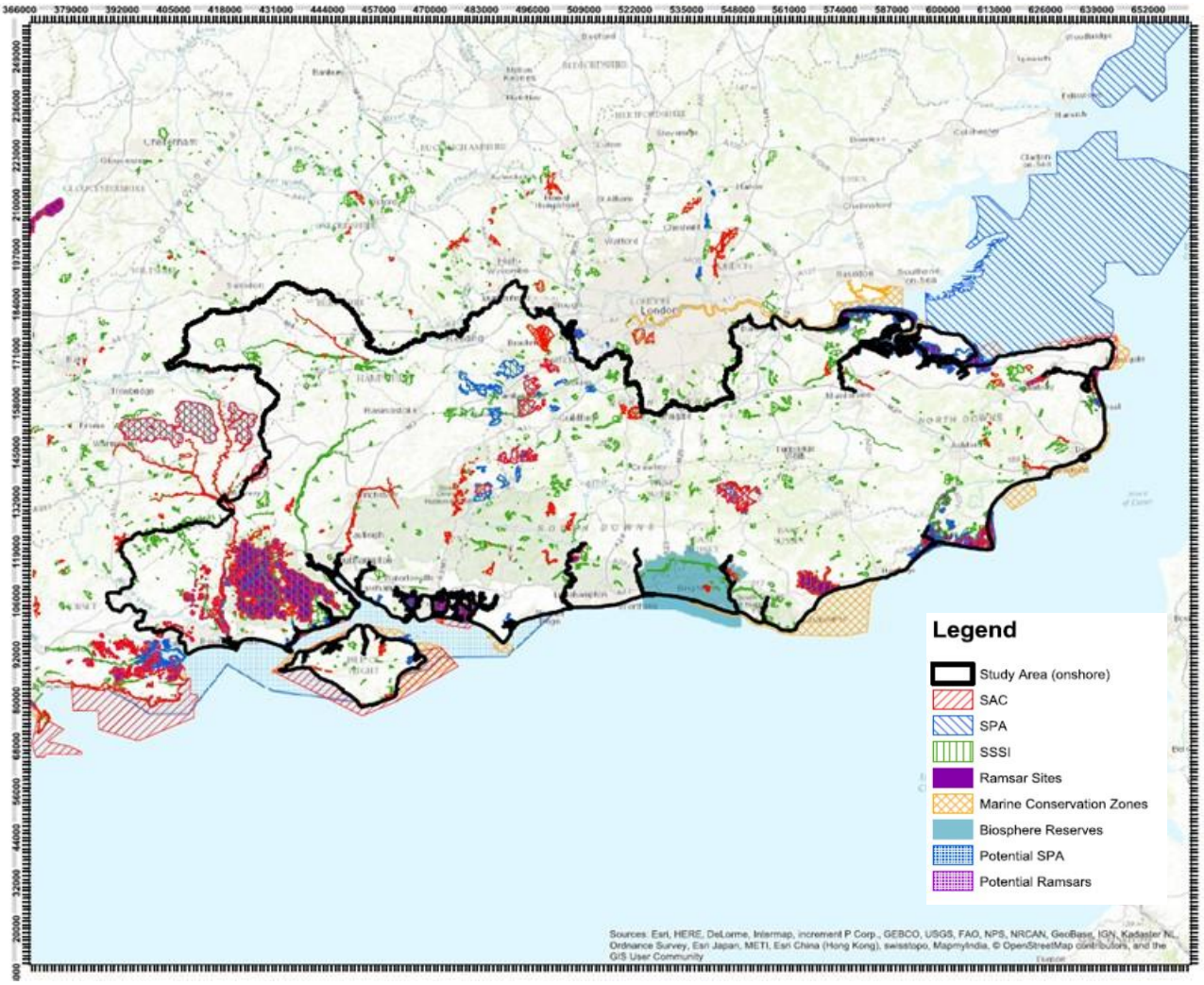
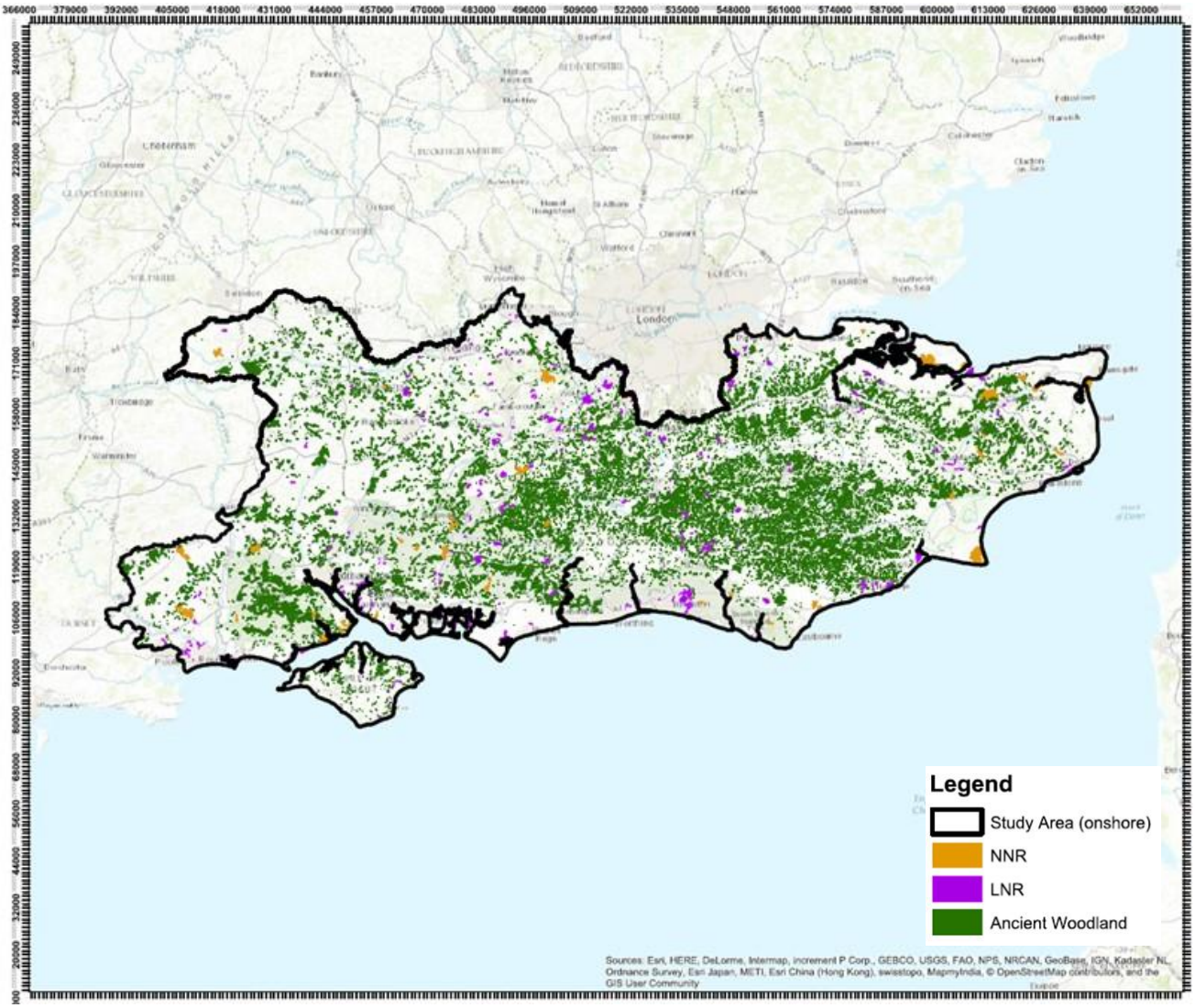


Figure F2 National Designated Biodiversity Sites



Achieving nutrient neutrality for new development in the Solent Region

Of specific relevance in relation to the WRMP24 is the potential for new developments coming forward to have a significant effect on internationally designated sites (Special Protection Areas, Special Areas of Conservation and Ramsar sites) due to the increase in wastewater.[82]

In 2018 and 2019 Natural England undertook a number of condition assessments of the features of the designated international sites around the Solent (the Solent Maritime SAC, Chichester and Langstone Harbours SPA, Portsmouth Harbour SPA, Solent and Southampton Water SPA) as well as the nationally designated SSSIs that underpin these international designations.

The condition of Chichester Harbour and associated Solent Maritime SAC, Chichester and Langstone Harbour SPAs have been condition assessed, with results summarised in the Chi Review NERR090.[83] Overall, the main intertidal habitats and bird features are assessed as unfavourable declining condition largely due to the continued loss of saltmarsh, the poor quality of saltmarsh and mudflat habitat, and the continued decline of several bird species (wintering and nesting). While the cause of these site specific declines in the Solent area are largely unknown there are possible links to the elevated nutrient loading.[84]

The uncertainty about the impact of excessive nutrients on designated sites needs to be recognised for all development proposals that are subject to new planning permissions and have inevitable wastewater implications. These implications, and all other matters capable of having a significant effect on designated sites in the Solent, must be addressed in line with Regulation 63 of the Conservation of Habitats and Species Regulations 2017.

In addition to the Solent, nutrient neutrality advice has been published and applies to wastewater within the Stour Catchment that effect Stodmarsh designated sites. In addition, Natural England is working with Southern Water via their Drainage and Wastewater Management Plan (DWMP) to assess the likelihood of sites failing their conservation objectives on water quality, have a hydrological link to wastewater discharges and where there is significant growth. These are areas where the need for a nutrient neutral methodology cannot be ruled out.

Achieving nutrient neutrality is one way to address the existing uncertainty surrounding the impact of new development on designated sites. Natural England (2020) have released advice on how to calculate nutrient budgets and options for mitigation.[85]

Priority Habitats and Species

Habitats designated under the Natural Environmental and Rural Communities (NERC) Act[86] within the area include rivers and streams (e.g. sensitive chalk rivers), reedbeds, fens, lowland raised bog, coastal and floodplain grazing marsh, saltmarsh, mudflats, coastal lagoons, water meadows, and estuary features. Important water-related NERC species that have been identified from baseline data in the area are listed below

(this list is not exhaustive).

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[82] Natural England (2020) *Advice on achieving nutrient neutrality for new development in the solent region*

[83] Natural England (2021) *Condition review of Chichester Harbour sites: intertidal, subtidal and bird features* (NERR090) [online] available at: http://publications.naturalengland.org.uk/publication/5535304204419072

[84] Ibid.

[85] Ibid.

[86] Species or habitats of principal importance for the conservation of biodiversity in England, identified in the Natural Environmental and Rural Communities (NERC) Act 2006 Section 41. Species can be protected without being included on the S41 species list; all bats in Britain are protected under Schedule 5 of the Wildlife and Countryside Act of 1981.

- Otter
- Water vole
- Atlantic salmon
- European eel
- Sea/Brown trout
- River lamprey
- White clawed crayfish
- Depressed River Mussel
- Desmoulins Whorl Snail
- Snipe
- Lapwing
- Daubenton's Bat
- Pipistrelle Bat
- Blunt-leaved Pondweed
- Rice Cut-grass

Ancient Woodlands

Ancient woodlands in England are important habitats that should be protected. An ancient woodland is any wooded area that has contained woodland continuously since at least 1600AD. They tend to be more ecologically diverse and of a higher nature conservation value than those developed recently, or where cover on the site has been intermittent. They often also have cultural importance. Areas of ancient woodland are shown on Figure F2 and there is approximately 1,200 km^2 within the study area, which makes up about 8% of the total area.

Water Framework Directive - ecological status

The WFD ecological status classification considers the condition of biological quality elements (e.g. aquatic invertebrates, plants and fish), the morphology of the habitat available in each water body (e.g. a defined stretch of river), and concentrations of supporting physico-chemical elements (e.g. oxygen or ammonia and concentrations of specific pollutants). See the 'Water' topic for details on water quality and ecological condition of water bodies.

Water abstraction and associated infrastructure can sometimes result in adverse effects on water-related sites. Impacts on biodiversity may be caused by the drying out of wetland habitats, lower water levels and slower flows in watercourse, deterioration in water quality, change in water temperature, or the transfer or proliferation of invasive species. The WFD South Eastern River Basin District Management Plan (RBMP) identifies barriers to fish passage as one of the major issues affecting the ecology of rivers in the South East River Basin District, some of which are related to abstraction impacts on migratory flow conditions and/or abstraction infrastructure (e.g. intakes or weirs).

Future Baseline

It is not expected that many additional sites will be designated under international or national legislation over the life of the WRMP24, with the focus therefore on achieving the conservation objectives set for each of these sites, and in a small number of cases in the area, the provision of compensatory habitat where development activities have led to an adverse effect on a European Site. Consideration should also be given to the uncertainty about the impact of excessive nutrients on the Solent. Where the WRMP24 has the

potential to impact upon European sites in this respect, Natural England's advice on achieving nutrient neutrality should be utilised.

A range of measures are included in the management plans for each site to contribute to these objectives and, assuming sufficient resources are in place, it is likely that the condition of these sites will improve over the next two or three decades to reach the objectives. These timescales recognise the time required for environmental changes to arise following positive interventions. A similar trend is likely for achievement of objectives associated with the NERC priority habitats.

The uncertainty about the impact of excessive nutrients on designated sites needs to be recognised for all development proposals that are subject to new planning permissions and have inevitable wastewater implications. These implications, and all other matters capable of having a significant effect on designated sites in the Solent and Stour Catchment, must be addressed in line with Regulation 63 of the Conservation of Habitats and Species Regulations 2017.

The number of locally designated sites may increase slightly in response to growing community activities and the development of local environmental initiatives. An improving trend in condition of these sites is also anticipated with greater resources (particularly voluntary resources) devoted to their protection and enhancement. It is acknowledged that there is a need to allow wildlife to adapt to the impacts of climate change.

The Natural Environment White Paper[87] identified the Government's aims to work to achieve more, bigger, better and less-fragmented areas for wildlife, including no net loss of priority habitat and an increase of at least 200,000 hectares in the overall extent of priority habitats and at least 50% of SSSI to be in favourable condition, while maintaining at least 95% in favourable or recovering condition.

More broadly, the White Paper and subsequent Government policy encourages partnership working by a wide range of organisations (including water companies where applicable) to take a catchment and/or landscape-scale perspective to the management of biodiversity, flora and fauna. Catchment-based approaches are likely to be increasingly taken with respect to the delivery of biodiversity and ecological objectives for water-dependent sites and species, with partnership working a key component of the delivery of improvement activities.

Climate change is likely to have an impact on wildlife in the future by exacerbating existing pressures such as changes to the timing of seasonal activity, and water scarcity. There is therefore a need to allow wildlife to adapt to climate change.

Table F1 Special Protection Areas (SPA) within the Study Area and intersecting with the Study Area boundary

Special Protected Area
Arun Valley
Ashdown Forest
Avon Valley
Chichester & Langstone Harbours
Dorset Heathlands
Dungeness, Romney Marsh & Rye Bay
Medway Estuary & Marshes

[87] Defra (2011) *The Natural Choice: securing the value of nature*. Natural Environment White Paper.

New Forest
Outer Thames Estuary
Pagham Harbour
Poole Harbour
Porton Down
Portsmouth Harbour
Salisbury Plain
Solent and Dorset Coast
Solent & Southampton Water
South West London Waterbodies
Stodmarsh
Thames Basin Heaths
Thames Estuary & Marshes
Thanet Coast & Sandwich Bay
The Swale
Thursley, Hankley & Frensham Commons (Wealden Heaths Phase I)
Wealden Heaths Phase II

Table F2 Special Area of Conservation (SAC) within the Study Area and intersecting with the Study Area boundary

Arun Valley
Ashdown Forest
Blean Complex
Briddlesford Copses
Buster Hill
Castle Hill
Chilterns Beechwoods
Dorset Heaths
Dungeness
East Hampshire Hangers
Ebernoe Common
Emer Bog
Folkestone to Etchinghill Escarpment
Great Yews
Hastings Cliffs
Isle of Wight Downs
Kennet & Lambourn Floodplain
Kennet Valley Alderwoods

Kingley Vale
Lewes Downs
Lydden & Temple Ewell Downs
Mole Gap to Reigate Escarpment
Mottisfont Bats
North Downs Woodlands
Parkgate Down
Peters Pit
Pevensey Levels
Pewsey Downs
Queendown Warren
River Avon
Richer Itchen
River Lambourn
Rook Clift
Salisbury Plain
Sandwich Bay
Shortheath Common
Singleton & Cocking Tunnels
Solent & Isle Of Wight Lagoons
Solent Maritime
South Wight Maritime
Stodmarsh
Tankerton Slopes & Swalecliffe
Thanet Coast
The Mens
The New Forest
Thursley, Ash, Pirbright & Chobham
Windsor Forest & Great Park
Woolmer Forest
Wye & Crundale Downs

Table F3 Ramsar Sites within the Study Area and intersecting with the Study Area boundary

Ramsar
Poole Harbour
Portsmouth Harbour
Pevensey Levels
Arun Valley
Avon Valley

Medway Estuary & Marshes
The Swale
New Forest
Pagham Harbour
Thames Estuary & Marshes
Chichester and Langstone Harbours
Stodmarsh
Thanet Coast & Sandwich Bay
South West London Waterbodies
Thursley & Ockley Bogs
Dungeness, Romney Marsh and Rye Bay
Dorset Heathlands
Solent & Southampton Water

Population and Human Health

Baseline

Population

The greater South East region is a densely populated part of the UK, with an estimated population of 9,180,135 in mid-2019.[88] Over the ten year period 2009 - 2019 the South East population increased by 8.1%.[89] The population is projected to increase to 9.5 million by 2028 (3.9% increase from the mid-2019 estimates).[90] Natural change (difference between births and deaths), net within-UK migration and net international migration are all positive for the South East. This is compared with other regions such as the North East and the South West where the growth rate is slowed down by negative natural change (more deaths than births). [91]

Water is supplied by Southern Water to around 2.6 million people, within 1.1 million properties.[92] In addition, the companies average daily water supply is 542 million litres. Waste water is supplied by Southern Water to

[88] Office for National Statistics (2020) *Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland* [online] available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland

[89] Ibid.

[90] ONS (2020) *Subnational population projections for England*: 2018-based - https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2018based#change-by-region

[91] Ibid.

[92] Southern Water (2020) *Annual Report 2020* https://southernwater.annualreport2020.com/media/2081/sw-what-we-do.pdf

around 4.7 million people, within 2 million properties.[93] The average daily wastewater recycled is 745 million litres.

Human Health

Health-related sustainability indicators are reported in the annual Public Health England Health Profiles.[94] In general, the health of the population is good for the South East with the healthy life expectancy for both men and women increasing during the period of 2017 to 2019, reaching 80.8 years for men and 84.3 year for women. Water is considered a vital resource that is managed carefully to ensure both that people have access to affordable and safe drinking water and sanitation. Data relating to air quality, which could also be affected by the WRMP24, and as a result affect health, are covered in the air quality section of this SEA Scoping Report.

Recreation and Tourism

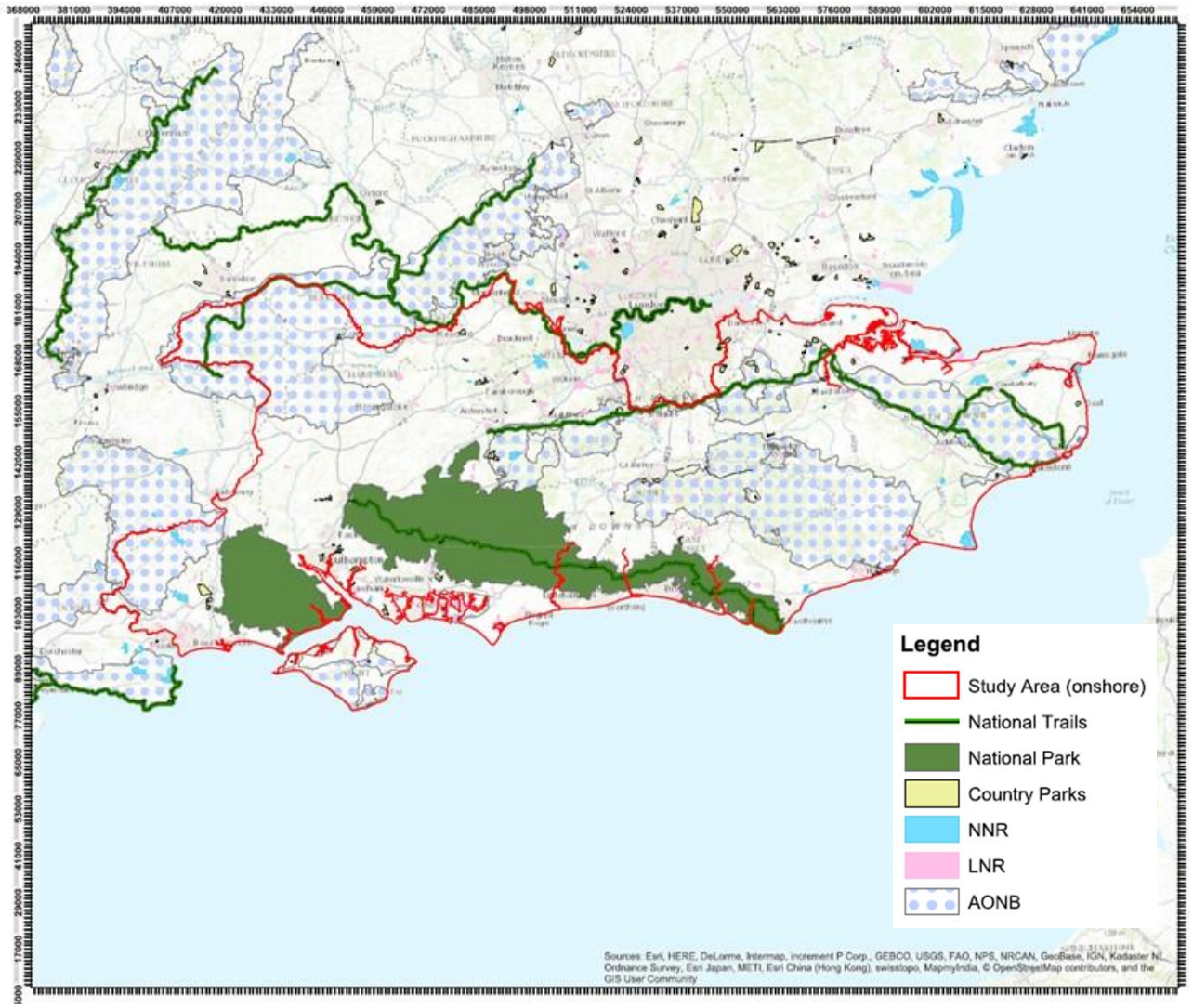
There were over 218 million domestic day visitors a day to the South East within 2019.[95] This led to expenditure of almost £8 million, making up 12% of total expenditure within the study area in 2019. Figure F3 shows some of the areas that may be used for recreation within, and intersecting with the study area. This includes National Trails, Areas of Outstanding Natural Beauty (AONB) (see Landscape and Visual Amenity topic), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) (see Biodiversity, Flora and Fauna topic). Southern Water's surface water reservoirs are accessible to the public and provide a range of recreation facilities, including bird-watching, walking, sailing or fishing. Some sections of rivers in the area are of particular importance with respect to navigation (e.g. the River Arun and Wey) and angling (e.g. River Test).

[93] Ibid.

[94] Public Health England (2020) *Local Authority Health Profiles* https://fingertips.phe.org.uk/profile/health-profiles/data#page/0/gid/1938132696/pat/15/par/E92000001/ati/6/are/E12000008/cid/4/tbm/1/page-options/ovw-do-0

[95] KANTAR (2019) The Great Britain Day Visitor 2019 Annual Report https://www.visitbritain.org/sites/default/files/vb-corporate/gbdvs_2019_annual_report_-_a.pdf

Figure F3 Recreation Resources



Public areas of open space, National Parks (see Landscape and Visual Amenity topic), country parks[96], Rights of Way, walking routes and cycle routes are also important with respect to recreation and tourism (e.g. South Downs Way national trail). The National Planning Policy Framework (NPPF) states planning policies should protect and enhance public rights of way and access. All Local Authorities are required to prepare and publish Rights of Way Improvement Plans (ROWIPs). These plans explain how improvements made by local authorities to the public rights of way network will provide a better experience for a range of users, including pedestrians, cyclists, horse riders, horse and carriage drivers, people with mobility problems, and people using motorised vehicles (e.g. motorbikes).

The NPPF defines green infrastructure as 'a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities' (including rivers and ponds). Local planning authorities are required to plan positively for strategic networks of green infrastructure, and take account of the benefits of green infrastructure in reducing the risks posed by climate change. The majority of LAs have therefore developed Green Infrastructure Strategies or Studies addressing these issues. Green infrastructure will often play a large part in local recreational resources.

Economy and Employment

The Greater South East region is a prosperous region of the UK and has relatively low rates of unemployment. The Greater South East region contributes around 14.5% of the total UK economy, and Gross Domestic Product (GDP) per head in the South East is £34,083, which is higher than the national UK average of £31,976.[97]

The South East region is one of the most densely populated and urbanised parts of the UK, where business services make up a significant proportion of the economy; however, agriculture is also one of the more important industries outside of Greater London.

Future Baseline

Population is projected to grow at a rate by 3.9% across the South East (9 years from 2019 to 2028)[98]. In response to recent studies access to the recreational resources, green spaces and the historic environment will have greater importance in future planning[99]. For example, the National Ecosystem Assessment and the Marmot Review, Fair Society, Healthy Lives, demonstrate the positive impact that nature has on mental and physical health and as a result the Government intends to establish a Green Infrastructure[100]. Partnership with civil society to support the development of green infrastructure in England. Improvements to the quality of the water environment and certain potential climate change impacts will present opportunities for an expanding tourist industry in the region[101].

Material Assets and Resource Use

[96] Area designated for people to visit and enjoy recreation in a countryside environment

[97] ONS (2020) *Regional economic activity by gross domestic product, UK: 1998 to 2018* https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/regionaleconomicactivitybygrossdomesticproductuk/1998to2018

[98] Office for National Statistics (2020*) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland* [online] available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland

[99] Defra (2011) *The Natural Choice: securing the value of nature*, The Natural Environment White Paper

[100] Green infrastructure is a term used to refer to the living network of green spaces, water and other environmental features in both urban and rural areas.

[101] Defra (2012) *The UK Climate Change Risk Assessment 2012* Evidence Report.

Baseline

Water Use

Southern Water supplies approximately 542 million litres of drinking water each day from its 84 water supply works along almost 14,000 kilometres of water mains to customers' taps.[102] In 2020, Southern Water achieved 99.95% (2019: 99.98%) compliance with the Drinking Water Inspectorate's (DWI's) water quality measures. Also in 2020, Southern Water's leakage was above target at 94 Ml/d (2019: 102 Ml/d). Although an improvement on 2019, the company's five-year target was missed, incurring a penalty of £2.7 million. This was due to the extreme weather of 2018 and 2019. Since then, a reduction of 15% has been seen, which aligns with outline commitments made for 2020 - 2025. In 2019-2020 Southern Water have also been able to limit the number of customers' properties at risk of experiencing low pressure to 203, which is well below the 257 target.

Moving into the next five year period to 2025, Southern Water will continue running a Catchment First programme, working with farmers and landowners to design and deliver solutions that address water quality at the source, which will deliver benefits to all.[103] Southern Water is actively pursuing measures to encourage its customers to reduce their water use and use water wisely, particularly in dry conditions, and made a commitment to customers in the business plan 2015-20 to achieve a 10% reduction (15 litres per person, per day) in average water use by 2020.[104] As the five-year period closed, an average water use of 126.5 litres per person was recorded, per day (2019: 129.9 litres). This is an improvement on 2018, when a long, hot summer led to a spike in consumption. It is also well below the target of 133.7 litres, and significantly lower than the UK average, which is still around 144 litres. Southern Water has invested significantly in installing water meters for a high proportion of its customers to encourage efficient use of water and it has an active programme to promote water conservation to both household and commercial properties. Water efficiency activity provides the greatest benefit to safeguarding water supplies: in 2020, 985,774 properties served by Southern Water were metered (approximately 90%).

Resource use and waste

There is an ongoing need for society to reduce the amount of waste it generates, by using materials more efficiently, and improving the management of waste that is produced. Waste in the South East region going to landfill has decreased by approximately 82% over the period 2008/9 to 2018/19 (1,975 thousand tonnes to 357 thousand tonnes).[105] Additionally, the waste sent to landfill was just 8.6% of total waste in 2018/19, compared to 45.6% in 2008/ 09. Household recycling rates in the South East have climbed to nearly 47% of waste generated (2018/19)[106], compared to 39.1% in 2008/ 09.

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[102] Southern Water (2020*) Southern Water Annual Report 2019 - 2020* https://www.southernwater.co.uk/the-news-room/the-media-centre/2020/july/southern-water-annual-report-2019-20

[103] Ibid.

[104] Ibid.

[105] Gov.uk (2020) Local authority collected waste generation from April 2000 to March 2019 (England and regions) and local authority data April 2018 to March 2019 https://www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables

[106] Ibid.

www.gov.uk/government/uploads/system/uploads/attachment_data/file/481060/LA_and_Regional_spreadsheet_2014-15_publication.ods

In line with the widely adopted 'waste hierarchy'[107], best practice for waste management is to reduce, re-use, recycle and recover, and only then should disposal (or storage) in landfill be considered. Data on waste arisings is collected in a range of categories. The activities of the water industry contribute to construction, demolition and excavation waste (CDEW), through construction of new infrastructure. The water industry also contributes to several waste streams through the operation of facilities. Waste streams include commercial and industrial waste (C&I) (statistics include waste arisings from the power and utilities sector, which includes water supply and sewage removal), and also hazardous wastes. Table F4 below shows waste according to waste type in England 2014 - 16, and percentage change by type. Table F4 shows that waste from CDEW has seen the greatest increase between the two years. Tables F5 and F6 provide further baseline information regarding waste.

Table F4 Waste generation split by responsible economic activity in England, 2014-16 (million tonnes)[108]

	Commercial and Industrial (C&I)	Construction, demolition & excavation (CDEW)	Households	Other	Total
2014	38.7	130.3	26.8	18.2	**214.0**
2016	39.8	136.2	27.3	17.7	**221.0**
Percentage change	3.0%	4.5%	1.9%	-2.8%	**3.3%**

Table F5 Waste from households in England - 2015 - 2018[109]

England	Waste arisings ('000 tonnes)	Recycled ('000 tonnes)	Recycling rate (%)
2015	22,225	9,849	44.3%
2016	22,770	10,217	44.9%
2017	22,437	10,139	45.2%
2018	22,033	9,840	44.7%

[107] Defra (2011) Waste Hierarchy Guidance https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69403/pb13530-waste-hierarchy-guidance.pdf

[108] UK Statistics on Waste https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918270/UK_Statistics_on_Waste_statistical_notice_March_2020_accessible_FINAL_updated_size_12.pdf

[109] Ibid.

Table F6 Municipal waste and Biodegradable Municipal Waste (BMW) to landfill in England 2015-2018[110]

England	Municipal waste to Landfill ('000 tonnes)	Of which BMW to Landfill ('000 tonnes)	BMW to Landfill as % of 1995 target baseline
2015	12,215	5,980	21%
2016	12,381	6,049	21%
2017	11,784	5,684	20%
2018	11,688	5,598	19%

Note: 1995 baseline for England 29,030,000 - no greater than 50% baseline by 2013 and 35% baseline by 2020.

Future Baseline

Southern Water aims to reduce leakage from its network over the next 25 years with several schemes planned to further reduce the amount of water lost through leaks. Southern Water has improved overall water resilience by reducing the volume of asset outage. However, it did not achieve the 2015- 20 five-year leakage target despite additional investment due to the unprecedented 2018 winter and droughts of 2018 and 2019. Nevertheless, since 2018 a reduction of close to 15% in the most stressed part of the region has been recorded, which is the committed reduction percentage for the next five-year period. Southern Water's aim is to place no restrictions on customer's water use, such as Temporary Use Bans, unless there are at least two dry winters in a row.

The Government's national aspiration is to reduce water usage to an average of 130 l/h/day by 2030. Southern Water is already meeting this aspiration with an average of 126.5 litres per person was recorded, per day for the year 2020. Furthermore, the number of metered households served by Southern Water is now up to 985,774 properties (approximately 90%).

There is the potential for increase in operational waste from the water sector as regional population increases and standards of treatment are increased through regulatory requirements. With the Waste Strategy for England, diminishing landfill capacity and a fast-growing waste recycling and recovery industry, the proportion of waste sent to recovery rather than landfill is set to continue to increase in the future. One of the Waste Framework Directive targets is for a binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2030.

The Government's first National Infrastructure Plan[111] (NIP) (2010) included visions to manage natural capital sustainably; treat water and waste in ways that sustain the environment and enable the economy to prosper; ensure a supply of water that meets the needs of households, businesses and the environment now and in

[110] UK Statistics on Waste
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918270/UK_Statistics_on_Waste_statistical_notice_March_2020_accessible_FINAL_updated_size_12.pdf
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/487916/UK_Statistics_on_Waste_statistical_notice_15_12_2015_update_f2.pdf

[111] HM Treasury Infrastructure UK (2010) *National Infrastructure Plan*

the future and deals with waste in accordance with the waste hierarchy. The plan was updated in 2016, setting out progress to date whilst including detailed delivery plans to 2021 in key economic sectors[112].

Water

Baseline

In the context of the WFD, the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. The aquatic environment of the South East and Thames River Basin has been characterised as part of the UK Government's reporting obligations to the EU under the WFD and this provides the most appropriate baseline reference[113]. The WFD brings together the planning processes of a range of other European Directives. These Directives establish protected areas to manage water, nutrients, chemicals, economically significant species, and wildlife, and have been brought in line with the planning timescales of the WFD.

The area is classified as water-stressed. All of the water that Southern Water supplies relies on rainfall, yet the South East is one of the driest regions in the country, with an average of 730 mm a year. The amount of rain in a year can vary widely from a maximum of 1,070 mm to a minimum of 340 mm.

Most of this rain falls between October and March and is critical to recharge groundwater each year. Rainfall during the rest of the year is usually taken up by plants, lost through evaporation or runs off the land. Southern Water has a variety of different water sources which react very differently to weather patterns.

Surface Waters: Rivers and Canals

The area under consideration lies within the South East River Basin District and partially within the Thames. The main rivers include the Test and Itchen in Hampshire, the Arun and the Western Rother in Sussex and the Medway and the Stour in Kent. River abstractions account for 23% of the Southern Water supply, most notably: the Medina and Eastern Yar on the Isle of Wight; the Test and Itchen in Hampshire; the Western Rother and Arun in West Sussex; the Eastern Rother and Brede in East Sussex; and the Teise, Medway and Great Stour in Kent.[114]

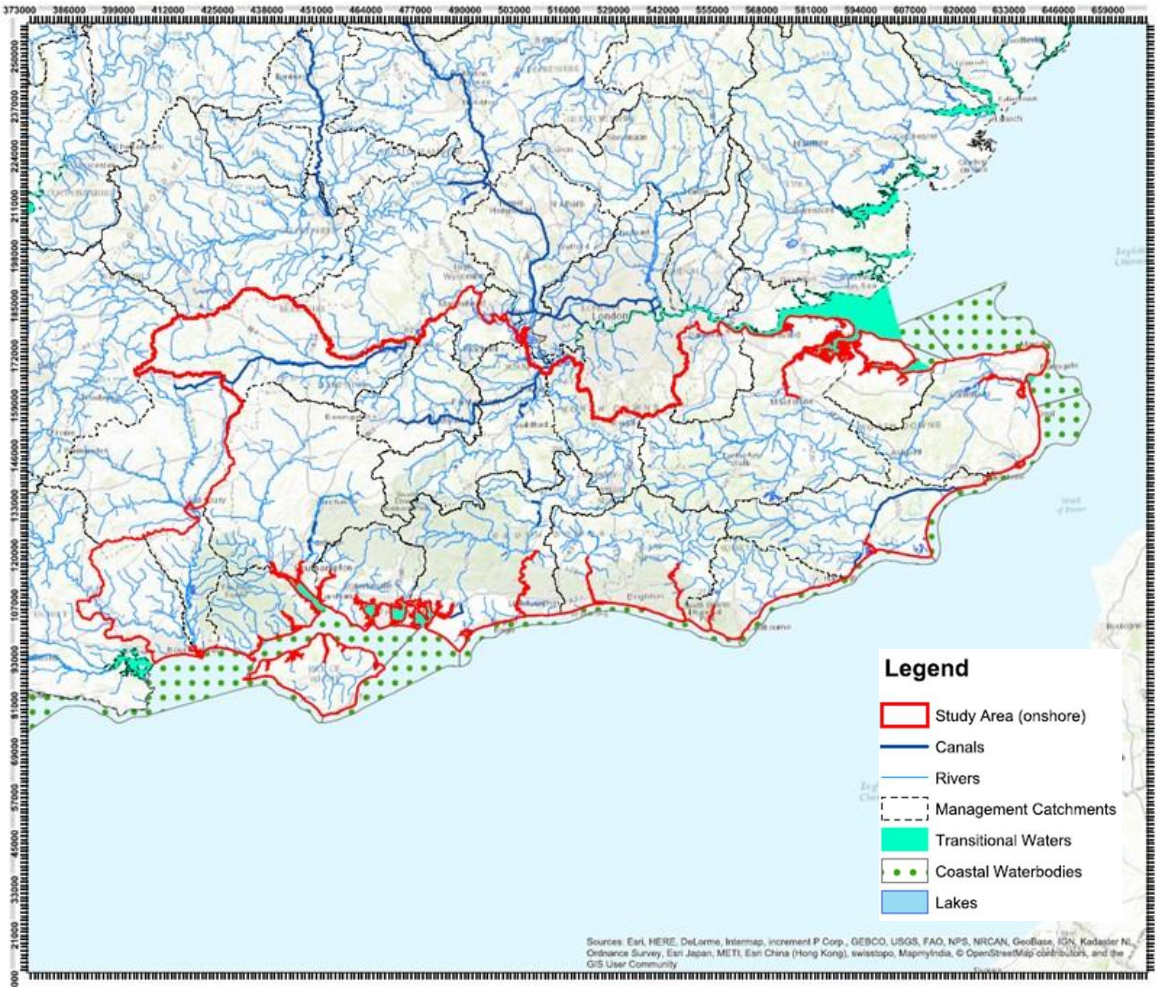
Surface water features within and intersecting the study area are shown in Figure F4.

[112] HM Treasury (2014) *National Infrastructure Plan 2016*: https://www.gov.uk/government/publications/national-infrastructure-delivery-plan-2016-to-2021

[113] Defra (2005) Water Framework Directive: Summary report of the characterisation, impacts and economics analyses required by Article 5, South East River Basin District

[114] Southern Water (2019) *Water Resource Management Plan 2019: Technical Overview* https://www.southernwater.co.uk/media/1332/dwrmp19-technical-overview.pdf

Figure F4 Surface Water Features



Surface Waters: Lakes and Reservoirs

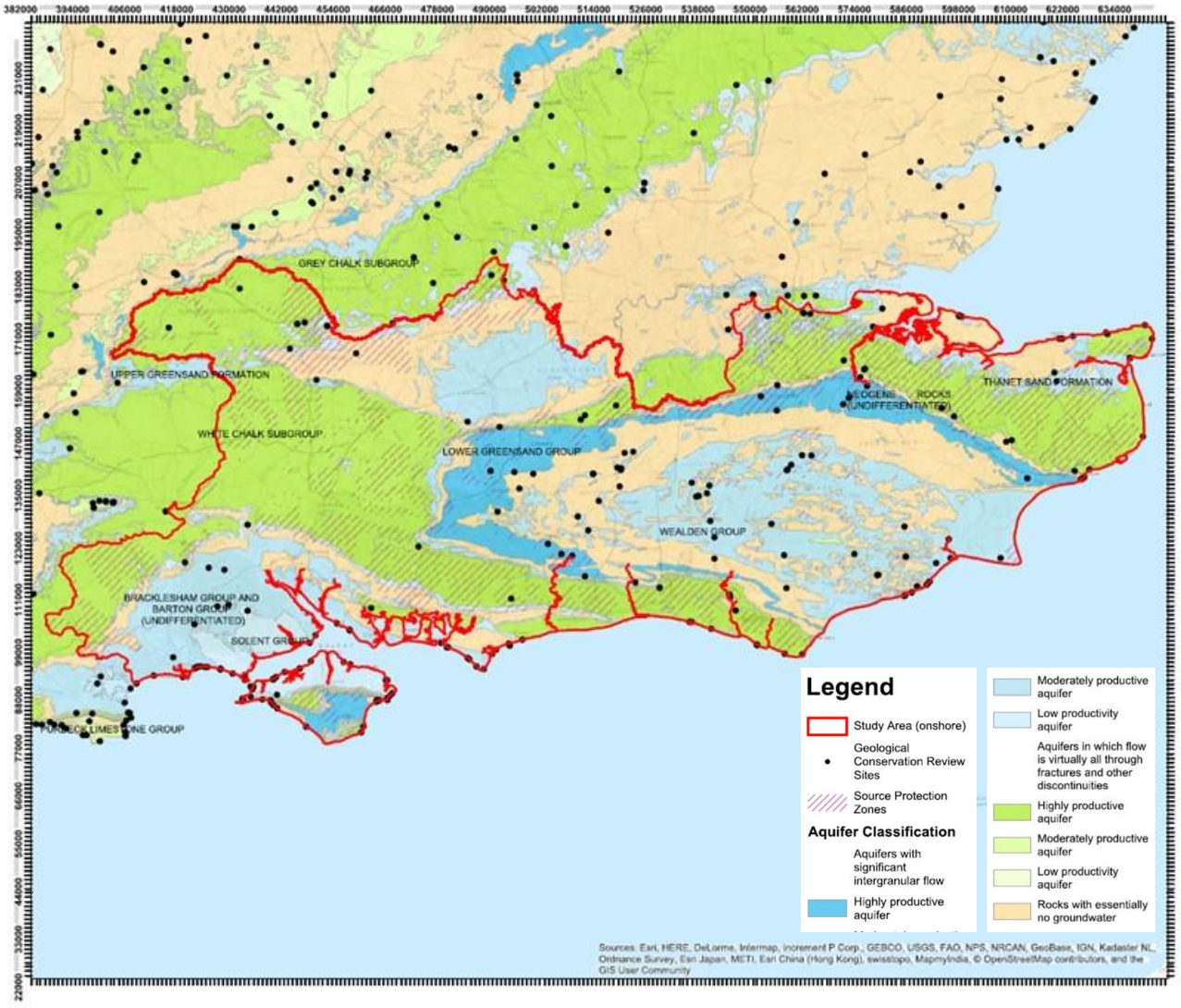
There are 28 lakes within the South East River Basin District, along with a small number of man-made reservoirs owned by various water companies. The four Southern Water surface water impounding reservoirs are responsible for 7% of Southern Water's supply: the largest is Bewl Water on the Kent/Sussex boundary, followed by Weir Wood, Darwell and Powdermill situated in Sussex. The total storage capacity of all the supply reservoirs amounts to 42,390 million litres (although South East Water are entitled to 25% of supplies from the River Medway Scheme which incorporates Bewl Water reservoir).[115] Ardingly, Arlington and Bough Beech reservoirs are also located in the area, but are owned and operated by other water companies.

Transitional and Coastal (TraC)

The South East River Basin District includes 23 estuarine ('transitional waters') and eleven coastal water bodies as shown in Figure F5.

[115] Ibid.

Figure F5 SPZs & WFD Groundwater Bodies



Catchment Abstraction Management Strategies

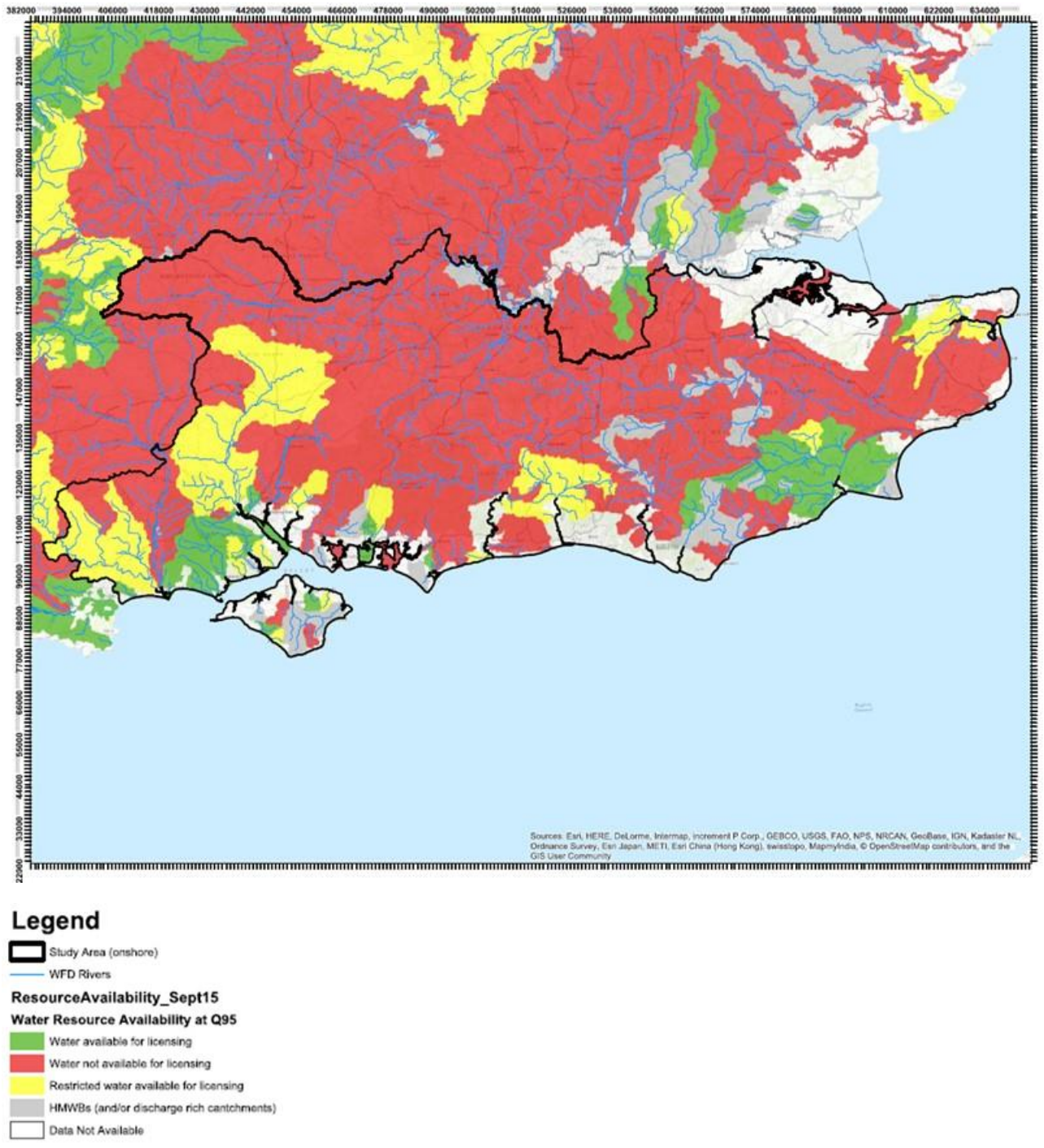
A national review of abstraction licences was undertaken by the Environment Agency through the CAMS (Catchment Abstraction Management Strategies) process in 2004. This has been updated in subsequent years where applicable and to align the assessment process with the WFD. The latest review was undertaken in 2013, and the outputs for each CAMS area are reported in a set of Abstraction Licensing Strategies.

The Environment Agency use the CAMS work to assess and understand water resource availability. A classification system has been developed to indicate the following:

- the relative balance between the environmental requirements for water and how much is licensed for abstraction;
- whether water is available for further abstraction; and
- areas where abstraction may need to be reduced.

The results have been mapped onto WFD Cycle 2 boundaries and are represented by different water resource availability colours showing the availability of water resource for further abstraction. Figure F6 shows the Environment Agency representation of resource availability based on the worst downstream water body at low flows (the flow percentile called Q95). It is apparent from Figure F6 that little surface water is actually available and the status of most rivers is identified as 'water not available for licensing' or 'restricted water available for licensing'.

Figure F6 Water Resource Availability



Water Framework Directive Classification

Since 2007, the health of water bodies has been classified according to several quality elements in line with the requirements of the WFD.

For surface waters, there are two separate status classifications for water bodies: ecological and chemical. For a water body to be in overall 'good' status both ecological and chemical status must be at least 'good'. Biological status classification considers the condition of biological quality elements, e.g. aquatic invertebrates, plants and fish, the morphology of the habitat available, concentrations of supporting physico-chemical elements (e.g. oxygen or ammonia and concentrations of specific pollutants).

The latest South East River Basin Management Plan (2015) shows that of 408 river water bodies within the area, with regard to their ecological status or potential, 5% were classified as 'bad', 24% as 'poor', 61% as 'moderate', 10% as 'good' and 0% as 'high'. 99% were classified 'good' for their chemical status (Table F7). In terms of the percentage of water bodies with 'good' or better ecological status in the study area, lakes were 29% (Table F8) and transitional water were 28% (Table F9).

Table F7 Ecological and chemical classification for Rivers 2015 - Southern Water Study Area

RBD	No. of water bodies	Ecological status or potential					Chemical Status	
		Bad	Poor	Mod	Good	High	Fail	Good
Thames	163	9	40	106	8	0	3	160
South East	214	10	55	127	22	0	2	212
South West	31	3	4	15	9	0	0	31
Total for Study Area	408	22	99	247	39	0	5	403

Table F8 Ecological and chemical classification for Lakes and Reservoirs 2015 - Southern Water Study Area

RBD	No. of water bodies	Ecological status or potential					Chemical Status	
		Bad	Poor	Mod	Good	High	Fail	Good
Thames	37	0	5	25	7	0	0	38
South East	29	1	3	15	10	0	0	28
South West	11	0	0	6	5	0	0	11
Total for Study Area	77	1	8	46	22	0	0	77

Table F9 Ecological and chemical classification for Transitional water bodies 2015 - Southern Water Study Area

RBD	No. of water bodies	Ecological status or potential					Chemical Status	
		Bad	Poor	Mod	Good	High	Fail	Good
Thames	8	0	0	4	4	0	0	8
South East	23	0	2	16	5	0	2	21
South West	1	0	0	1	0	0	0	1
Total for Study Area	32	0	2	21	9	0	2	30

Out of 67 groundwater bodies in the study area, 33 of them are classified as good for quantitative status (49%) and 36 for chemical status (54%) (see Table F10 below). The main reason for poor quantitative status is that abstraction levels, mainly for public water supply, exceed the rate at which aquifers recharge[116].

Table F10 Chemical and quantitative classification for Groundwater 2015 - Southern Water Study Area

No. of water bodies	Quantitative status		Chemical status	
	Poor	Good	Poor	Good
67	34	33	31	36

Flood Risk

Flooding can result from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources. The Environment Agency's Flood Risk Maps available on its website show what is at risk of flooding, including people, economic activity and natural and historic environment[117]. There are two defined high flood risk areas - the City of Brighton & Hove and the Medway area. These are areas where there is a significant risk of flooding from local sources, such as surface water, groundwater and ordinary watercourses, combined with a significant population at risk of the effects of flooding.

The extreme floods of 2007 prompted the Pitt Review (2008) and the subsequent Flood and Water Management Act 2010 which in part regulates the implementation of sustainable drainage systems (SuDS) to increase infiltration and reduce flooding from surface water runoff. Since 2008, the Government have

[116] Defra and The Environment Agency (2015), *South East River Basin District River Basin Management Plan*

[117] Environment Agency (2013) Flood Risk Maps - Risk of Flooding from Surface water - Thames River Basin District: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/456969/LIT8979_FloodRiskMaps_Thames_SurfaceWater_v2.pdf and South East River Basin District https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/456968/LIT8974_FloodRiskMaps_SouthEast_SurfaceWater_v2.pdf

further recognised the importance of investing in flood risk and coastal management. Most recently, in 2020 the Government announced its long-term plan to tackle the risks of flooding and coastal erosion.[118] The measures set out in the plan include an investment of £5.2 billion to create around 2,000 new flood and coastal defences to better protect 336,000 properties in England by 2027. The plan also includes £200 million for innovative projects such as sustainable drainage systems and nature-based solutions like temporary or permanent water storage areas which also boost wildlife. These will support 25 areas at risk of flooding to test and demonstrate innovative actions to adapt to a changing climate and improve their resilience. Of relevance to the study area, in Brighton, Hove, and Shoreham, £2 million will be spent to protect critical infrastructure on the south coast, including a power plant serving 300,000 homes and one of the largest cargo ports in the south of England. [119]

Climate change may have a significant effect upon future flood risk in the region. This is discussed further below and in the Air and Climate Change topic.

Coastal saltmarsh is an important natural resource and ecosystem service. Through reducing wave energy close to tidal defences, it can provide demonstrable flood and coastal risk management benefits, as well as supporting wildlife habitats and species of national and international significance. Saltmarsh habitat extent is conserved and enhanced through management measures driven in particular by the Habitats and Birds Directives and the WFD.

Future Baseline

Originally, the WFD set a target of aiming to achieve at least 'good status' in all water bodies by 2015. However, provided that certain conditions are satisfied, it was acknowledged that in some cases the achievement of good status may be delayed until 2021 or 2027. The primary objective in the short-term is to ensure no deterioration in status between status classes: the 2015 water body classification is the baseline from which deterioration between classes is assessed; no deterioration between status classes is permitted unless certain and specific conditions apply.

Climate change is considered likely to adversely impact on surface and groundwater resources over the longer term, with some modest impacts potentially arising over the medium term to 2040. The Catchment Flood Management Plans (CFMP)[120] assumes the following key trends:

- Milder wetter winters resulting in increases in peak river flows of 20%, meaning that flooding will happen more often and large scale severe flooding will be more likely to happen.
- More frequent, short duration intense storms in summer causing more widespread and regular flash flooding from overwhelmed drainage systems and some rivers.

[118] Defra (2020) *Multi-billion pound investment as government unveils new long-term plan to tackle flooding* https://www.gov.uk/government/news/multi-billion-pound-investment-as-government-unveils-new-long-term-plan-to-tackle-flooding

[119] Ibid.

[120] Environment Agency (2009) *South East River Basin District Catchment Flood Management Plans*. https://www.gov.uk/government/collections/catchment-flood-management-plans#south-east-river-basin-district

The NPPF[121] states that inappropriate development in areas at risk of flooding (in Flood Zone 1[122], Flood Zone 2[123], Flood Zone 3a[124] or Flood Zone 3b - the functional floodplain); should be avoided by directing development away from areas at highest risk. The NPPF requires that where development is necessary, it should be made safe without increasing flood risk elsewhere, as defined in the Technical Guidance to the NPPF[125].

The region is already water-stressed and projected economic and population growth will likely place further pressure on the region's water resources and water dependent environments. There is potential for an increased need for wastewater treatments as a result of WFD water quality standards combined with population increase. Given the energy intensity of wastewater treatment, the water industry CO2 emissions may increase and further contribute to climate change. However it is recognised that regulations and legislation will likely continue to promote the reduction in emissions through commitments to net zero. The water industry in the UK is aiming to become net zero by 2030.[126]

Soil, Geology and Land Use

Baseline

Geology

Geological sites maybe sensitive to changes in water quality, water levels (for example waterlogged deposits), pollution and land use practices. The study area is geologically diverse and includes a number of major aquifers including major chalk aquifers and interbedded sandstones and siltstones (see Figure F5 above).

Geological Conservation Review (GCR) sites have been highlighted, which relate to geological important sites, related to their scientific elements and understanding of earth sciences, which are important on a national and international level[127]. GCRs are also designated as SSSIs. Several geological SSSIs are found within the area, however some are not directly designated because of geology, although the geological variation does impact on the flora present. The main reason for a geological citation for an SSSI is related to disused quarries and geological important sites such as gravels and cliffs. There are 159 GCRs within the study area.

Soils

The majority of rural land in the study area is farmed, and it is noted that agricultural practices have a major influence on soil quality. Good soil structure is beneficial to water retention and crop yield. It can be seen from Figure F7 that the majority of agricultural land is classified as Grade 3 or higher. Soil quality and structure is affected by changes in land use, groundwater levels and farming practices. Soil quality can influence run-off rates and therefore flooding and water quality.

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[121] Department for Communities and local Government (2012) National Planning Policy Framework: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

[122] Low probability of river or sea flooding (<0.1%) which has critical drainage problems

[123] Medium probability of river (1%-0.1%) or sea flooding (0.5%-0.1%)

[124] High probability of river (>1%) or sea flooding (>0.5%)

[125] Communities and Local Government (2012) *Technical guidance to the National Policy Planning Framework*

[126] Water UK (2020) Water industry plans to reach net zero carbon by 2030 https://www.water.org.uk/news-item/water-industry-plans-to-reach-net-zero-carbon-by-2030/

[127] http://jncc.defra.gov.uk/page-2947

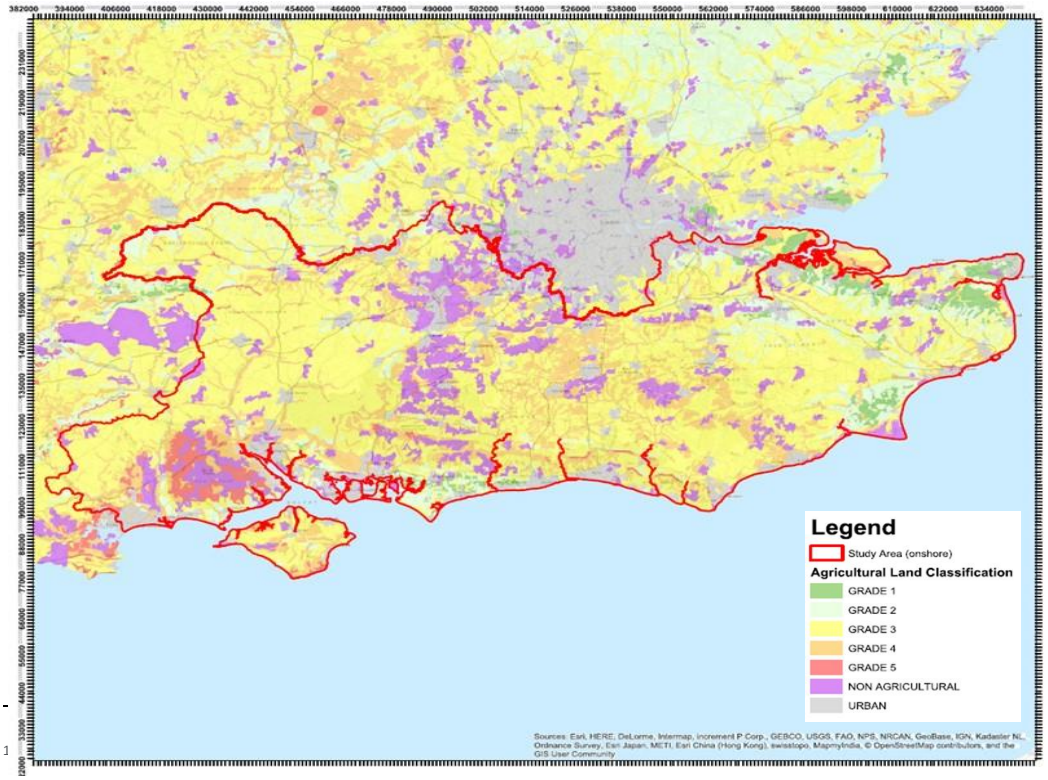
Future Baseline

The vision of Defra's Soils Strategy for England[128] is for all England's soils to be managed sustainably and degradation threats tackled successfully by 2030. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.

The Water White Paper described the Government's intentions to take forward a catchment-based approach to water quality and diffuse pollution and work towards Common Agricultural Policy reforms that will promote the farming industry's role as custodian of the natural environment[129]. The Water White Paper also identified that the strategic policy statement for Ofwat and revised social and environmental guidance would give a strong steer on Government support for approaches that offer good value for customers and the potential to prevent and manage future risks to drinking water quality. These policy objectives were reflected in development of catchment partnerships across England (including in the study area) to implement the catchment-based approach and in the support for catchment management schemes in the 2014 water company price review process for Southern Water and other water companies in the area.

One of the core planning principles of the National Policy Planning Framework (NPPF) is to encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value. The NPPF also places great importance with respect to Green Belt policy, the aim of which is to prevent urban sprawl by keeping land permanently open. Green Belt serves five purposes: to check the unrestricted sprawl of large built-up areas; to prevent neighbouring towns merging into one another; to assist in safeguarding the countryside from encroachment; to preserve the setting and special character of historic towns; and to assist in urban regeneration, by encouraging the recycling of derelict and other urban land. Although the NPPF promotes a presumption in favour of sustainable development, this does not apply where proposed developments may affect European or other designated sites covered by specific policies.

Figure F7 Agricultural Land Classification



[129] Defra (2011) *Water for Life - Water White Paper*

Air and Climate

Baseline

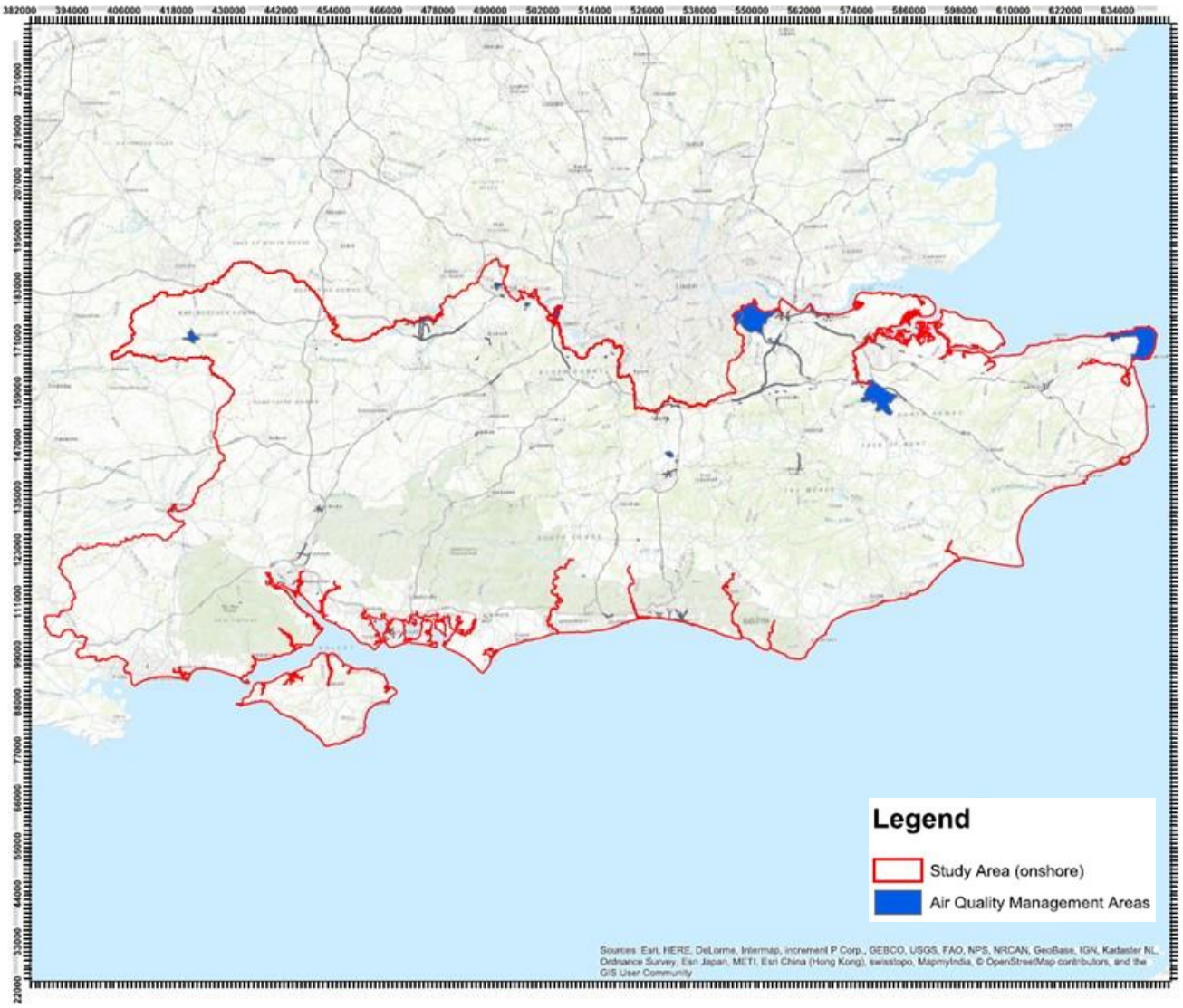
Local Air Quality

The baseline situation can be best described through reference to the local authorities that have declared Air Quality Management Areas (AQMA). A local authority declares an AQMA when UK National air quality objectives are unlikely to be met. The local authorities in the study area which have declared an AQMA within their boundaries are illustrated in Figure F8. There are 123 AQMAs in total within, and intersecting with, the study area. The majority of the AQMAs have been declared because of emissions from Nitrogen dioxide (NO2) and Particulate Matter (PM10).[130]

The Air Pollution Information System (www.apis.ac.uk) will be consulted during the assessment process to help understand the baseline risks of air pollution on habitats/sensitive and or designated sites.

[130] Defra List of Local Authorities with AQMAs https://uk-air.defra.gov.uk/aqma/list

Figure F8 Air Quality Management Areas



Greenhouse Gases and Climate Change

The predominant greenhouse gas of interest is carbon dioxide (CO_2). National and regional CO_2 emissions totals are provided in Table F11 and are apportioned to their source categories in Table F12.

Table F11 Carbon dioxide emissions by area (2018)[131]

Area	Annual CO_2 Emissions / million tonnes	Annual CO_2 Emissions (% of UK total)
South East	12.4	12.5%
South West	26.7	7.7%
East of England	32.4	9.4%
London	28.9	8.4%
UK	344.8	100%

Table F12 End-user carbon dioxide emissions by sector (2018)

Area	Percentage Contribution by Source Sector					
	Industry & Commercial % (millions tonnes)	Domestic % (millions tonnes)	Road Transport % (millions tonnes)	LULUCF* % (millions tonnes)	Total	Change from previous year
South East	27.4% (11.7)	31.3% (13.3)	46.1% (19.7)	-4.4% (-1.9)	42.7	-2%
South West	30% (8.2)	28.9% (7.7)	9.4% (2.5)	-3.0 (-0.8)	26.7	-2%
East of England	29.3% (9.5)	27.5% (8.9)	44.1% (14.3)	-0.6% (-0.2)	32.4	-1%
London	36% (10.4)	37.3% (10.8)	26.6% (7.7)	-0.34% (-0.1)	28.9	-2%
UK	38.6% (133.3)	28% (96.4)	36.8% (126.8)	-3.39% (-11.7)	344.8	-2%

* Land Use, Land Use Change and Forestry

Southern Water is one of the largest users of energy in the South East due to the significant amounts of energy needed to pump water and wastewater and treat it to high quality standards. In 2019-20, carbon emissions produced by Southern Water reduced; recorded at 189 kilotonnes of CO2e for 2019-20.[132] This is down from 200 kilotonnes in 2018-19. The reduction seen was principally due to the reducing greenhouse gas content in the power bought from the grid. Southern Water's 2020-2025 Business Plan sets a target level

[131] Department for Business, Energy & Industrial Strategy (2020) *UK local authority carbon dioxide emissions estimates 2018* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/894785/2005-18-local-authority-co2-emissions-statistical-release.pdf

[132] Southern Water (2020) *Annual Report and Financial Statements for the year ended 31 March 2020* https://www.southernwater.co.uk/media/3632/southernwater_ar2020-150720.pdf

of 24% total renewable energy electricity based on the efficient level.[133] The forecast performance for this measure in 2019-20 is 17.5%.

Forecast climate change is likely to influence processes within the hydrological cycle such as runoff and evapotranspiration. The impact of climate change on the water environment and water-related infrastructure is summarised in Table F13.

Table F13 Potential impact of climate change on the water environment and water-related infrastructure

Sector	Impact
Water Resources (i). water supply (ii). water demand	Reduction in yields, either in total or at certain times of the year. Increased evaporation losses from surface water stores Increased sediment and pollution runoff into watercourses. Increased risk of algal blooms and pollution in reservoirs. Increase in demands in summer months leading to increase in average and peak requirements. Increased pressure on treatment and distribution system. Increased requirements for agriculture.
Flood management	Increased riverine storm occurrence and flood risk. Improvements and higher specifications required for flood defences, urban drainage and rainwater disposal.
Water quality management	Lowered water quality in lowland rivers, with implications for instream ecosystems and water abstractions. Altered potential for polluting incidents. Increased potential for combined sewer overflows due to an increase in extreme storm occurrences.
Navigation	Lower summer flows leading to reduced navigation opportunities in rivers and canals.
Aquatic ecosystems	Altered habitat potential, with species at their environmental margins most affected.
Water-based recreation	Impacts through changes in river flows and water quality.

[133] Southern Water (2020) Our Business Plan 2020 - 2025 https://www.southernwater.co.uk/our-story/our-plans-2020-25/our-business-plan-2020-25

Adaptation to Climate Change

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report[134] presents the Government's second assessment of the risks and opportunities for the UK of the current and predicted impact of climate change, which follows on from the first report published in 2012. It draws primarily on an independent Evidence Report commissioned from the Adaptation Sub-Committee by the UK and the Devolved Governments.[135] The assessment findings indicate that the greatest need for early adaptation action (i.e. within the next 5 years) is in the following areas:

- Flooding and coastal change risks to communities, businesses and Infrastructure
- Risks to health, well-being and productivity from high temperatures
- Risks of shortages in the public water supply, and for agriculture, energy generation and industry
- New and emerging pests and diseases, and invasive non-native species, affecting people, plants and animals
- Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity
- Risks to domestic and international food production and trade

Future Baseline

Government and international targets indicate significant cuts in greenhouse gas emissions will take place by 2027. The UK is currently projected to meet its first three legislated carbon budget targets (until 2022)[136]. Southern Water commit through their latest Annual Report (2020) to focusing on reducing carbon emissions to get closer to net zero, in line with the Water UK Public Interest Commitment to achieve net zero emissions by 2030.[137]

Objectives are being achieved for many air pollutants (lead, benzene, 1,3-butadiene and carbon monoxide (CO)). Measurements also show that urban background and roadside particulate pollution (PM10) has shown long- term improvement, with stable concentrations observed from 2015 to 2019 for both roadside and urban background sites. A substantial network for fine particulate matter (PM2.5) has been operational since 2009 which shows a similar trend. [138]

In relation to NO2, urban background and roadside nitrogen dioxide (NO2) pollution has shown long-term improvement. There were also on average fewer hours of 'Moderate' or higher levels of nitrogen dioxide pollution in 2019 compared with 2018 at roadside sites. Public transport improvements, national air quality targets and European emissions standards for new vehicles should contribute to further reducing future air

[134] Defra (2017) *The UK Climate Change Risk Assessment 2017 Evidence Report* https://www.theccc.org.uk/uk-climate-change-risk-assessment-2017/

[135] Committee on Climate Change (2016) *UK Climate Change Risk Assessment 2017 Evidence Report* can be accessed at: www.theccc.org.uk/UK-climate-change-risk-assessment-2017/

[136] DECC (2015) *Updated energy and emissions projections 2015* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501292/eepReport2015_160205.pdf

[137] Southern Water (2020) Annual Report and Financial Statements for the year ended 31 March 2020 https://www.southernwater.co.uk/media/3632/southernwater_ar2020-150720.pdf

[138] Defra (2020) *Air Quality in the UK, 1987 to 2019* - Summary https://www.gov.uk/government/publications/air-quality-statistics/summary

quality impacts from motor vehicles. However new development, economic growth and tourism may lead to increased car journeys and congestion leading to localised air quality effects.

Urban background ozone pollution has remained fairly stable between 2003 and 2019 and rural background ozone pollution has shown no clear long-term trend.

The 2018UK Climate Projections (UKCP18 - which remain the most up-to-date projections currently available for the UK) estimate that summers in the south of England are likely, on average, to be hotter and drier which could affect the frequency and severity of drought events.[139]

Historic Environment

Baseline

Implementation of drought management measures could affect historic landscape character and historic structures associated with the water environment and the historical context of their setting. Archaeological remains are sensitive to changes in water quality, water levels (for example waterlogged deposits), pollution and land use practices. The study area is rich in heritage with listed buildings, scheduled monuments, conservation areas, registered parks and gardens, registered battlefields, protected wrecks and an internationally recognised World Heritage Site[140] (Canterbury Cathedral). Heritage designations within, and intersecting with, the study area is shown in Figure F9 and further detailed in Table F14.

[139] Defra, Department for Business, Energy and Industrial Strategy and The Environment Agency (2020) *UK Climate Projections (UKCP) 2018* https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index

[140] World Heritage Sites are places of international importance for the conservation of mankind's cultural and natural heritage. The World Heritage List was set up by the World Heritage Convention, established by UNESCO in 1972. www.english-heritage.org.uk

Figure F9 Heritage Designations

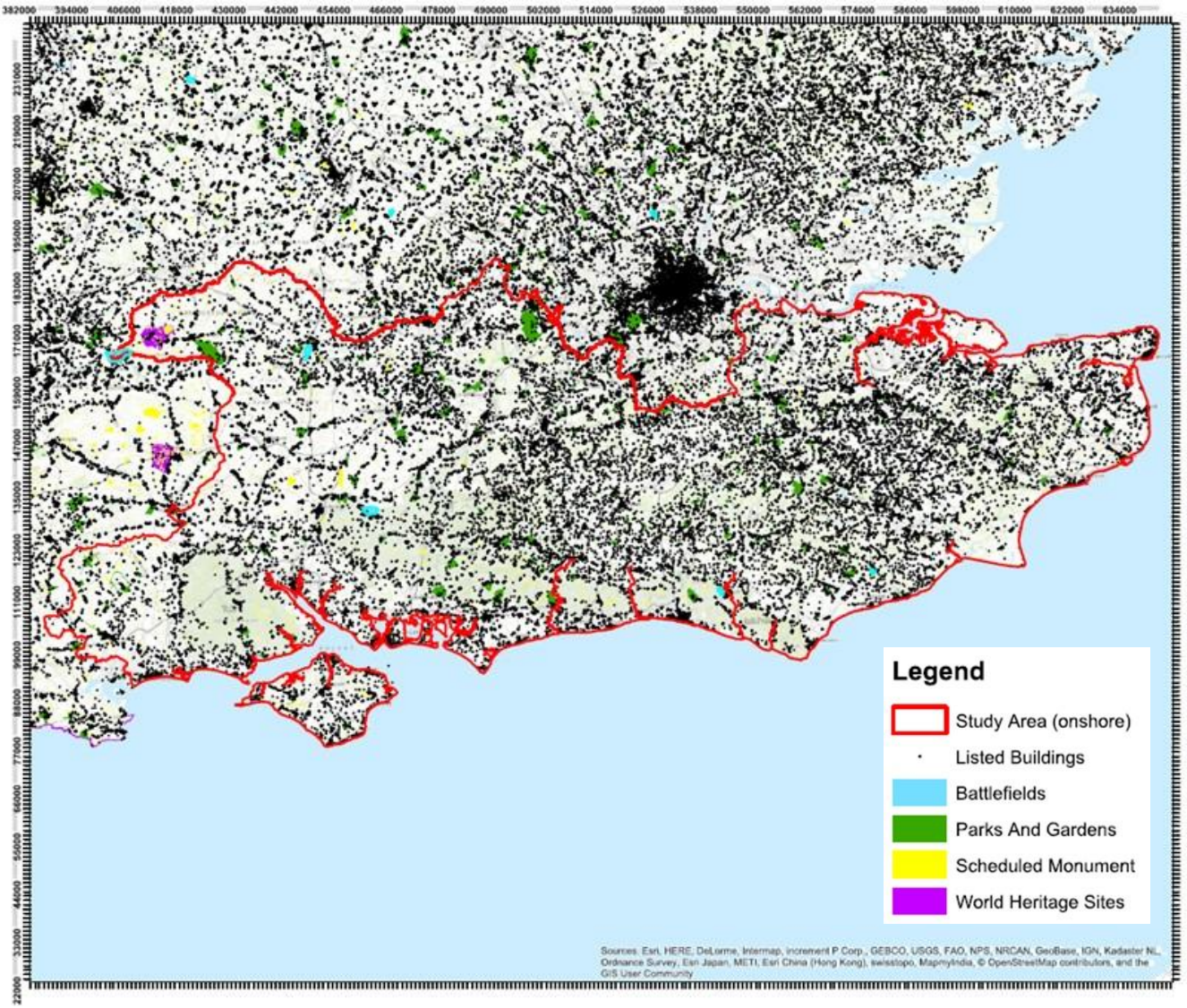


Table F14 Heritage assets within and intersecting with the study area

Asset	Description	Study Area
World Heritage Site	The United Nations Educational, Scientific and Cultural Organization (UNESCO) seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity.	2
Scheduled Monuments	Scheduled Monuments are protected under the Ancient Monuments and Archaeological Areas Act 1979. The monuments are scheduled and recorded through Historic England, based on national importance and covering a diverse range of archaeological sites. Scheduled monuments are often in a ruinous or semi-ruinous condition or take on the form of earthworks. More complete structures of national significance are usually protected as listed buildings.	2,732

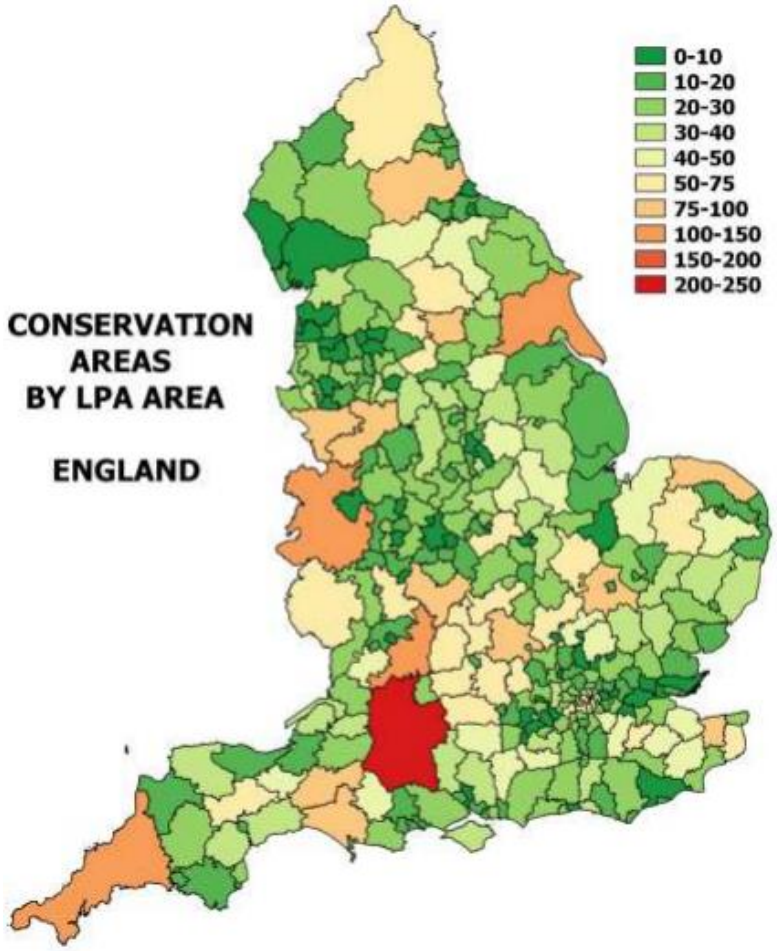
Listed Buildings	The statutory responsibility for listed buildings control lies with the individual Local Authorities. The Department for Digital, Culture, Media and Sport is responsible for compiling the statutory list of buildings of special architectural or historic interest and each building or structure of interest is classified under one of three Grades; I, II* and II depending on their significance (Grade I assessed as highest significance).	59,589
Heritage Coasts	Heritage coasts are 'defined' rather than designated. They were established to conserve the best stretches of undeveloped coast in England. A heritage coast is defined by agreement between the relevant maritime local authorities and Natural England.	5
Registered Historic Parks and Gardens	Historic England maintains a register of historic parks and gardens of special interest in England, these parks and gardens are as equally important as buildings and settlements and form part of an area's cultural heritage. However, unlike listed buildings and conservation areas, historical parks and gardens are not afforded legal protection within the UK. The registration of these historic parks and gardens is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the landscapes' special character.	305
Registered Historic Battlefields	Historic England holds a Register of Historic Battlefields. Its purpose is to offer battlefields protection through the planning system, and to promote a better understanding of their significance and public enjoyment.	5
Protected Historic Wrecks	The Protection of Wrecks Act (1973) allows the Government to designate a wreck to prevent uncontrolled interference. Designated sites are identified as being likely to contain the remains of a vessel, or its contents, which are of historical, artistic, or archaeological importance.	3

Conservation Areas are usually designated by the local planning authority, or Historic England (previously known as English Heritage). They are designated for their special architectural and historic interest. Conservation Areas can include historic town and city centres, fishing and mining villages, 18th and 19th century suburbs, model housing estates, country houses set in historic parks and/or historic transport links and their environment.

According to Historic England, there are approximately 10,000 conservation areas in England.[141] Data gathered in 2017 (Figure F10) shows the distribution of conservation areas by authority area. In terms of the study area, Figure F10 shows that the City of Canterbury is the only authority area with over 75 conservation areas present. The majority of the study area has relatively low conservation area presence when compared with the rest of the country.

[141] Historic England (2020) *Conservation Areas* https://historicengland.org.uk/advice/hpg/has/conservation-areas/

Figure F10 Conservation Areas by Local Planning Authority area (England)[142]



Individual local authority information will be used to identify specific conservation areas that may be affected by drought management measures.

Historic England collects data on buildings at risk. Within the region of London and the South East, there are currently 1,120 designated assets on the Heritage at Risk (HAR) register.[143]

Historic Environment Record (HER) databases linked to a Geographic Information System (GIS) are held by County Councils, District Councils or Unitary Authorities. They represent unique repositories of, and signposts to, information relating to landscapes, buildings, sites and artefacts spanning from the Palaeolithic period to modern times. Presenting this wealth of information for the study area would be difficult, however, it will be interrogated to assess whether any WRMP24 measures have the potential to affect such assets.

In relation to unknown assets, waterlogged conditions preserve waterlogged archaeological remains, such as wooden artefacts and structures such as trackways. Remains may be rain-fed or groundwater fed. If the

[142] Leo Hall (2017) A new inventory of English Conservation Areas http://www.bedfordpark.net/leo/planning/A%20new%20inventory%20of%20English%20Conservation%20Areas.pdf

[143] Historic England (2020) Heritage At Risk Register https://historicengland.org.uk/advice/heritage-at-risk/search-register/results/?advsearch=1&region=London%20and%20South%20East&searchtype=harsearch

latter, then clearly abstraction levels can be a critical factor in maintaining conditions in which preservation of the remains is viable. In addition, there are waterlogged deposits that are specifically associated with chalk, such as springs and their intimately associated wetlands which again can contain important archaeological information, especially palaeo-environmental evidence. Such water-dependent heritage assets will be considered when assessing potential WRMP24 measures.

Future Baseline

Recent and ongoing national economic difficulties may have a negative effect on removing heritage assets from the heritage at risk register. Climate change could have variable impacts on heritage assets in the future. Some types of assets and landscapes have already experienced and survived significant climatic changes in the past and may demonstrate considerable resilience in the face of future climate change. However, many more heritage assets are potentially at risk from the direct impacts of future climate change[144].

Landscape and Visual Amenity

Baseline

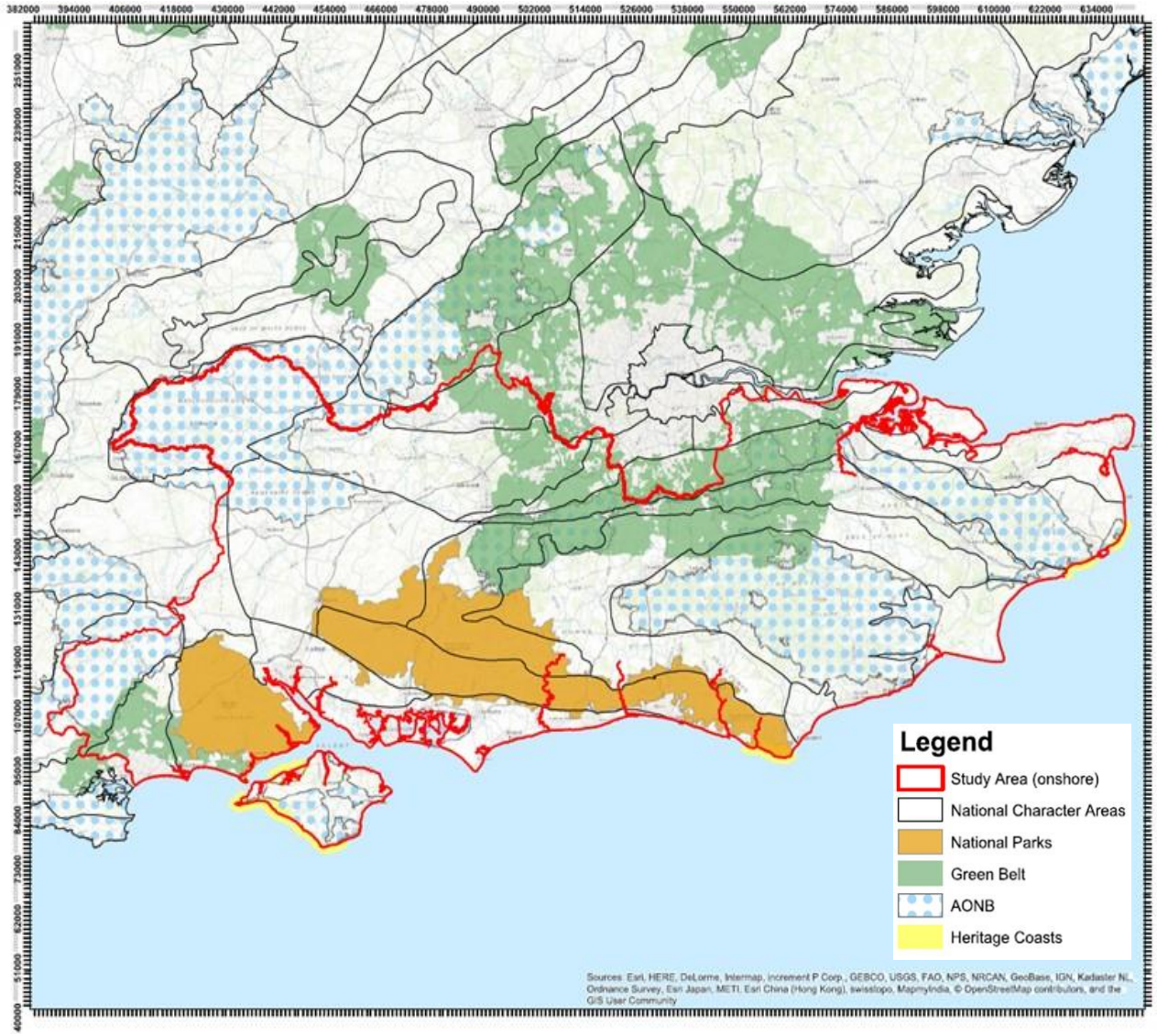
The landscape character network[145] defines landscape character as 'a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse'. Some landscapes are special because they have a particular amenity value, such as those designated as Areas of Outstanding Natural Beauty (AONB). Others may have an intrinsic value as good examples or be the only remaining examples of a particular landscape type. Some landscapes are more sensitive to development whereas others have a greater capacity to accommodate development. Assessments of landscape character and landscape sensitivity enable decisions to be made about the most suitable location of development to minimise impacts on landscapes.

Implementation of drought options has the potential to influence landscape and visual amenity, for example, effects on water levels in rivers beyond those occurring naturally as a result of the drought alone. Nationally designated landscapes (including AONBs, National Parks and Green Belt) and Natural England National Character Areas (NCAs) are shown on Figure F11 for the study area.

[144] English Heritage (2010) Climate Change and the Historic Environment

[145] www.landscapecharacter.org.uk

Figure F11 Landscape Designations



Nationally Designated Sites

AONBs are defined as ‘precious landscapes whose distinctive character and natural beauty are so outstanding that it is in the nation's interest to safeguard them’ . They are designated under National Parks and Access to the Countryside Act, 1949, strengthened by the Countryside and Rights of Way Act, 2000. The primary purpose of the AONB is ‘to conserve and enhance the natural beauty of the landscape.’ There are eight AONB within or partially within the study area, these are listed below and summarised in Table F15.

- North Wessex Downs
- Isle of Wight
- Chichester Harbour
- Surrey Hills
- Kent Downs

- High Weald
- Cranborne Chase & West Wiltshire Downs
- Dorset (part)

National Parks are areas protected due to their beautiful countryside, wildlife and cultural heritage. The New Forest National Park and South Downs National Park are located within the area. National Parks within, and intersecting with, the study area are detailed in Table F16.

The main characteristics of Green Belt is their openness and their permanence. The main aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open. The Green Belt therefore aims to check the unrestricted sprawl of large built-up areas; prevent neighbouring towns merging into one another; assist in safeguarding the countryside from encroachment; preserve the setting and special character of historic towns; and assist in urban regeneration, encouraging the recycling of derelict and other urban land. Green Belt areas are shown on Figure F11.

Natural England National Character Areas and Heritage Coasts

Natural England National Character Areas also take account of landscape (also referred to in the Biodiversity, Flora and Fauna topic). These are shown geographically in Figure F11, and Table F17 summarises their key features.

A Heritage Coast is a section of coast exceeding one mile in length that is of exceptionally fine scenic quality, substantially undeveloped and containing features of special significance and interest. They are agreed between Natural England and the local authority. These are five Heritage Coast areas shown geographically in Figure F11.

Tranquillity Areas

'Tranquillity' can be defined as the quality of calm that is experienced by people in places full of the sights and sounds of nature. The Campaign for Rural England (CPRE) developed tranquillity mapping for England to identify areas that are either disturbed or undisturbed by urban areas (towns and cities), traffic (road, rail and airports), power stations, pylons, power lines and open-cast mines[146].

Future Baseline

The pressures for housing in many parts of the study area, there are likely to be some threats to visual amenity more broadly beyond designated landscape areas (including within Green Belt). Climate change and land use change (e.g. due to agricultural reform associated with the UK's exit from the EU and Common Agricultural Policy) may also, in the longer term, lead to changes to landscape character.

[146] CPRE tranquillity mapping for England: http://www.cpre.org.uk/what-we-do/countryside/tranquil-places

Table F15 Areas of Outstanding Natural Beauty within, and intersecting with, the Southern Water Study Area

Name of AONB	Key Characteristics
Kent Downs	The Kent Downs AONB is a strip of rolling countryside that from Dover on the east coast of England and meets up with the Surrey Hills AONB. Crossed by 3 river valleys - the Darent, the Medway and the Stour. The AONB is orientated SE by NW and follows two ridge outcrops of greensand and chalk. This geology has an impact of the habitats above, and forms healthlands and acid woodlands, and grasslands, scrub and broadleaf woodlands respectively. The Archaeological characteristics of the area is very interesting, and the AONB holds the remains of many invasions of England. The area also is home to traditional Kentish orchards and hop gardens. The AONB is flanked by the urban areas of Ashford, Maidstone and Medway towns. The North Downs Way National Trail traverses the back of the escarpment.
North Wessex Downs	Includes the uplands of Marlborough, Berkshire and North Hampshire Downs. Richly farmed landscapes including Pewsey Meadows. Includes the Neolithic stone circle at Avebury and other important archaeological sites, as well as the White Horse of Uffington. Recreation resource - at Avebury, also Ridgeway National Trail and Kennet and Avon Canal.
Surrey Hills	Predominately made from chalk landscapes, open unimproved heath, deciduous woodland. Recreation resource - Box Hill and Devil's Punch Bowl, Greensand Way and North Downs National Trail, and 'Gateway to the South Downs' The urban areas of the area are predominately commuter towns, with transport links to Portsmouth and London
Isle of Wight	The Isle of Wight AONB is scattered across the Isle of Wight island, cropping up in the centre and south downlands, and paleontologically important coastline. The AONB is predominately located on the island's white, chalky upfolds, and include the famous sea stacks of the Needles, and also incorporates the salt marshes and mudflats of the heritage coast as well as chalk downland, arable farmland, wooded dairy pasture, small areas of heathland and hay meadows, sea cliffs and creeks. Four fifths of the island are rural farmland, which is typically heavily weighted to the grazing of sheep and cows. The island is a popular tourist destination, and the Isle of Wight coastal footpath and other trails run through much of the AONB.

Chichester Harbour	This AONB is composed of a series of tidal inlets that back onto the South Downs. Mudflats and saltmarshes in the area are home to around 55,000 birds. Many pretty villages are dotted along the coastline, which is also home to 12,500 boats. The village of Selsey boasts some fossil hunting locations. Other leisure activities in the area are those typically associated with the seaside.
High Weald	The AONB is composed of remote ancient woodland and patchwork fields which cover rolling hills of sandstone and clay, open heathland, descended of old hunting ground, and scattered farms and hamlets. The area is traversed by the valleys of the Rother, the Brede and the Tillingham rivers. The High Weald is home to many medieval and historically important landscapes. The area depends heavily upon agriculture and forestry, though several commuter towns do exist within its bounds.
Cranborne Chase and West Wiltshire Downs	Cranborne Chase is a chalky landscape with both rolling topography and steeply cut valleys. Wiltshire downs (to the north) consists of large ridges and elegant knolls. Ecologically important area as home to fens and river meadows, deciduous former hunting forests, and ancient downland. The AONB is home to a rich cultural history including C18 and C19 stately homes, ancient monuments and prehistoric archaeological sites. This AONB has a distinct lack of urbanisation, with the main industries being agriculture and forestry.
Dorset	The Dorset AONB is made up of inland ridges and valleys, and chalky ridge, limestone plateaus and sand heathland near the coast The Dorset coast is famous for its limestone and sandstone, geology that has formed famous landscapes of Durdledoor, Lulworth Cove and Chesil beach. This geology is often fossiliferous and contains important 185ma vertebrate fossils giving it its name of ‘the Jurassic Coast’, the first British Natural World Heritage Site. Inland, the heathlands and downlands are scientifically important and contain many SSIs, NNRs and rare flora and fauna as well as many archaeological sites, including the Iron Age fort of Maiden Castle. The area has a strong tourism industry with several million visitors a year, but the main industries are agriculture and mineral related.

Table F16 National Parks within the Southern Water Study Area

Name of National Park	Key Characteristics
New Forest	The New Forest National Park is includes one of the largest remaining tracts of unenclosed pasture land, heathland and forest in the heavily populated south east of England. It covers southwest Hampshire and extends into southeast Wiltshire and towards east Dorset.
South Downs	The South Downs National Park, covers an area of 1,627 km2 in southern England, stretching for 140 kilometres from Winchester in the west to Eastbourne in the east through the counties of Hampshire, West Sussex and East Sussex. The national park covers the chalk hills of the South Downs and a substantial part of a separate physiographic region, the western Weald, with its heavily wooded sandstone and clay hills and vales. The South Downs Way spans the entire length of the park and is the only National Trail that lies wholly within a national park.

Table F17 Natural England National Character Areas (NCAs) within the Southern Water Study Area

National Character Area Name	Key Characteristics
Chilterns	The Chilterns NCA is a predominantly wooded and farmed landscape with an underlay of chalk bedrock rising from the London Basin and offering wide views over adjacent vales. River Thames breaches escarpment to the south at Goring Gap, flowing past riverside towns such as Henley. The surrounding countryside is an area utilised for agriculture interspersed with woodland and hedged boundaries. Parts of Chilterns area furthest from London are recognised as special and attractive, falling within the Chilterns AONB. Major urban fringe and growth areas such as Luton and Hemel Hempstead are located within the Chilterns NCA, although outside of these AONBs.
North Kent Plain	The North Kent Plain is a strip of open, low and gently undulating land between the Thames Estuary to the north and the chalk of the Kent Downs to the south. It is a highly productive agricultural area with good quality soils used predominately for arable farming. Ancient woodland surrounds Blean, with additional woodland further west. Despite this, the landscape is mostly open and expansive, leading to the area being called as the “Garden of England”.

North Downs	Forming a chain of chalk hills, the North Downs NCA extends from Hogs Back in Surrey to the famous White Cliffs of Dover. The settlements in the area consist of traditional small villages and farms while twisting sunken lanes cut across the scarp and are a feature of much of the dip slope. The beauty of the area is reflected by its location within the Kent Downs and Surrey Hills AONB.
Thames Basin Lowlands	The Thames Basin Lowlands is a low lying plain situated within the London Basin between the suburbs of South Norwood and Hale, located on the Surrey/Hampshire border. Overall the landscape is largely flat, with small sections of gently undulating land. The underlying geology consists mostly of London Clay, with small outcrops of Bracklesham and Barton Group sand, silt and clay between Esher and Cobham. Part of the North Downs Chalk bedrock, fringed with Thanet Formation and Lambeth Group sediments, underlies Croydon and Sutton.
High Weald	High Weald NCA is covered by ancient countryside and cited as one of the best surviving medieval landscapes in northern Europe. It encompasses the ridged and faulted sandstone core of the Kent and Sussex Weald and comprises a mixture of fields, small woodlands and farmsteads with extensive connections to these areas through historic tracks and paths. The majority of the area (78%) is covered by the High Weald AONB with prominent medieval patterns of small pasture fields enclosed by thick hedgerows and shaws (narrow woodlands) remaining fundamental to the character of the landscape.
Low Weald	A broad area of low lying clay which wraps around the northern, western and southern edges of the High Weald. Mostly agricultural land able to support pastoral farming as a result of the heavy clay soils, although lighter soils can be found to the east. The landscape is predominantly covered by densely wooded areas with a large amount of ancient woodland. Approximately 9% of the NCA is situated within the adjacent designated Surrey Hills, Kent Downs and High Weald AONB with 23% of the land categorised as greenbelt.
Wealden Greensand	Around 25% of the area contains extensive belts of woodland, including ancient woods and more recent conifer plantations. Area also features open areas of heath on acidic soils, river valleys and mixed farming with areas of fruit growing. Over half of area covered by South Downs National Park, Kent Downs AONB and Surrey Hills AONB and serves as a significant place of interest for landscape, geology and biodiversity. Underlying geology has shaped the scarp-and-dip slope topography with clear links apparent between vernacular architecture, industry and local geology. The area accommodates a mix of internationally and nationally designated sites related to biodiversity, including 3 SPAs 2 RAMSAR sites and 8 SACs.

Thames Valley	Majority of the landscape is urban with low lying land situated within a wedge shaped area. It widens from Reading, including Slough, Windsor, the Colne Valley and the southwest London Fringes. Hydrological features are the most prominent within the area and include the Thames and its tributaries, the Grand Union Canal and the reservoirs which form the South-West London Waterbodies SPA and Ramsar site. These features are vital for providing water supply services to London and surrounding suburbs whilst also being crucial for wildlife and recreation. Due to the flood risk, flows and water levels in the River Thames are managed upstream of Teddington. Both flood defence and water quality improvement techniques enhance opportunities for biodiversity and recreation throughout the NCA.
Berkshire and Marlborough Downs	A vast area containing arable fields stretching across rolling Chalk hills with scattered settlements. The escarpment provides wide views of the Berkshire and Marlborough Downs with visible landmarks including chalk-cut horse figures, beech clumps and ancient monuments. Avebury stone circle is a popular visitor destination and part of a World Heritage Site, with numerous other Scheduled Monuments and heritage features across the landscape, although Heritage features are at risk from damage by cultivation and animal burrowing.
Salisbury Plain and West Wiltshire Downs	An area dominated by its gently rolling chalk downland which forms part of the sweep of Cretaceous Chalk spanning the Dorset coast and across the Chilterns to north of the wash. The area is sparsely populated with a main focus on agriculture. There are few settlements, leading to a vast, open landscape and a strong sense of remoteness The plain is predominantly covered by its chalk grassland, one of the largest remaining areas of calcareous grassland in north western Europe The area is well protected with SPA, SAC and SSSI designations due to its rich populations of stone curlew, hen harrier and rare bumblebee species
Greater Thames Estuary	A largely remote and tranquil landscape between the North Sea and rising ground inland, consisting of shallow creeks, drowned estuaries, mudflats and broad tracts of tidal salt marsh. Despite proximity to London, the NCA only has a few major settlements and small villages towards the higher ground. It contains some of the most scarcely populated sections of the English coast and is vastly different to the densely populated urban areas towards London. Sea defences protect large areas of reclaimed grazing marsh and its associated ancient fleet and ditch systems, and productive arable farmland. Historic military landmarks are characteristic features of the coastal landscape.

Hampshire Downs	Part of the central southern England belt of chalk, the Hampshire Downs rises 297m in the north-west and is located on the Hampshire-Wiltshire border. A steep scarp to the north delineates the Downs. The area overlooks the Thames Basin the Weald to the east. It is characterised by its elevated, open and rolling landscape covered by large arable fields with low hedgerows on thin chalk soils, scattered woodland blocks and shelterbelts. The Chalk is a large and important aquifer; hence groundwater protection and source inerrability designations cover most of the area. Catchment sensitive farming to control pollution, run-off and soil erosion is a vital activity. The aquifer feeds a number of small streams flowing north and east, although the dominant catchments are those of the rivers Test and Itchen, which flow in straight sided with relatively deeply incised valleys across most of the area. The Itchen is a SAC and the Test a designated SSSI. These rivers, with the watermeadows, peat soils, mires and fens of their flood plains, are the most important habitats of the area. The valleys are home to the main settlements, the local road system and important economic activities such as watercress growing and fly fishing.
Isle of Wight	The Isle of Wight is a 380 km^2 island separated from the south coast of England by the Solent. It is comprised of packages of farmed arable coastal plains, pastures and woodland, steep chalk downs, diverse estuarine seascapes and dramatic sea cliffs and stacks, such as the needles. The island is scientifically very important. Almost half of the island falls into an AONB, there are 41 SSSI and 395 SINCs, several dark sky observation areas and Special Protection Areas, home to wetland birds, rare invertebrates and rare plants. The geology of the island is diverse, but it is mainly dominated by Paleogene and Cretaceous sediments, often partly comprised of extremely well preserved dinosaur fossils. There are many important bronze age, iron age, and roman archaeological sites are found on the Isle of Wight The predominately rural island also bears host to popular seaside resorts, post-medieval towns, all attracting many tourists to come and visit and try a wide range of leisure activities.

New Forest	The New Forest NCA, spanning from the lower Hampshire Avon Valley to industrialised Totton and Fawley is predominately comprised up by the New Forest National Park. The area is a lowland plateau, geologically comprised of Paleogenic deposits overlain by Quaternary gravels, and is home to some bronze age (and onwards) archaeological sites. The areas soils are acidic leading to unique European site habitats. The ancient area has been retained largely due to its designation as a William the Conqueror's royal hunting forest, the survival of grazing as part of a pastoral tradition, ancient Forest Law and more recent conservation policies. The centre of the NCA is comprised of open heathland and woodland where wild pigs and wild horses roam free through ancient oak and beech trees. Major urban areas are located at Ringwood, Fordingbridge and Lymington around the edge of the National Park, and large villages within it, notably Beaulieu, Brockenhurst, Burley, Lyndhurst and Sway. In the south-east the ancient Borough town of Christchurch (in Dorset) has spread to the east, over the Avon, extending in a large area of suburban housing along the coast to New Milton.
Pevensey Levels	This predominately rural NCA is a low-lying area is situated in East Sussex between Eastbourne and Bexhill. Over a third of the area is a SSSI and the entire area is a wetland of national and international conservation importance. The south east border is a long coastline of shingle beaches with a huge system of sea defences due to Pevensey Level's high vulnerability to the effects of climate change. The NCA is framed by the steep scarp of the South Downs in the west and the higher ground of the High Weald in the north, with views of the English Channel to the south. The busy Victorian seafront of Eastbourne is the main settlement, attracting over 5 million visitors each year.
Romney Marshes	Romney Marshes are a low reclaimed marshland stretching from large shingle beaches, mudflats and coastal habitats of the English Channel over marshland and arable and grazing land to Hythe, Kent and Pett, Sussex. This have been anthropogenically modified via the use of drainage channels, gravel digging, military activity and tourist amenities. The area is scientifically important, and is a SAC, SPC, SSSI and proposed Ramsar site, as well as being home to some of the UK's rarest species. The NCA acts as a corridor between other important habitats, such as the High Weald and the valleys of Rother and Brede

South Coast Plain	The South Coast Plain is a flat coastal landscape nestled between the dip slope of the South Downs and South Hampshire lowlands and the English Channel, the Solent and Southampton Water. The area is significantly urbanised, and hosts the site of the Portsmouth conurbation and a handful of large seaside towns which heavily rely on protection from the sea. The economies of these areas are intricately linked to marine and recreational activities. A very small percentage of the South Coast Plain is comprised of SSSIs. The area also hosts four SPAs, two SAC and four Ramsar sights. Despite the urban build up, the coastal area feels wide and open. The Isle of Wight can be seen from many places along the South Coast Plain.
The South Downs	The striking open rolling chalk hills and the remote woodland of the South Downs stretches across a spine of chalk from the Hampshire downs on the west and coastal cliffs of East Sussex in the East. The area is only eight percent urbanised, although the rest of the NCA is largely influenced by agriculture and forestry. The South Downs Way National Trail stretches along the back of the northern scarp, and attracts many cyclists, hikers and horse riders. The Cretaceous chalk of the South Downs is very permeable and absorbs much of the rain in the NCA, replenishing the chalk aquifer below. This aquafer is often under stress as it supplies Brighton and surrounding areas. The coast of the South Downs often hosts a cliffy landscape, and a small portion of the NCA is recognised as heritage coast.
South Hampshire Lowlands	The South Hampshire Lowlands NCA stretches from Hampshire and the South Downs to Southampton Water. The large urban area of Southampton and its surrounding areas fills just under a third of the NCA. Otherwise the area is comprised of farmland, wetland and woodland. Much of this woodland is ancient, a legacy of the Forest of Bere, a Royal Hunting Forest that once spanned area. This woodland can be seen at West Walk near Wickham, Botley Wood at Swanwick and Ampfield Wood near Romsey. The mudflat and salt marsh wetlands of the area are home to breeding and overwintering waterfowl and waders. Three Habitats' sites cover parts of the area. The delicate and unique river areas of this NCA are home to otters. The geology of the South Hampshire Lowlands is mainly consisting of open marine, estuarine and freshwater Tertiary deposits.

Thames Basin Heaths	The Thames Basin Heaths covers westwards from Weybridge, Surrey to the countryside around Newbury in Berkshire. The London greenbelt incorporates countryside around Chobham and the River Wey and River Mole. The NCA housing the large urban conurbations of Bracknell and Camberley and the large M25 and M3 road network. Away from London, the settlement pattern is a mix of dispersed hamlets, farmsteads and houses interspersed with villages, and as well as parkland, ancient woodland and semi-natural grassland. A quarter of the NCA is woodland, with the majority planted on former heathland, commonly comprised of rhododendron and conifers. Common land is found across the NCA on deposits of Tertiary sands and gravels, leading to only rough pasture. Other land uses include military bases such as Aldershot, and plantations. Wilder areas are formed by wet and dry heathland, and are of international importance and are protected by SSSI and SAC statuses. These areas provide habitats for nightjars, Dartford warblers and woodlarks. Due to their proximity with urban settlements these areas often suffer from fly tipping and arson.
Blackmoor Vale and the Vale of Wardour	To the south of this NCA there is Upper Greensand Terraces and a wide expanse lowland clay vale. The NCA expands to the north to the edge of Salisbury Plain and West Wiltshire Down NCA. The fertile area of the terraces is the site of several stately homes and their estates of parks and woodland. Blackmore vale has many veteran hedgerow trees and hedgefields which often become waterlogged due to the pattern of overlapping rivers and streams. Urban areas comprised of large towns (e.g. Sturminster Newton and Gillingham) making the area 1% urbanised, many small towns, villages and hamlets, some of which are medieval. Disused quarries show the Jurassic and Cretaceous geology of the area.
Dorset Downs and Cranbourne Chase	Spans within the counties of Dorset, Wiltshire and Hampshire. Heavily agricultural NCA due to large open arable and pasture fields. The NCA is very rural with a low population density. The largest towns are Dorchester and Blandford Forum. The NCA is also blanketed by pockets of woodland, with the entire area overlaying Cretaceous chalk. The area is archeologically important and shows evidence of Mesolithic activity (8000 years ago). 15km long transect of the South West Coast Path National Trail runs through this NCA.

Dorset Heaths	This NCA overlaps the towns of Poole, Bournemouth and Christchurch. The area is scientifically important, and contains a number of SPAs due to the presence of rare reptiles, insects, birds and heathland. Major land uses include agriculture, military training and open cast mineral working. Tourism is a major industry within the area, attracting visitors to archetypical sandy beaches.
Inner London	The Inner London NCA lies at the centre of the Thames Basin and is characterised by a series of flood plain terraces. Rare open spaces, such as reservoirs and wetland areas (e.g. the Lea Valley) within the NCA provide space for leisure activities in an otherwise urban area. The area bares a long and rich cultural history which has carried forward into the present day, and is now a major hub for international business and tourism. Due to the heavy urbanisation, the area is heavily dependent on transport schemes, such as a complex subterranean tunnel system, and ecosystem services such as flood alleviation.

Appendix H Assessment Definitions of Significance

SEA objective	Datasets/Key Themes	Effect	Description	
Biodiversity, Flora, Fauna: Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	SPA SAC Ramsar site SSSIs MPA MCZ NNR LNR Priority habitats and species Non-designated sites Terrestrial, aquatic and marine habitats, species and protected sites Green networks and corridors (e.g. foraging areas and commuting routes, migration routes, hibernation areas etc. at all scales)	**+++**	Major Positive	• The option would result in a major enhancement on the quality of designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat quality and availability. • The option would result in a major increase in the population of a priority species. • Effects could be caused by beneficial changes in water flows/water quality, or large amounts of creation or enhancement of habitat, promoting a major increase in ecosystem structure and function. • The option would result in a major reduction or management of INNS.
		++	Moderate Positive	• The option would result in a moderate enhancement on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. • The option would result in a moderate increase in the population of a priority species. • Effects could be caused by beneficial changes in water flows/water quality, or moderate amounts of creation or enhancement of habitat, promoting a moderate increase in ecosystem structure and function. • The option would result in a moderate reduction or management of INNS.
		+	Minor Positive	• The option would result in a minor enhancement of the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. • The option would result in a minor increase in the population of a priority species. • Effects could be caused by beneficial changes in water flows/water quality, or small amounts of creation or enhancement of habitat, promoting a minor increase in ecosystem structure and function. • The option would result in a minor reduction or management of INNS.
		0	Neutral	• The option would not result in any effects on designated or non-designated sites including habitats and/or species). It will not have an effect on INNS.
		-	Minor Negative	• The option would result in a minor negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. • The option would result in a minor decrease in the population of a priority species. • Effects could be caused by detrimental changes in flows/water quality, or small losses or degradation of habitat leading to a minor loss of ecosystem structure and function. • The option would result in a minor increase or spread of INNS.
		--	Moderate Negative	• The option would result in a moderate negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. • The option would result in a moderate decrease in the population of a priority species. • Effects could be caused by detrimental changes in flows/water quality, or moderate loss or degradation of habitat leading to a moderate loss of ecosystem structure and function. • The options would result in a moderate increase or spread of INNS.
		---	Major Negative	• The option would result in a major negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. • The option would result in a major decrease in the population of a priority species. • Effects could be caused by detrimental changes in flows/water quality, or large losses or degradation of habitat leading to a major loss of ecosystem structure and function. • The option would result in a major increase or spread of INNS.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain

SEA objective	Datasets/Key Themes	Effect	Description	
Soil: Protect and enhance the functionality, quantity and quality of soils	Agricultural Land Classification Landfill sites - authorised and historic	+++	Major Positive	• The option would result in a major enhancement on the quality of soils through the implementation of catchment approaches, remediation or other measures.
		++	Moderate Positive	• The option would result in a moderate enhancement on the quality of soils through the implementation of catchment approaches, remediation or other measures.
		+	Minor Positive	• The option is located on a brownfield site and has no effect on soils or existing land use. • The option results in the remediation of contaminated land.
		0	Neutral	• The option would not result in any effects on soils or land use.
		-	Minor Negative	• The option is not located on a brownfield site and/or results in a minor loss of best and most versatile agricultural land or is in conflict with existing land use. • The option results in land contamination.
		--	Moderate Negative	• The option will result in a moderate loss of best and most versatile agricultural land or is in substantial conflict with existing land use. • The option is partially overlying mineral resources leading to partial mineral sterilisation.
		---	Major Negative	• The option will result in a major loss of best and most versatile agricultural land or is in substantial conflict with existing land use. • The option results in land contamination. • The option is directly overlying mineral resources leading to mineral sterilisation.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain
Water: Increase resilience and reduce flood risk Protect and enhance the quality of the water environment and water resources Deliver reliable and resilient water supplies	Environment Agency Flood Defences Environment Agency Main Rivers Flood Zones 2 and 3 Surface Water Features WFD River Waterbody Catchments WFD River Waterbodies Cycle 2 Bathing Waters (for desal options) Shellfish Waters (desal options) Source Protection Zones WFD Groundwater bodies	+++	Major Positive	• The option results in addressing failure of WFD Good Ecological Status / Good Ecological Potential. • The option would result in a major improvement to flood risk. • The option would result in a major improvements in water efficiency, reduces demand and improves resilience.
		++	Moderate Positive	• The option achieves savings through demand management and does not require abstraction to achieve yield. • The option contributes to addressing failure of WFD Good Ecological Status / Good Ecological Potential. • The option would result in a moderate improvement to flood risk. • The option would result in a moderate improvements in water efficiency, reduces demand and improves resilience.
		+	Minor Positive	• The option achieves savings through demand management and does not require abstraction to achieve yield. • The option would result in a minor improvement to flood risk. • The option would result in a minor improvements in water efficiency, reduces demand and improves resilience.
		0	Neutral	• The option would have no discernible effect on river flows or surface/coastal water quality or on groundwater quality or levels. The option would not have an effect on or be affected by flood risk.
		-	Minor Negative	• The option would result in minor decreases in river flows. River and/or coastal water quality may be affected and lead to short term or intermittent effects on receptors (e.g. designated habitats, protected species or recreational users of rivers and the coastline) that could not be avoided but could be mitigated. • The option would result in minor decreases in groundwater quality or levels. • The option is located in Flood Zone 2. • The option would result in minor decreases in water efficiency, increases demand and reduces resilience.

SEA objective	Datasets/Key Themes	Effect	Description	
		--	Moderate Negative	• The option would result in moderate decreases in river flows. River and/or coastal water quality may be affected and lead to long term or continuous effects on receptors (e.g. designated habitats, protected species or recreational users of rivers and the coastline) that could not reasonably be mitigated. • The option results in the likely deterioration of WFD classification. • The option would result in moderate decreases in groundwater quality or levels. • The option is located in Flood Zone 3. • The option would result in moderate decreases in water efficiency, increases demand and reduces resilience.
		---	Major Negative	• The option would result in major decreases in river flows. River and/or coastal water quality may be affected and lead to long term or continuous effects on receptors (e.g. designated habitats, protected species or recreational users of rivers and the coastline) that could not reasonably be mitigated. • The option results in the deterioration of WFD classification. • The option would result in major decreases in groundwater quality or levels. • The option is located in Flood Zone 2 or 3 and further contributes to flood risk. • The option would result in major decreases in water efficiency, increases demand and reduces resilience.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain.
Air: Reduce and minimise air emissions	Air Quality Management Zones Air quality monitoring sites	+++	Major Positive	• The option would result in a major enhancement of the air quality within one or more AQMAs.
		++	Moderate Positive	• The option would result in a moderate enhancement of the air quality within one or more AQMAs.
		+	Minor Positive	• The option would result in an enhancement of the air quality.
		0	Neutral	• The option would not result in any effects on Air Quality and AQMAs.
		-	Minor Negative	• The option would result in a decrease of the air quality.
		--	Moderate Negative	• The option would result in a decrease of the air quality within one or more AQMAs.
		---	Major Negative	• The option would result in a major decrease in the air quality within one or more AQMAs.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain.
Climate Factors: Reduce embodied and operational carbon emissions Reduce vulnerability to climate change risks and hazards	Option Carbon data UKCP18 climate data Sea level rise projections	+++	Major Positive	• The option will generate significant additional zero carbon energy that can be fed back into the grid/reduce carbon emissions (see carbon scale) • The option will result in a major increase in carbon sequestration. • The option will increase resilience/decrease vulnerability to climate change effects.
		++	Moderate Positive	• The option will increase resilience/decrease vulnerability to climate change effects. • The option will result in a moderate increase in carbon sequestration. • The option will generate moderate additional zero carbon energy that can be fed back into the grid/reduce carbon emissions (see carbon scale)
		+	Minor Positive	• The option will increase resilience/decrease vulnerability to climate change effects. • The option will result in a minor increase in carbon sequestration. • The option will generate minor additional zero carbon energy that can be fed back into the grid/reduce carbon emissions (see carbon scale)

SEA objective	Datasets/Key Themes	Effect	Description	
		0	Neutral	• The option would have no discernible effect on greenhouse gas emissions, nor would the option increase resilience/decrease vulnerability to climate change effects.
		-	Minor Negative	• The option will have a minor impact on resilience/decrease vulnerability to climate change effects. • The option will generate minor construction and/or operational carbon emissions (see carbon scale).
		--	Moderate Negative	• The option will have a moderate impact on resilience/significantly decrease vulnerability to climate change effects. • The option will generate moderate construction and/or operational carbon emissions (see carbon scale). • The option will result in a moderate release of previously sequestered carbon.
		---	Major Negative	• The option will have a major impact on resilience/significantly decrease vulnerability to climate change effects. • The option will generate significant construction and/or operational carbon emissions (see carbon scale). • The option will result in a major release of previously sequestered carbon.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain.
Landscape: Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	Areas of Outstanding Natural Beauty, National Character Areas, Green Belt, National Parks	+++	Major Positive	• The option would have a major positive contribution to designated landscape (National Landscape or National Park) management plan objectives • The option results in new, above ground infrastructure that significantly enhances the local landscape, townscape or seascape.
		++	Moderate Positive	• The option would have a moderate positive contribution to designated landscape management plan objectives • The option results in new, above ground infrastructure that has a moderate positive effect on the local landscape, townscape or seascape.
		+	Minor Positive	• The option results in new, above ground infrastructure that has a minor positive effect on the local landscape, townscape or seascape.
		0	Neutral	• The option would not result in any effects on the local landscape, townscape or seascape.
		-	Minor Negative	• The option results in new, above ground infrastructure that has a minor negative effect on the local landscape, townscape or seascape.
		--	Moderate Negative	• The option would have a moderate negative effect on a designated landscape or feature (i.e. significant visually intrusive infrastructure) whose effects could not be reasonably mitigated. • The option results in new, above ground infrastructure that has a moderate negative effect on the local landscape, townscape or seascape.
		---	Major Negative	• The option would have a negative effect on a designated landscape or feature (i.e. significant visually intrusive infrastructure) whose effects could not be reasonably mitigated. • The option results in new, above ground infrastructure that has a major negative effect on the local landscape, townscape or seascape.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain.

SEA objective	Datasets/Key Themes	Effect	Description	
Historic Environment Conserve, protect and enhance the historic environment, including archaeological remains	Listed buildings: - Grade I listed structures - Grade II* listed structures - Grade II listed structures Registered Parks and Gardens: - Grade I Registered Parks and Gardens - Grade II* Registered Parks and Gardens - Grade II Registered Parks and Gardens Protected Wrecks Registered Battlefields Scheduled Monuments Conservation Areas World Heritage Sites	+++	Major Positive	• The option will result in enhancements to designated heritage assets and/or their setting, fully realising the significance and value of the asset, such as: - Securing repairs or improvements to heritage assets, especially those identified in the Historic England Buildings/Monuments at Risk Register; - Improving interpretation and public access to important heritage assets.
		++	Moderate Positive	• The option will result in enhancements to designated heritage assets and/or their setting. Improving interpretation and public access to important heritage assets.
		+	Minor Positive	• The option will result in enhancements to non-designated heritage assets and/or their setting.
		0	Neutral	• The option will have no effect on cultural heritage assets or archaeological remains.
		-	Minor Negative	• The option will result in the loss of significance of undesignated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected. • There will be limited damage to known, undesignated archaeologically important sites with a consequent loss of significance only partly mitigated by archaeological investigation.
		--	Moderate Negative	• The option will result in the loss of significance of undesignated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected. • The option will diminish of significance of designated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected.
		---	Major Negative	• The option will diminish the significance of designated heritage assets and/or their setting such as: - Demolition or further deterioration in the condition of designated heritage assets especially those identified in the Historic England Buildings/Monuments at Risk Register. - Loss of public access to important heritage assets and lack of appropriate interpretation. - There will be major damage to known, designated archaeologically important sites with a consequent loss of significance only partly mitigated by archaeological investigation.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain.
Population, Human Health Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing Maintain and enhance tourism and recreation	Noise action important area Indices of Multiple Deprivation 2015 Functional site: - Schools - Medical facilities OS Greenspace dataset: - Allotments - Bowling green - Cemetery - Golf course - Sports facility - Play space - Playing field - Public park or garden - Religious grounds - Tennis courts Natural England - Country Parks National Parks Section 15 open access areas	+++	Major Positive	• The option leads to major positive effect on the health of local communities and will ensure that surface water and bathing water quality is maintained within statutory limits. The option creates new, and significantly enhances existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		++	Moderate Positive	• The option leads to positive effect on the health of local communities and will ensure that surface water and bathing water quality is maintained within statutory limits. • The option enhances existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area
		+	Minor Positive	• The option has a temporary positive effect on the health of local communities and will ensure that surface water and bathing water quality is maintained within statutory limits.
		0	Neutral	• The option would not result in any effects on human health and existing recreational facilities and/or tourism.
		-	Minor Negative	• The option has a temporary effect on human health (e.g. noise or air quality). The option reduces the availability and quality of existing recreational facilities and/or tourism within the operational area.
		--	Moderate Negative	• The option results in the permanent removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area.

SEA objective	Datasets/Key Themes	Effect	Description	
	CRoW S4 Conclusive Registered Common Land	---	Major Negative	• The option has a significant long-term effect on human health (e.g. noise or air quality). • The option results in the removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain.
Material Assets Minimise resource use and waste production Avoid negative effects on built assets and infrastructure	Transport: - Major roads - A roads - Major roads motorway - Railway line - National cycle route - National trails	+++	Major Positive	• The option will re-use or recycle substantial quantities of waste materials and any new infrastructure will incorporate substantial sustainable design measures and materials. • There will be no increase in energy consumption or energy will be from 100% renewable sources. • The option improves national cycle routes or national trails.
		++	Moderate Positive	• The option will re-use or recycle moderate quantities of waste materials and any new infrastructure will incorporate some sustainable design measures and materials. There will be no increase in energy consumption or energy will be from 90% renewable sources. • The option improves national cycle routes or national trails.
		+	Minor Positive	• The option will re-use or recycle a limited quantity of waste materials and any new infrastructure will incorporate some limited sustainable design measures and materials. • There will be no increase in energy consumption or energy will be from 80% renewable sources. • The option improves national cycle routes or national trails.
		0	Neutral	• The option would not result in any effects on material assets.
		-	Minor Negative	• The option will require new infrastructure with only limited opportunities for the re-use or recycling of waste materials. There are limited opportunities for sustainable design or the use of sustainable materials. • The option results in a minor increase in energy consumption with no renewable energy options. • The option results in a minor disruption on built assets and infrastructure, including transport.
		--	Moderate Negative	• The option will require new infrastructure with only limited opportunities for the re-use or recycling of waste materials. • The option results in a moderate increase in energy consumption with no renewable energy options. • The option results in a moderate disruption on built assets and infrastructure, including transport links.
		---	Major Negative	• The option will require significant new infrastructure that cannot be provided through the re-use or recycling of waste materials. There are no opportunities for sustainable design or the use of sustainable materials. • The option results in a major increase in energy consumption with no renewable energy options. • The option results in a major distribution on built assets and infrastructure, including transport links.
		?	Uncertain	• From the level of information available the effect that the option would have on this objective is uncertain.

Appendix I Constrained Options Assessments

Please see separate document, available on request.

Appendix J Demand Management and Leakage Options Assessments

Please see separate document.

Appendix K Revised Preferred Options Assessments

Please see separate document.

Appendix L Summary of Post Mitigation Significant Effects by Water Resource Zone Options

Please see separate document.

Appendix M Biodiversity Net Gain and Natural Capital Report

Please see separate document.