FINAL WATER RESOURCES MANAGEMENT PLAN 2024

STRATEGIC ENVIRONMENTAL ASSESSMENT: NON-TECHNICAL SUMMARY

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Strategic Environmental Assessment Non-Technical Summary

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Abbreviations

AONB	Area of Outstanding Beauty
ACWG	All Company Working Group
AQMA	Air Quality Management Areas
BNG	Biodiversity Net Gain
CAMS	Catchment Abstraction Management Strategy
CFMP	Catchment Flood Management Plans
CPRE	Campaign for Rural England
CROW	Countryside and Rights Way
CO_2	Carbon Dioxide
DO	Deployable Output
DCLG	Department for Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
dWRMP	Draft Water Resources Management Plan
DYAA	Dry Year Annual Average
DYCP	Dry year Critical Period
EAAP	Ecosystems Approach Action Plan
EIP	Environmental Improvement Plan
EU	European Union
FRA	Flood Risk Area
fWRMP	Final Water Resources Management Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
HER	Historic Environment Record
HRA	Habitats Regulations Assessment
ICA	In Combination 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

Ml/d	Megalitres per day
MPZ	Marine Protection Zone
NCA	National Character Area
NERC	Natural Environment and Rural Communities
NGO	Non Government organisation
NFM	Natural Flood Management
NNR	National Nature Reserve
NO_2	Nitrogen Dioxide
NPPF	National Planning Policy Framework
NSIP	Nationally Significant Infrastructure Project
NYAA	Normal Year Annual Average
ONS	Office for National Statistics
PM	Particulate Matter
RAG	Red-Amber-Green
RCP	Representative Concentration Pathway
RBMP	River Basin Management Plan
RdWRMP	Revised Draft Water Resources Management Plan
SAC	Special Areas of Conservation
SEA	Strategic Environmental Assessment
SES Water	Sutton and East Surrey Water
SEW	South East Water
SMP	Shoreline Management Plans
SPA	Special Protection Area
SRO	Strategic Resource option
SSSI	Sites of Special Scientific Interest
SRO	Strategic Resource Option
SPA	Special Protection Area
UK	United Kingdom
UKCP18	UK Climate Projections 2018
UKWIR	United Kingdom Water Industry Research
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WAFU	Water Available For Use
WFD	Water Framework Directive
WINEP	Water Industry Improvement Program
WRMP	Water Resource Management Plan
WRPG	Water Resource Planning Guideline
WRZ	Water Resource Zone

1. Introduction

This is the Non-Technical Summary of the Strategic Environmental Assessment (SEA) of Portsmouth Water's Final Water Resource Management Plan 24 (fWRMP24). The purpose of this Non-Technical Summary is to set out the SEA process and the outcomes derived from this and is intended to inform people who have a general interest in the WRMP24, but who are not concerned with its detailed technical assessment. Readers are advised to read the full contents of the SEA Report for more detailed information if required.

While it is the aim that the WRMP24 delivers on its objective of ensuring customers and communities have adequate water supplies available and ensuring that these supplies are resilient to droughts and other future challenges, it is important that this is done in a way which protects the environment and human health. In order to ensure that as great an understanding as possible of the potential effects of the WRMP24 has been made, alongside and informing the SEA, a series of other environmental assessments were undertaken, namely Water Framework Directive (WFD) Assessment, Biodiversity Net Gain (BNG) Assessment, Natural Capital (NC) Assessment, Invasive Non-Native Species (INNS) Assessment, Heritage Impact Assessment (HIA) and Sites of Special Scientific interest (SSSI) Assessment.

It is also important to note that as there is a potential that the WRMP24 could lead to a direct or indirect effect on sites which have been designated at the European level for nature conservation purposes (such as Special Areas of Conservation), a Habitats Regulation Assessment (HRA) was also carried out.

On 15th November 2022 Portsmouth Water published their draft Water Resource Management Plan 2024 (dWRMP24) and associated SEA Environmental Report for consultation. The public consultation ran for a 12-week period and closed on 20th February 2023. Portsmouth Water's Statement of Response (SoR), revised draft WRMP24 (rdWRMP24) and revised SEA Environmental Report was issued to Defra on 31st August 2023, which took on board the comments received from the draft plan consultation exercise, in addition to updated outputs and data from the Water Resources South East (WRSE) regional modelling in relation to:

- Population and growth forecasts to reflect updated data not available previously;
- Demand forecasts to reflect the above, and updating the base year for forecasts;
- Data and information on individual options, including option timing, costs and best value metrics, and option availability;
- Demand management options, including commitments to leakage and PCC targets considering Government policy expectations, including in the Government's Environmental Improvement Plan; and
- Other data updates to reflect new data availability.

This fWRMP24 SEA Environmental Report further takes on board comments received from Defra[1] which required further information to inform the Secretary of States decision on next steps for Portsmouth Water's plan. Additional information to support the SoR was issued to Defra on 15th April 2024 for review, prior to their formal approval to publish which was received on 21st August 2024.

1.1. The background and need for the WRMP24

It is a regulatory requirement under the Water Industry Act 1991 for water companies to produce a WRMP every five years to help ensure customers and communities have adequate water supplies available. Water Companies in England are currently developing their WRMP for the next 50-year period from 2025 to 2075, known as WRMP24. A significant influence on each water company plan has been the Environment Agency's National Framework for Water Resources (launched in March 2020). The Framework sets out a national aspiration to leave the environment in a better condition than we found it, while improving resilience to drought and minimising interruptions to water supplies.

The Portsmouth Water WRMP24 outlines how the water company has considered the implications of climate change, sustainable abstractions, future population, and housing growth, in addition to other factors that affect long term future uncertainty. The Plan sets out the overall approach and recommended options to reduce any predicted deficits and how to maintain secure supplies to its customers, for the period 2025 to 2075. As it is recognised that the Plan could have implications for the environment beyond the Plan area, it is also couched

[1] The Environment Agency and Natural England are statutory consultee for WRMPs. At the statement of response stage, their role changes and they become technical advisors to Defra and the Secretary of State

within a wider regional planning context, which examines water resource planning and associated environmental effects across the south-east of England.

1.1.1. Regional Planning

The Portsmouth Water WRMP24 is being produced alongside the Water Resources South East (WRSE) regional Plan which recognises that the south-east of England faces the greatest pressures on public water supplies. It has been estimated that over 1 billion additional litres of water will be required per day by 2050 and nearly 1.7 billion litres per day by 2100[2].

Via a collaborative approach, Portsmouth Water are working with five other companies under the banner of WRSE to help safeguard continued supplies of water to this part of the country. Alongside Portsmouth Water, the other companies within WRSE are:

- Affinity Water
- SES Water (Sutton & East Surrey)
- Southern Water
- South-East Water
- Thames Water

The WRSE regional plan aims to take a long-term view to water resource planning across the region to 2075 in order to secure a sustainable and resilient water supply. As part of this, the regional plan intends to address issues of a growing population, improve the environment, increase resilience to severe drought and address impacts of climate change. Portsmouth Water have developed a plan which is aligned with that for the wider region, but which also focusses and addresses local issues of particular relevance to Portsmouth.

1.1.2. Portsmouth Water's WRMP

There are a number of challenges in developing a WRMP for the Portsmouth area, with implications for both future water supplies and customer demand. While development of the WRMP24 utilised the work undertaken by WRSE as much as possible, further consideration was given to key issues during development of the WRMP24 that included:

- The Portsmouth Water supply area is an area of serious water stress.
- A need to reduce reliance on chalk aquifers.
- An opportunity to contribute to a protected and enhanced environment.
- Uncertainty around population increase and the 'new normal' for water use (relating to the outworkings of COVID-19 and the 'Brexit' process).
- A changing climate.
- Planning for normal conditions as well as dry years, critical peaks and droughts.
- Increase resilience.
- Adaptive planning provides an opportunity to develop a plan able to accommodate uncertainty.

There is considerable uncertainty surrounding many of the above key issues. However, across the South East region, an 'adaptive planning' approach has been taken to develop a Plan that can change as the understanding of these key issues becomes clearer in future. This means that while the Plan identifies immediate investment needs, it can then adapt as the future 'unfolds'. This ensures Portsmouth Water will make the right immediate investment decisions so they can provide resilient water supplies to their customers in the years ahead.

This approach has been rigorous and robust. For example, as part of the development of WRMP24, Portsmouth Water identified 840 different potential futures based upon six different population growth scenarios, 28 climate change scenarios and five different environmental scenarios. This approach resulted in the following key components of WRMP24:

- **Starting in 2025–26:** Implementation of the 'High Plus' basket of demand management measures which aims to reduce leakage by 50 per cent by 2040 and overall customer demand for water by around 26 per cent by 2050 compared to 2021–22 levels. This basket of measures includes universal household and non-household 'smart' metering over 10 years starting in 2025–26. Existing 'dumb'

[2] WRSE Draft Regional Plan SEA Environmental Report, September 2022

meters will also be either upgraded or replaced with smart meters, ensuring that to the extent that it's practically achievable, by 2035 every household and non-household meter will be smart. By 2034–35 we expect that 94.7 per cent of the households we serve will have a meter, compared with 34 per cent in 2021–22. Installing 'smart' meters will deliver additional benefits to reducing water demand, as the data from the meters will help reduce leakage inside and outside properties and improve the quality of our customer engagement. These demand reductions are profiled to aim to meet the EIP targets for demand reductions for leakage, households and non-households.

To optimise the effectiveness of our own water efficiency efforts, our best value plan assumes that the Government will introduce mandatory water labelling for white goods and strengthen water regulations standards to improve water efficiency in homes. This assumption has been applied consistently across the WRSE regional planning area and discussed with regulators. Other key assumptions and outcomes include:

- **From 2025-26 and 2038-39:** Our levels of service for Emergency Drought Orders (i.e. rota cuts) will remain at 1-in-200 during this period, increasing to 1-in-500 from 2039 onwards. This increases the deployable output available to us during this period.
- **From 2025–26 until 2040–41:** When required in extreme events, the continued use of existing drought schemes in accordance with our drought plan (Temporary Use Bans, Non-Essential Use Bans and our supply-side Source S drought permit). Beyond 2040-41 the Source S drought permit is no longer used, although the implementation of Temporary Use Bans and Non-Essential Use Bans is continued.
- **From 2025–26:** Continued provision of existing and planned bulk supplies to Southern Water, including from Havant Thicket Reservoir. This involves providing up to a 15 Ml/d transfer to Southern Water at our eastern border and providing up to a 15 Ml/d transfer to Southern Water at our western boundary from 2029, rising to a 51 Ml/d capacity transfer by 2031-32 (once Havant Thicket Reservoir becomes online). The actual transfer rates vary throughout the planning horizon depending on the amount of water we have available for transfer and the needs of Southern Water. Since the dWRMP24 we have agreed with Southern Water to minimise exports in a normal (non drought year) in order to minimise abstraction from our chalk aquifers to reduce the risk of Water Framework Directive related deterioration in water body status.
- **By 2034:** A network enhancement to improve the way we can move water resources around our supply area (unlocking conjunctive use benefits associated with Havant Thicket Reservoir, once operational). This option was also selected in the dWRMP24.
- **By 2040:** A bulk import of potable water from Southern Water to the west of our supply area. This represents a reversal of flow in the existing and planned bulk supplies to Southern Water. Once Southern Water has more water in Hampshire through the delivery of a supply development detailed within the WRSE revised draft regional plan and Southern Water's WRMP24, we would be able to start receiving supplies from Southern Water to support our own supplies in future. This option was also selected in the dWRMP24 but is now selected around 8 years earlier.

  The South East Strategic Reservoir Option (Sesro) provides water to Thames, Southern and Affinity in the WRSE regional best value plan during different conditions. We also get an indirect benefit from Sesro in the preferred plan, as we become a net importer of water from Southern, who in turn get their water from a combination of Sesro (via the Thames to Southern transfer) and the Hampshire Water Transfer and Water Recycling Project (HWTWRP).
- **From 2047 onwards:** Further into the planning period there is a need for further interconnectivity and treatment capacity to transfer and treat water across our supply area to utilise the water most effectively from Havant Thicket Reservoir. In the dWRMP24 these options were not selected in the preferred pathway but now feature in the preferred plan due to the need to find additional water resulting from higher sustainability reductions.

  The plan suggests the scale of this need would require up to 20 Ml/d of additional treatment works capacity at Works A WTW from the mid to late 2040s and a new 10 Ml/d WTW at the location of service Reservoir C from the early 2050s. These options are predicated on the prior construction of the proposed HWTWRP scheme for Southern Water.

  To support this extra demand the plan suggests the reservoir could need additional recycled water to be added, meaning the water taken would be blended reservoir water (i.e. with contributions from rainfall, recycled water and spring water). Portsmouth Water will seek to remove this dependency in the next water resources management plan (WRMP29) via the consideration of new options (for reasons set out in the next paragraphs), although the need for recycled water in a drought is expected to remain.

Note that not all Options contained within the WRMP24 have been subject to SEA for a range of reasons including they are baseline options such as existing bulk supplies and previously approved bulk supplies, or are options associated with the Havant Thicket Reservoir that has already received Planning permission.

The area supplied by Portsmouth Water is shown on Figure 1-1 and extends through Hampshire and West Sussex from the River Meon in the West to the River Arun in the East, encompassing 868km^2. The distribution system includes significant strategic treated water storage spread across a series of large, treated water storage reservoirs and is based around a spine main that runs East to West across the Plan area. This system ensures that all customers in the Portsmouth Water area experience the same level of service and the same overall risk of supply failure.

The Portsmouth WRMP24 presents the supply-demand balance throughout the next 50-year planning period (2025-26 to 2074-75).

For full technical detail of how the WRMP24 was arrived at, please see both the WRSE regional plan and the Portsmouth Water fWRMP24.

Figure 1-1 - Portsmouth Water supply area

Portsmouth Water are a “water only” company. That means they only supply drinking water to their customers. Southern Water provide the wastewater service to their customers.

Key facts about the Portsmouth Water Supply area:

- 100 per cent of their water comes from chalk-based sources – Approximately 60 per cent of the water comes from boreholes and wells, 30 per cent from groundwater springs and 10 per cent from the River Itchen.
- Their abstractions influence flows in the Itchen, Meon, Ems and Lavant chalk streams and rivers.
- Their customers each use an average of around 153 litres per day. This is 5 per cent higher than the national average of 145 litres.
- The area they serve has significant differences in population density, with a contrast from central Portsmouth to the villages of the South Downs.
- Portsmouth Water generate 10 per cent of their energy from solar panels and are trialling electric and zero emissions vehicles.
- Their average bill is £117 a year. This is the lowest in the industry and significantly below the UK average of £215. Portsmouth Water have been identified as one of the most efficient water companies in the UK.
- The Portsmouth Water area contains areas of the South Downs National Park, protected marine harbours and numerous Sites of Special Scientific Interest. The chalk geology across their supply area

supports them in providing excellent quality drinking water as well as the important and beautiful habitat we enjoy.

2. Approach to assessment

In the development of a Water Resource Management Plan, it is critical that a full understanding is made of how much water can be abstracted from the environment in a sustainable way now and in the future. This understanding has been achieved by Portsmouth Water by undertaking a series of robust environmental assessments that align with the approach taken across the region. The environmental assessment process includes six different assessments:

- Strategic Environmental Assessment (SEA);
- Habitats Regulations Assessment (HRA);
- Water Framework Directive (WFD) Assessment;
- Biodiversity Net Gain (BNG) Assessment;
- Natural Capital (NC) Assessment; and
- Invasive Non-Native Species (INNS) Assessment.

As such, Portsmouth Water have conducted an environmental assessment process grounded on using the SEA process as the umbrella process under which the parallel environmental assessments listed above took place as advised in relevant national environmental assessment guidance. In addition, further assessment took place in relation to the potential for effects on Sites of Special Scientific Interest (SSSI), as well as potential effects on cultural heritage assets and their setting.

The issues considered in the SEA are those set out under the SEA Regulations, namely of biodiversity, soils, the water environment, air and climate, cultural heritage, and landscape, as well as people-based topics of health and material assets. A bespoke assessment framework, compatible with that developed for WRSE as part of the regional SEA but specific to the Portsmouth area, was developed through a review of relevant plans and policies, as well as local baseline information. This ensured that relevant local issues would be addressed as part of the assessment process and would allow for mitigation to be developed to help reduce any adverse effects identified, or to allow for opportunities for environmental improvement to form part of the WRMP development. The robustness of this local assessment framework was verified through consultation on the SEA Scoping Report with key stakeholders and regulators and the comments received formed an important component of refining the assessment process. Further refinement took place following consultation on the dWRMP24, specifically in relation to cultural heritage assets and consideration of non-designated heritage assets.

As noted, alongside the SEA process and helping to inform it, a series of other environmental assessments have been undertaken and are set out as follows.

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 require all natural water bodies to achieve both Good Chemical Status (GCS) and Good Ecological Status (GES) which, collectively, result in a water body classification of good status. Similarly, River Basin Management Plans (RBMP) outline the actions required to enable natural water bodies to achieve good status. New activities and schemes that affect the water environment and which may be derived from the WRMP may adversely impact biological, hydromorphological, physico-chemical and/or chemical quality elements (WFD quality elements), leading to a deterioration in the baseline water body status. As such, careful consideration of Options within the WRMP has been made to determine effects on waterbodies.

Biodiversity Net Gain (BNG) is an approach that aims to leave the natural environment in a measurably better state than beforehand. Natural England have produced a Biodiversity Metric that provides a way of measuring and accounting for biodiversity losses and gains resulting from development or land management change.

Natural capital is defined in the 25 Year Environment Plan (England) as “the elements of nature that either directly or indirectly provide value to people”. As a new and emerging approach, natural capital incorporates methodologies and approaches (such as ecosystem services) to understand the value that natural assets provide. For the water industry, these can be substantial. The Water Resource Planning Guidelines (WRPG) (England and Wales) states that Water Resource Management Plans (WRMPs) should “use natural capital in decision-making”, “use a proportionate natural capital approach”, “deliver environmental net gain”, and provide

cost information on monetised ecosystem service costs and benefits where monetisation is used. WRSE have conducted these BNG and Natural Capital assessments in full, but the findings have been used to inform the Portsmouth WRMP24.

An Invasive Non-Native Species (INNS) assessment has also been carried out to determine the threat of spreading INNS throughout the water supply network and specific resource options and assess ways of mitigating this spread. The results of these INNS investigations haves formed part of the SEA process for the biodiversity and water objectives. INNS dispersal can occur through a range of recreational and operational (water company) 'pathways', which may include water or land-based recreation and sports, and water company operations, such as ground maintenance and the operation of raw water transfers (RWTs).

Within the Portsmouth Water area there are a series of areas that are of vital importance to nature conservation such as those ephemeral and perennial chalk streams and rivers. In addition to their global rarity, chalk streams are diverse ecosystems which support a wide range of native wildlife. Their special status (along with other areas of high ecological value) has been recognised in special nature conservation designations being applied to those areas.

As such, in addition to SEA and the specific environmental assessments outlined above, another specialist assessment has been made of the WRMP24. Habitats Regulations Assessment (HRA) is required by Regulation 105 of the Conservation (Natural Habitats, and species) Regulations 2017 (as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019), where a land use plan is likely to have a significant effect on such sites designated for nature conservation and is not directly connected with or necessary to the management of that site.

Such sites include Special Areas of Conservation (SAC) and Special Protection Areas (SPA). HRA is also required, as a matter of UK Government policy, for potential SPAs (pSPA), possible SACs (pSAC) and listed and proposed wetlands of international importance (Ramsar sites and proposed Ramsar sites) and sites identified, or required, as compensatory measures for adverse effects on habitats sites, pSPA, pSAC and listed or proposed Ramsar sites, for the purposes of considering plans and projects which may affect them. In short, an HRA determines whether there will be any 'likely significant effects' on any of these designated sites because of the implementation of the WRMP (either on its own or 'in combination' with other plans or projects) and, if so, whether these effects will result in any adverse effects on the site's integrity.

Following consultation with Historic England on the dWRMP24, additional assessment was undertaken of heritage assets. A particular focus was made on those Options which are likely to be developed early in the Plan period (2025 – 2035) and along with general construction effects, consideration was made of issues such as an acceleration in the deterioration of in situ waterlogged remains through changes to soil moisture content; pH; reduction-oxidation status; waterlogging, caused by alterations in surface or sub-surface flow. An impact on the significance of aspects of the built environment, where significance is integrally linked with the water environment, i.e. Water Mills and Pump Houses was also made.

Portsmouth Water, in its capacity as a 'Statutory Undertaker' must take reasonable steps to conserve and enhance the special features of SSSIs. Through the WRMP24, a range of options for potable water supply have the potential to impact on the condition of SSSIs in, or adjacent to, the Plan area. Impacts on the condition of SSSIs could be through impact of activities related to the construction of the required water supply infrastructure, or through its operation. It was therefore considered pragmatic and proportionate to undertake and collate a separate assessment of potential effects on SSSIs that can be used to inform the SEA. The approach utilised a SSSI Impact Risk Zone tool developed by Natural England, as well as other technical considerations to identify those sites which could be affected, as well as the particular features of such sites which could potentially be most affected by issues relating to construction and operation of water supply infrastructure. Where potential effects were identified, mitigation was recommended, along with a requirement for further assessment and discussion with Natural England. As with cultural heritage, a focus was placed on those options likely to be developed prior to 2035.

3. The SEA Framework

Following good practice, a number of bespoke SEA objectives have been developed for the WRMP24 and are set out in a SEA Framework. These SEA objectives reflect the environmental sustainability objectives the WRMP24 should be aiming to achieve and the areas that the WRMP24 is expected to impact upon or have an influence on. The expectation is that even though some objectives may not be within the WRMP's direct remit, the WRMP24 should be able to influence the direction of change through setting out clear approaches which could inform the work of Portsmouth Water's partners and other stakeholders.

The SEA Framework consists of 13 objectives and associated decision-making / assessment aid questions and has been developed through the analysis of baseline information and identification of key environmental sustainability issues and opportunities, as well as the review of relevant plans, policies and legislation.

In order to assess how each aspect of the WRMP24 performs against each of the SEA objectives, a series of decision-making criteria / assessment aid questions have also been developed. The decision-making criteria are a way of guiding the assessment.

Table 3-1 - SEA Objectives and decision aid questions for WRMP24

SEA Topic	SEA objective	Decision aid questions
Biodiversity	To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain	Will WRMP24: • Protect and enhance the conservation status of designated sites and their qualifying features (SPAs, SACs, Ramsar sites, MCZs, SSSIs, National Nature Reserves and Ancient Woodland)? • Ensure HRA compliance with regards to international sites? (taken from HRA results) • Affect direct or indirectly a priority habitat on the priority habitat inventory? • Protect and enhance priority habitats and species, including surface and ground water-dependent habitats and species? • Affect the marine environment, habitats and species (including MCZs and MPAs)? • Contribute to the loss or gain in habitat connectivity at local, regional and national scale? • Create or restore habitat delivering a 10% net gain for biodiversity? (taken from BNG assessment results) • Avoid the possibility for INNS to be spread/ introduced? • Create an opportunity to improve biodiversity value through removal of INNS? (taken from the INNS assessment results)
Soil	To protect and enhance the functionality, quantity and quality of soils	Will WRMP24: • Affect high grade agricultural land? • Promote the efficient use of land? • Prevent soil erosion and retain soil stocks as a natural resource? • Involve use of brownfield or greenfield land? • Prevent mineral sterilisation? • Result in soil contamination or involve soil remediation? • Affect SSSIs of geological importance?

SEA Topic	SEA objective	Decision aid questions
Water	To protect and enhance the quantity and quality of surface, groundwater, estuarine and coastal waterbodies and water dependent habitats	Will WRMP24: • Affect surface water quality or quantity? • Affect groundwater quality or quantity? • Affect estuarine or coastal water quality or quantity? • Affect bathing waters? • Affect shellfish water protected areas? • Affect chalk rivers? • Reduce the flashy nature of surface waters? • Slow the flow in upper catchments and reduce soil losses to river systems? • Support achievement of environmental objectives set out in River Basin Management Plans and Shoreline Management Plans • Protect and enhance the environmental resilience of the water environment to climate change? • Contribute to the achievement of WFD objectives (taken from the WFD assessment results)?
Air	To reduce and minimise air and noise emissions	Will WRMP24: • Minimise air emissions (pollutants and noise) that affect human health and biodiversity? • Affect an existing air quality management area (AQMA) or lead to the creation of a new one? • Promote enhancements to green infrastructure networks to help improve air quality?
Greenhouse Gas Emissions	To achieve Portsmouth Water target of reducing carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	Will WRMP24: • Reduce direct and indirect emissions of all greenhouse gases, including carbon dioxide, during construction, operation and decommissioning of schemes? • Maximise supply of energy from low carbon/renewable energy sources / use of low carbon/renewable energy? • Maximise opportunities for making use of waste heat? • Use negative carbon emissions technologies to offset residual emissions such Nature Based Solutions?

SEA Topic	SEA objective	Decision aid questions
		• Create new carbon sinks/removals through natural sequestration including that provided by green infrastructure and soils which contribute to carbon sequestration?
Climate Factors	To reduce vulnerability of built infrastructure to climate change risks and hazards	Will WRMP24: • Avoid development in areas likely to be affected by flooding or where this is not possible ensure that flooding can be managed throughout the lifetime of the infrastructure? • Avoid development in areas likely to be affected by coastal erosion or where this is not possible ensure that coastal change can be managed throughout the lifetime of the infrastructure? • Avoid development which would cause or exacerbate climate related issues such as freshwater and coastal squeeze? • Manage the risks associated to periods of limited water availability during droughts over the lifetime of the infrastructure? • Manage the risks associated with heatwaves and wildfires over the lifetime of the infrastructure? • Manage the risks of flooding and coastal erosion, particularly through working with nature-based solutions?
	To reduce or manage flood risk, taking climate change into account	Will WRMP24: • Avoid development in flood risk areas (whether existing or future) when possible? • Lead to infrastructure development that is flood resilient over its lifetime, considering the effects of climate change, without increasing the flood risk elsewhere and identifying opportunities to reduce the risk overall?
Landscape	To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	Will WRMP24: • Protect and enhance designated landscapes and features? • Affect the character of the landscape, townscape or seascape, including tranquility and views? • Protect conservation areas or historic landscape/townscape areas? • Minimise noise and light pollution from construction and operational activities on residential amenity and on sensitive locations, receptors and views? • Improve access to the countryside? • Create or improve green infrastructure which contributes to access to the landscape?

SEA Topic	SEA objective	Decision aid questions
Cultural Heritage	To conserve, protect and enhance the historic environment and heritage assets, including archaeological remains	Will WRMP24: • Protect designated heritage assets and their settings, sites and features? • Protect heritage assets at risk? • Protect non-designated heritage assets, including important archaeological remains (including unknown archaeological remains)? • Alter the hydrological conditions of water-dependent heritage assets, including organic remains?
Population and Human Health	To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	Will WRMP24: • Allow for green economic development? • Provide employment opportunities and economic diversity? • Minimise disturbance from noise, light, visual, and transport due to construction and operational activities? • Minimise disturbance to active travel (pedestrian and cycle routes, Public Rights of Way) during construction and operational activities? • Secure resilient water supplies for the health and wellbeing of customers?
	To maintain and enhance tourism and recreation	Will WRMP24: • Affect terrestrial, freshwater or marine water resources that are used for tourism and recreation? • Maintain or enhance tourism in the region through the creation or improvement of terrestrial or water-based attractions? • Improve access to the natural environment for recreation, including those living within deprived areas? • Provide education or information resources for the public about the natural environment?
Material Assets	To minimise resource use and waste production	Will WRMP24: • Minimise the use of materials, energy and resources? • Promote water efficiency and encourage a reduction in water consumption? • Minimise the production of waste? • Promote sustainable waste management practices in line with the waste hierarchy? • Encourage the use of recycled and / or secondary materials? • Promote the use of low carbon materials and technologies?

SEA Topic	SEA objective	Decision aid questions
		• Promote the use of local suppliers that use sustainably-sourced and locally produced materials?
	To avoid negative effects on built assets / infrastructure	Will WRMP24: • Reuse existing infrastructure? • Affect major built assets and infrastructure, including transport infrastructure?

4. Technical Environmental Assessment

The SEA Objectives have been formulated to incorporate the findings of the various technical environmental assessments, specifically the Habitats Regulations Assessment, Water Framework Directive Assessment, Biodiversity Net Gain, Invasive Non Native Species and Natural Capital assessments. This has helped to provide an integrated environmental assessment of the plan.

It is however important to note, that whilst the results of the various technical environmental assessments have been used to inform the SEA, care has been taken to align the approaches to ensure there is no risk of double counting where overlaps between some of the SEA objectives and various metrics used in the technical assessments may have occurred (introducing undue bias).

Habitat Regulation Assessment

Habitat Regulation Assessment (HRA) is required by Regulation 63 of the Conservation (Natural Habitats, and Species) Regulations 2017 (as amended). The HRA of the fWRMP24 comprises Stage 1 Screening and Stage 2 Appropriate Assessment (AA). It was undertaken following a methodology based on the extent and nature of the fWRMP24 as a 'plan' and taking a precautionary approach.

The assessment provides a summary of the WRSE screening results for the all the supply options selected in the fWRMP24, undertakes a Stage 1 Screening review where AA was concluded and, dependent on the findings, takes forward to Stage 2 Appropriate Assessment those European Sites which could not be screened out, either alone or in-combination.

Four options were reviewed and one, 'Upgrade Source O Booster to 25 Ml/d', remained screened in for Appropriate Assessment. 'Drought Permit: Source S' was reassessed and found to have 'No Effect' on the European Sites screened and both Works A treatment capacity increase to treat water from Havant Thicket Reservoir (Phase 1) and Works A treatment capacity increase to treat water from Havant Thicket Reservoir (Phase 2) were reassessed and found to have no Likely Significant Effects (LSE) 'alone'.

The in-combination effects assessment at Stage 1 identified potential in-combination effects with other plans and projects affecting water quality and the 'Upgrade Source O Booster to 25 Ml/d option'. This did not affect the screening assessment as the relevant European Sites were already being taken to Appropriate Assessment for the option. No within-plan in-combination effects were identified. However, potential inter-company in-combination effects were identified for 'Upgrade Source O Booster to 25 Ml/d' and 'Works A treatment capacity increase to treat water from Havant Thicket Reservoir (Phase 2)' options with 17 Southern Water options for 12 European Sites. The outcome did not affect the assessment for 'Upgrade Source O Booster to 25 Ml/d', as this was already taken through to Appropriate Assessment; however, 'Works A treatment capacity increase to treat water from Havant Thicket Reservoir (Phase 2)' was screened back in for AA as a result of potential in-combination effects.

In the absence of detailed project-specific information, a high-level assessment of the potential for options within fWRMP24 to have an adverse effect on the integrity of European Sites was undertaken at Stage 2 Appropriate Assessment. As the 'Drought Permit: Source S' option had been screened out, the Appropriate Assessment only included the 'Upgrade Source O Booster to 25 Ml/d' and 'Works A treatment capacity increase to treat water from Havant Thicket Reservoir (Phase 2)' options. A total of ten European Sites were included in the Appropriate Assessment following the inclusion of potential effects from groundwater sources in the assessment.

It is considered reasonable to anticipate from the information available that the 'Upgrade Source O Booster to 25 Ml/d option' could be delivered in a manner which avoids any adverse effects on the integrity of the European Sites. This is through a combination of modelling and investigation to inform design, sensitively designing, programming and constructing options, and using standard mitigation techniques. The potential pathway relating to water quality is generally one that can be resolved through standard mitigation measures, unless linked to aquifer recharge and release of nutrients, in which case alternative measures considering the management of abstractions would be required. Impacts relating to water quantity may also need to be managed in this way. However, this must be confirmed based on project design. HRA will therefore be required at project stage for Upgrade to Source O Booster to 25 Ml/d to fully assess all potential impacts upon European sites once the option design has been finalised and the construction programme is known.

Three European Sites were included in the Appropriate Assessment for 'Works A treatment capacity increase to treat water from Havant Thicket Reservoir (Phase 2)': Solent and Dorset Coast SPA, Portsmouth Harbour SPA/Ramsar site. As the option was screened in due to potential in-combination effects with other discharges

to The Solent from Southern Water options, an adverse effect cannot be ruled out without further assessment.

Taking into account the findings of the assessment, it can reasonably be concluded that the inclusion of most options in fWRMP24 will not have an adverse effect on the integrity of the European sites alone or in-combination. However, further assessment at a project-level will be required to allow any conclusion to be drawn with certainty for 'Works A treatment capacity increase to treat water from Havant Thicket Reservoir (Phase 2)'.

Water Framework Directive

The WFD report available as Appendix H presents the findings of the Water Framework Directive (WFD) assessment that has been undertaken as part of the environmental assessment process to support the development of the WRSE Regional Plan.

The WFD assessments have been undertaken by WRSE and results considered in the undertaking of the SEA of Portsmouth Water's fWRMP24. The Level 1 WFD assessments have been reviewed and updated for the WRMP24 Schemes. The Level 2 assessment has been undertaken only on those supply options selected before 2050 by the WRSE Best Value Plan (BVP), Best Environmental and Societal Plan (BESP) or the Least Cost Plan (LCP) and is based on the All Companies Working Group methodology for each of the Schemes.

The pre-2050 Portsmouth Water option selected in the WRSE BVP, BESP and LCP is listed as follows:

- Drought Permit: Source S
- Upgrade Source O Booster to 25 Mld
- Works A treatment Capacity increase to treat water from Havant Thicket Reservoir (Phase 1)
- Pipeline associated with Works A treatment capacity increase to distribute water from Havant Thicket Reservoir
- Works A treatment Capacity increase to treat water from Havant Thicket Reservoir (Phase 2)

All options with the exception of Drought Permit: Source S were Screened as WFD compliant in the Level 1 assessment and did not require a Level 2 assessment.

In summary, the L2 assessment for this drought permit option concludes that there is Medium risk for the temporary increased abstraction from the Chichester Chalk to be WFD non-compliant and, therefore, further assessment is required to ensure that the additional abstraction does not negatively impact under the quantitative GWDTE, dependent surface water body and water balance tests.

Biodiversity Net Gain

Biodiversity Net Gain (BNG) is a specific, measurable outcome of project activities that deliver demonstrable and quantifiable benefits to biodiversity compared to the baseline situation. Biodiversity metrics provide a way of measuring and accounting for biodiversity losses and gains resulting from development and/or land management change.

A BNG assessment forms an integral part of the Strategic Environmental Assessment and the inclusion of BNG as part of the fWRMP24 environmental assessment process is supported by the updated Water Resources Planning Guideline Supplementary Guidance 'Environmental Society in Decision Making' (November 2021).

BNG assessments for the nine Portsmouth Water supply options were screened out as they will not result in a change in land use.

Natural Capital

Natural capital assessments (NCA) are required in order to evaluate the impact of the proposed Portsmouth Water options on the natural environment through an assessment of the impact of the Option on the natural capital stocks and subsequent ecosystem services these stocks provide.

This was undertaken by Water Resources South East's (WRSE) in accordance with the WPRG Supplementary Guidance. A condition under this is that only supply-side options are within scope of a NCA, of which there are nine options for Portsmouth Water.

All supply side options considered were either scoped out of a natural capital assessment by WRSE, included in the baseline scenario for Portsmouth Water, or allocated as options to other water companies (due to being a transfer between two water companies). This means that there are no numerical outputs of the NCAs of

Portsmouth Water options due to no expected future impacts, or the costs and benefits were allocated to other water companies.

This analysis contributes to the wider fWRMP objectives of Portsmouth Water through highlighting that the proposed options are not expected to materiality harm the natural capital stocks of the region.

Invasive Non-Native Species

This INNS risk assessment (the risk of INNS being introduced and spread through the functioning of each scheme via transfer pathways that may become active once the scheme is operational) has been undertaken through a Level 1 screening assessment only. The Level 1 screening assessment is used to determine whether any schemes are considered high-enough risk to warrant a Level 2 risk assessment using the Environment Agency's SAI-RAT. The tool can be used to quantify (as a percentage) the INNS risk associated with options, based on the conceptual design information currently available.

Water Resources South East's (WRSE) high-level screening methodology was used to complete the L1 assessment which accounts for frequency in which transfers would be operational and the severity of their impact, as inferred by the nature and volume of water being transferred. These criteria formed a screening matrix for assessment, in which only schemes scoring 'low', 'medium' or 'high' are taken forward for a Level 2 assessment.

The INNS Report concluded that the operation of all supply options in Portsmouth Water's fWRMP24 can be deemed of 'very low risk' of spreading INNS. As none of the supply options achieved a screening risk of greater than 'very low', no L2 risk assessments have been completed.

During construction it has been assumed that standard mitigation can be put in place to prevent the spread of INNS, including the requirement to have an Invasive Species Management Plan in place which will set out the general ways in which a contractor will work in a biosecure way, abiding by biosecurity best practice. An Invasive Species Management Plan may include the following requirements; to adopt the Check – Clean –Dry approach, provide all construction staff with identification guides for the species known to be in the area, and provide a toolbox talk to educate staff members in identifying high-risk INNS.

Engagement with the Environment Agency will take place, where required, to identify measures that are most appropriate. Portsmouth Water are committed to ensuring INNS are kept under review going forward both during the Design and Construction phases, to ensure that INNS spread is kept to a minimum.

Heritage Impact Assessment

This HIA provides high-level heritage impact assessments for all options that feature in either Portsmouth Waters Best Value Plan (BVP), or one of their alternative plans (Best Environmental & Societal Plan, Least Cost Plan or Low Demand Strategy), up to 2035. This includes the Upgrade Source O Booster to 25Ml/d and Drought Permit: Source S options.

Demand side options include measures such as demand reduction, addressing leakage, water efficiency and catchment management. These options do not have any potential for impact on heritage assets and are therefore not considered in this HIA. The effective use of demand reduction measures minimises the need for new infrastructure and reduces the potential for impacts on heritage assets as a result of development.

Two supply side options were assessed, these were Upgrade Source O Booster to 25Ml/d and Drought Permit: Source S.

In relation to Upgrade Source O Booster to 25Ml/d the main risks from construction work within the study area are to unknown buried remains associated with a Roman Villa complex, which may include human remains and waterlogged organic remains. Construction works that uncover unexpected remains will incur extra costs and time delays, which can be prevented through planning and mitigation. It is presumed that these risks will be avoided, as the designs for the scheme relate only to replacement of and instalment of pumps within the pump house, within existing excavations. The likely significance of effect has been identified as **Neutral**.

The HIA found that for Drought Permit: Source S further detailed, assessment of receptors and impacts is recommended to be undertaken commensurate with option selection and potentially using additional outputs from groundwater modelling. This may include a more detailed desktop assessment covering the receptors identified by future modelling, and may also include on site assessments following guidance provided by Historic England on the preservation of archaeological remains[3]. In order to assess and manage long term

[3] *ibid*

impacts, it will first be necessary to better understand the archaeological character and preservation of remains within vulnerable areas.

Assessment of potential effects on Sites of Special Scientific Interest

This SSSI Assessment sets out the fWRMP24 Options and identifies those SSSI where an Option, being progressed early in the plan period (pre-2035), (and its related construction / operation) could potentially pose a risk to that SSSI.

Note that those schemes considered baseline and those that have secured planning approval have been excluded from assessment. Also excluded are demand options including consumption reduction measures and non-essential use bans owing to their broader application across the Plan area, an absence of construction phase impacts, temporal duration (either construction or operation) or a combination of these factors. Assessments were therefore carried out for Upgrade Source O Booster to 25 Ml/d and Drought Permit: Source S.

Due to the works being limited to within an existing pumping station it was considered that none of the Operations Requiring Natural England's Consent (ORNECs) associated with the SSSIs would be relevant to Upgrade Source O Booster to 25 Mld option. Consequently, no adverse effects on the respective SSSIs were identified.

While it is to be noted that re-assessment will be required at the project stage (when further design information is available in respect of each of the supply options) the SSSI assessment finds that of the early options, Drought Permit: Source S has the potential to give rise to adverse effects on Arundel Park SSSI. Importantly, the Source S Drought Permit is supported by an Environmental Assessment Report which includes a comprehensive monitoring programme designed to better understand the potential for impacts and mitigate accordingly. This includes specific actions to ensure adverse effects on Arundel Park SSSI are avoided.

The potential for adverse effects on Duncton to Bignor Escarpment SSSI has also been identified owing to possible sensitivity to abstraction and the operation of the Source S Drought Permit. The EAR noted that while there is a potential pathway (Chalk aquifer) it was outside the zone of influence. It is considered that mitigation and monitoring set out in the Source S Drought Permit EAR would be sufficient so as to identify potential impacts and implications of groundwater level changes to environmental receptors.

5. Assessment of alternatives

Water resource planning is complicated and there is a lot of uncertainty, largely as it is an exercise in understanding the current water supply system that reflects past decision making processes, against future scenarios that are influenced by aspects such as climate change, population growth, changes in technology and economic outcomes. At all times, there is a need to ensure that the company can achieve a secure supply of water for the period 2025 - 2075. Where a risk of deficits in supply are identified, a series of 'demand side' (measures that reduce demand for water) and 'supply side' (measures that increase supply) Options are considered and incorporated into modelling, with the goal of identifying a preferred set of Options to meet the requirements and objectives of the Plan.

Traditionally, plans were developed to meet deficits at the least cost. Whilst this is still an important criterion, there are other factors which are considered. It was the aim of Portsmouth Water to develop a plan that represents 'best value'. A best value plan is defined as one that considers factors alongside economic cost and seeks to achieve an outcome that increases the overall benefit to customers, the wider environment and overall society. WRSE were tasked with developing the decision-making approach and tool (the investment model) that would be used by all companies in WRSE to select their preferred plan.

In addition to developing the BVP, and as required by the revised Water Resources Planning Guidelines (WRPG), further optimisation runs were also automatically shortlisted by the regional model, from the same suite of options, to benchmark and appraise the BVP against. All alternatives where constrained to securing a wholesome supply of water to customers and other sectors (multi-sector plan) over the planning period.

The options in the alternative plans therefore went through the same level of environmental assessment and used the same metrics that were derived by WRSE and were based on the UKWIR guidance, the National Framework, and the WRPG. Eight broad metrics used to develop Portsmouth Water's BVP and its alternatives including environmental, resilience and customer preferences. Full details of how the SEA informed the selection of options is described in Section 11.2 and further within the SoR: Additional Information Requested by Defra' document[4].

In addition to developing the BVP, and as required by the revised Water Resources Planning Guidelines (WRPG), further optimisation runs were also automatically shortlisted by WRSE, to benchmark and appraise the BVP against. All alternatives where constrained to securing a wholesome supply of water to customers and other sectors (multi-sector plan) over the planning period. WRSE developed two reasonable alternatives for each water company:

- **Least Cost Plan (LCP):** The model was run in adaptive mode, solving all the future branches and design drought conditions simultaneously, but optimising to minimise cost only (i.e., no other objectives are optimised). The outputs from various runs of the least cost plan helped to identify the options that are selected most frequently, and the potential tipping points along the adaptive pathways. This helped to inform decision-making around best value.
- **Best Environmental and Societal Plan (BESP)**: This programme is not optimised on cost, but the programme that Portsmouth Water consider delivers best overall environment and society value outcomes. This takes into account overall performance across the SEA, Natural Capital and Biodiversity Net Gain metrics, and through engagement with stakeholders.

Portsmouth Water considered the modelling outputs of the two strategic alternatives to consider what the plan would look like if it was optimised on Least Cost, or on producing the best environmental and social metrics. Table 5-1 sets out implementation dates of interventions and options Portsmouth Water need to deliver under each of the alternative plans. The results show that across the entire planning period the selection of options are consistent across each of the plans. This largely results from the requirement of demand reductions to meet Environmental Improvement Plan (EIP) targets (see section 2.2 for details). The consistency of the selection of options gives confidence in the option selection process for Portsmouth Waters plan.

Whilst the options remain consistent, the dates for two options selected deviate where the LCP and/or BESP select slightly differing times to implement the options for upgrading the existing Source O pumping station and increasing treatment capacity at Service Reservoir C. Source O Booster is selected in the BVP and LCP in 2033-34, whilst in the BESP it is selected one year later in 2034-35. Phase 2 of the additional treatment capacity at Reservoir sees the option implemented in the BESP in 2061-62, the LCP in 2063-64 and finally in the BVP in 2069-70

[4] PRT-WRMP24-Defra-Letter-Response_final.pdf (portsmouthwater.co.uk)

Table 5-1 - Options featuring in each of the Alternative Plans in comparison to the BVP

Options	BVP	BESP	LCP
Drought Permit: Source S	2025-26	2025-26	2025-26
Upgrade Source O Booster to 25Mld	2033-34	2034-35	2033-34
Import from Southern Water: Potable Resource for Otterbourne WSW to Source A (Import of potable water from Southern Water (SWSHSE) to the west of the supply area)	2039-40	2039-40	2039-40
Works A treatment capacity increase to treat and distribute water from Havant Thicket Reservoir	2046-47	2046-47	2046-47
	2046-47	2046-47	2046-47
	2048-49	2048-49	2048-49
New treatment works at Service Reservoir C to treat and distribute water from Havant Thicket Reservoir	2051-52	2051-52	2051-52
	2051-52	2051-52	2051-52
	2049-50	2061-62	2063-64
'High Plus' demand basket (including demand reductions, leakage and Government led interventions)	2025-26	2025-26	2025-26
Non-essential use bans	2025-26	2025-26	2025-26
Temporary use bans	2025-26	2025-26	2025-26

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Please see the WRSE SEA Report[5] for full discussion of this process and environmental findings made.

[5] WRSE Revised Draft Regional SEA Environmental Report, September 2023

6. Assessment of Options within fWRMP24

Previous Water Resource Management Plans were derived by considering costs that included the economic cost of delivering and operating a scheme, plus a carbon cost.

Portsmouth Water's WRMP24, along with five other water companies WRMPs in the south east, were produced alongside the Water Resources South East (WRSE) regional resilience Plan, in order to give a complete picture of the nation's water resources for the first time. The regional plan, and thereby water company plans, were derived by considering a wider set of criteria, that builds on a cost-efficient plan, ensuring that it delivers regulatory and government policy, whilst also protecting and enhancing the environment.

At the regional level, WRSE's plan is a 'best value plan' that delivers wider benefits to society. It considers a range of factors alongside economic cost in the identification of the preferred water resource programme. The development of a best value plan was promoted by the Environment Agency, Ofwat and Natural Resources Wales in the Water Resources Planning Guideline. WRSE were required to ensure the regional plan met several legal and regulatory requirements and policy expectations at the most efficient cost possible; however, through engagement with customers and stakeholders, the WRSE group identified a range of areas where it could go further. This means that the water resource programme that forms the basis of the WRSE regional plan might not be lowest cost, but it will deliver additional value in the areas that matter most to the people of the region.

WRSE developed the best value plan objectives, criteria, and metrics through a consultation process in 2021. The metrics were developed based on the UKWIR guidance, the National Framework, and the WRPG, to ensure the regional plan met legal, regulatory and policy expectations through a consultation process. Eight broad metrics used to develop the WRSE regional best value plan including Environmental (SEA positive, SEA negative, Natural Capital and BNG), resilience and customer preferences.

As the WRSE objectives were high-level, they were turned into measurable indices on which best value could be assessed. Each objective was represented by a set of value criteria which, in turn, had an associated metric[6] that measured the additional value it delivered. WRSE used the criteria and metrics to assess the different water resource programmes that were produced through investment modelling. WRSE also used them to compare the shortlisted good value programmes and explain the differences between them and the additional value each delivered. Each programme comprised a series of options and each option has a series of metrics associated with it.

Portsmouth Water further refined the option selection process by completing further environmental assessment work, including a refined SEA based on plan specific SEA framework and Level 2 assessments (HRA Appropriate Assessment and WFD Level 2). The metrics for the revised SEA and stage 2 assessments were in turn fed back into the regional model as part of the iterative option selection process.

The range of Options identified (along with the yield and year they are anticipated to be in service) are set out in Tables 6-1 and 6-2 below.

Supply Side Options

Table 6-1 - Supply Side Options in WRMP24

Option	Year in Service	Brief description
Upgrade Source O Booster (including the conjunctive use option benefit)	2033-34	Upgrade to pumping station to remove a 'bottleneck' in the supply network and improve movement of water through the system, to increase annual deployable output in the range of 4.1 Ml/d to 7.3 Ml/d (depending on the drought condition). Since the dWRMP24 this option has been revised to capture a shared conjunctive use of the scheme with Southern Water based on the updated

[6] By its nature SEA does not include numerical values for scoring effects. However, in order to incorporate environmental considerations directly into the programme appraisal optimisation model, a SEA metric was developed by WRSE to summarise the environmental performance of each option in numerical form. The SEA metric was developed from the results of the SEA, HRA and WFD assessment processes, and included non-monetised natural capital. For full details refer to WRSE's WRSE Regional Plan Environmental Assessment Methodology Guidance, WRSE / Mott Macdonald June 2020. wrse_file_1347_wrse-regional-plan-environmental-assessment-methodology-guidance.pdf

		modelling. The other key change is that the option has no benefit in a 'normal', non-drought year. This is to conserve water within Havant Thicket Reservoir ahead of a drought. This change in yield is one of the key factors that this option is now selected almost 10 years later in the fWRMP24.
Drought Permit Source S (to 2041)	2025-26	Between 2025-26 and 2040-41 Portsmouth Water will seek to use a drought permit at Source S in drought conditions. This option will improve the deployable output to 11 Ml/d. To enable the increase in supply from 2.5 Ml/d to 11 Ml/d, further works are required at the WTW site to upgrade the disinfection process, this includes new cartridge filters, a new UV treatment plant and uprated chlorination.
Bulk import of potable water from Southern Water (SWS HSE) to the west of the Portsmouth Water supply area (Otterbourne WSW to Source A)	2039-40	Reversal of flow in the existing and planned bulk supplies to Southern Water (i.e. once Southern Water has more water in Hampshire, bulk supplies from Portsmouth Water to Southern Water will largely end and instead potable supplies from Southern Water will be received to Portsmouth Water). This option is first selected for use in 2039-40 as providing 25.25 megalitres per day (Ml/d) under dry year annual average conditions. The volume gradually increases to 45 Ml/d from 2046-47 for the remainder of the planning period.
Continue existing bulk supplies to Southern Water	2025-26	This is the Portsmouth Water export to SWS SNZ and SWS HSE Zones. These exports are part of the baseline until 2025-26 and 2028-29 respectively, after which they become optional. Over the planning period exports gradually reduce and eventually becomes zero. This results from less water available in the Portsmouth Water supply network due to higher levels of Environmental Protection.
Additional treatment capacity of 20 Ml/d at Works A and additional pipeline to utilise water from Havant Thicket Reservoir. This includes subsequent upgrades to increase treatment capacity further.	2046-47	Works A increased treatment capacity (phase 1). This option improves treatment capacity to treat water across the Portsmouth Water supply area to utilise the water most effectively from Havant Thicket Reservoir and is selected from 2047 onwards. This option was only selected in the alternative pathways of the dWRMP. Due to greater sustainability reductions resulting from Environmental Destination this option is now selected in the BVP Pathway 4.
	2046-47	Additional pipeline (phase 1). This option improves interconnectivity to transfer water across the Portsmouth Water supply area to utilise the water most effectively from Havant Thicket Reservoir and is selected from 2047 onwards. This option was only selected in the alternative pathways of the dWRMP. Due to greater sustainability reductions resulting from Environmental Destination this option is now selected in the BVP Pathway 4.
	2048-49	Works A increased treatment capacity (phase 2). This option was only selected in the alternative pathways of the dWRMP. Due to greater sustainability reductions resulting from Environmental Destination this option is now selected in the BVP Pathway 4.
A new 10 Ml/d WTW at the location of Service Reservoir C from the early	2049-50	New treatment works at Service Reservoir C (Phase 1). This option improves treatment capacity to treat water across the Portsmouth Water supply area to utilise the water most effectively from Havant Thicket Reservoir and is selected from 2047 onwards. Due to greater sustainability reductions resulting from Environmental Destination this option is now selected in the BVP Pathway 4.

2050s to utilise water from Havant Thicket Reservoir. This includes serval phased enhancements and upgrades.	2049-50	New pipeline (Phase 1). This option improves interconnectivity to transfer water across the Portsmouth Water supply area to utilise the water most effectively from Havant Thicket Reservoir and is selected from 2047 onwards. Due to greater sustainability reductions resulting from Environmental Destination this option is now selected in the BVP Pathway 4.

Demand Side Options

Table 6-2 - Demand Side Options in WRMP24

Option	Year	Brief Description
Demand Basket "High Plus"	2025-26	Home water efficiency audits outside of the smart metering programme Education Community Reward Platform General broadcast messages (multi-channel proactive comms) Community campaign Leak Alarms (e.g., Leakbot) Universal smart metering (Non-Household and Household)Household flow reduction (pressure control) Household Incentives: Innovative tariffs Non-Household efficiency checks / audits Vulnerability / Inclusion and Equality Active leakage control Leading by example
Non-essential use bans	2025-26	Non essential use bans for non-households. From the start of the plan in 2025–26.
Temporary use bans	2025/26	Temporary use bans for households. From the start of the plan in 2025–26.

Each Option has been assessed against the SEA Framework in respect of construction and operation phases and considering positive and negative effects separately.

To allow for the identification of different levels of effects when assessing the WRMP24 proposals, a scoring system has been used to differentiate in terms of magnitude and significance of effects. This scoring system is widely used in SEA and is based around the following scale (colour aligned with WRSE scale) to reflect the assessment aid questions in the SEA Framework.

Table 6-3 - Assessment Scoring Scale

Assessment Scale	Assessment Category	Significance of Effect
+++	Major beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Major adverse	

This scoring system seeks to capture both the nature and the scale of predicted effects arising from the Options set out in the WRMP24. Alongside the overall summary rating (colour and symbol), the assessment tables attempt to identify the nature of the effects of the WRMP24 on the SEA objectives according to the level of detail required by the SEA Directive.

It is to be noted that the scores derived will be considered 'in the round' in light of the assessment aid questions (detailed in the SEA Framework) and a judgement made as to an appropriate summary score for that aspect of the WRMP24 being considered. The commentary provided explains the rationale behind the score. Any recommendations are noted, as are references to appropriate additional mitigation that is proposed to maximise beneficial effects and/or minimise/avoid any potential adverse effects identified.

This scoring system seeks to capture both the nature and the scale of predicted effects arising from the Options set out in the WRMP24. Alongside the overall summary rating (colour and symbol), the assessment tables attempt to identify the nature of the effects of the WRMP24 on the SEA objectives according to the level of detail required by the SEA Directive. This includes commentary on the effects, magnitude, scale, duration, permanence and certainty as shown in Table 5-4.

Table 6-4 - Characteristics of effect

Magnitude (size of effect)	Scale (implications of effect)	Duration (length of time over which effect will be present)	Permanence (lasting of effect)	Certainty (that effect will occur)
Large (L) Medium (M) Small (S)	Local (L) Regional (R) National (N) Global (G)	Long term (LT) Medium term (MT) Short term (ST)	Temporary (T) Permanent (P)	High (H) Medium (M) Low (L)

6.1. Overview of assessment results

The following tables provide an overview of the assessment 'scores' for all of the Options considered within the SEA, for both the construction and operation phases (post mitigation).

Table 6-5 - Construction Scores (Post Mitigation)

	Biodiversity		Soil		Water		Air Quality		Greenhouse Gas Emissions		Climate Factors				Landscape		Cultural Heritage		Population and human health				Material Assets			
	To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain		To Protect and enhance the functionality, quantity and quality of soils		To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats		To reduce and minimise air and noise emissions		To achieve Portsmouth Water target of reducing carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050		To reduce vulnerability of built infrastructure to climate change risks and hazards		To reduce or manage flood risk, taking climate change into account		To conserve, protect and enhance landscape, townscape and seascape character and visual amenity		To conserve, protect and enhance the historic environment and heritage assets, including archaeological remains		To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing		To maintain and enhance tourism and recreation		To minimise resource use and waste production		To avoid negative effects on built assets / infrastructure	
Option Name	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Upgrade Source O Booster to 25Mld	0	-	0	0	0	0	0	-	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	-	0	-
Source S drought permit	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
New treatments work at Service Reservoir C to treat water from Havant Thicket	0	-	0	-	0	-	0	-	0	-	0	-	0	0	0	-	+	-	+	-	0	-	0	-	+	-
New pipeline at Service Reservoir C to distribute water from Havant Thicket Reservoir	0	-	0	-	0	-	0	-	0	-	0	0	0	0	0	-	+	-	0	-	0	-	0	-	0	-
Works A treatment capacity increase to treat water from Havant Thicket (Phase 1)	0	0	0	0	0	0	0	-	0	-	0	0	0	0	0	0	0	-	0	-	0	-	+	-	0	-
Works A treatment capacity increase to treat water from Havant Thicket (Phase 2)	0	0	0	0	0	0	0	-	0	-	0	0	0	0	0	0	0	-	0	-	0	-	+	-	0	-
New pipeline at Works A to distribute water from Havant Thicket (Phase 1)	0	-	0	-	0	-	0	-	0	-	0	0	0	-	0	-	+	-	0	-	0	-	0	-	0	-
'High Plus' Basket	0	-	0	-	0	-	0	-	0	-	0	0	0	0	0	-	0	-	0	-	0	0	0	-	0	-
NEUBS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TUBS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 6-6 - Operation Scores (Post Mitigation)

	Biodiversity		Soil		Water		Air Quality		Greenhouse Gas Emissions		Climate Factors				Landscape		Cultural Heritage		Population and human health				Material Assets			
	To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain		To Protect and enhance the functionality, quantity and quality of soils		To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats		To reduce and minimise air and noise emissions		To achieve Portsmouth Water target of reducing carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050		To reduce vulnerability of built infrastructure to climate change risks and hazards		To reduce or manage flood risk, taking climate change into account		To conserve, protect and enhance landscape, townscape and seascape character and visual amenity		To conserve, protect and enhance the historic environment and heritage assets, including archaeological remains		To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing		To maintain and enhance tourism and recreation		To minimise resource use and waste production		To avoid negative effects on built assets / infrastructure	
Option Name	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Upgrade Source O Booster to 25Mld	0	-	0	0	+	-	0	-	0	-	0	-	0	0	0	0	0	0	0	0	0	0	0	0	+	0
Source S drought permit	0	--	0	0	+	--	+	-	+	-	++	-	0	0	0	0	0	-	++	0	0	0	++	0	+	0
New treatment works at Service Reservoir C to treat water from Havant Thicket	0	0	0	0	+	0	0	-	0	-	++	0	0	0	0	-	0	-	++	-	0	0	0	0	0	0
New pipeline at Service Reservoir C to distribute water from Havant Thicket Reservoir	0	-	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	-	0	0	0	-	0	0
Works A treatment capacity increase to treat water from Havant Thicket (Phase 1)	0	0	0	0	+	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Works A treatment capacity increase to treat water from Havant Thicket (Phase 2)	0	0	0	0	+	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New pipeline at Works A to distribute water from Havant Thicket (Phase 1)	0	-	0	0	+	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
'High Plus' Basket	++	0	0	0	++	0	+	0	+	0	+	0	+	0	+	0	0	0	+	0	0	0	++	0	0	0
NEUBS	+	-	0	-	+	0	+	0	+	0	+	0	0	0	0	-	0	0	0	-	0	-	+	0	0	-
TUBS	+	-	0	-	+	0	+	0	+	0	+	0	0	0	0	-	0	0	0	-	0	-	+	0	0	-

Assessment of the Options outlined considered both construction effects and those which are anticipated to occur during operation of the Option. A series of mitigation measures were also identified, with the aim of reducing or nullifying any adverse effects, while potentially maximising any beneficial effects from the Option.

The assessments have shown that it is anticipated that during construction, once mitigation has been applied, the Options within WRMP24 will not result in significant effects, though a range of adverse effects have been identified. These adverse effects relate mainly to issues that would be expected of any construction project such as, for example effects on biodiversity (Objective 1), air and noise emissions (Objective 4), carbon emissions (Objective 5), visual amenity (Objective 8) resource use and built assets (Objectives 12 and 13) due to the requirement for materials and potential effects on the transport network.

Construction also provides the opportunity for some beneficial effects with respect to a number of options, though these would also be non-significant. For example, in relation to Drought Permit Source S, a small number of slight beneficial effects are anticipated in respect of Objective 3 (water quality) as it will help ensure water supply during drought conditions, Objective 4 and 5 (air, noise and carbon emissions) as it may help reduce the need for additional intensive external transfers and abstractions with greater emissions implications. In addition, slight beneficial effects are anticipated in respect of Objective 13 (built assets / infrastructure) as the drought permit may act to alleviate demand restrictions which have the potential to impact on built assets by enforcing cleaning and maintenance restrictions.

During Operation, a greater number of significant effects have been identified once mitigation has been applied. For the most part, these significant effects are beneficial, though potential adverse effects have been identified in respect of the Drought Permit Source S relating to Biodiversity (Objective 1) and water (Objective 3). Further assessment has noted that these effects may not materialise, but this would need further confirmation and a precautionary approach has been taken in respect of the SEA scoring.

Noted beneficial effects during operation include those relating to reducing vulnerability to climate change (Objective 6), maintaining the health and wellbeing of the local community (Objective 10) and minimising resource use and waste production (Objective 12).

In terms of beneficial effects, demand management Options provide great potential. This is mainly due to the clear rationale of these measures leading to a reduced need for water abstraction and treatment, leading to keeping more water in the environment and reducing pressures on water sources, as well as a reduced need for infrastructure development. Major beneficial effects are anticipated from the ‘Demand Basket High Plus’ Option in this regard. It is also considered that these measures would have beneficial effects in terms of biodiversity, again from keeping water in the environment and reducing pressure on sources.

Reducing demand for water will also result in beneficial effects in relation to the need for pumping and treatment, which will help reduce air, noise and carbon emissions, maintaining public health and wellbeing, reducing the requirement for resource use and helping to avoid adverse effects on built assets. On the whole though, these effects while welcome, are not considered to be significant.

Conversely, slight adverse effects were also identified. Typical examples can be seen through those identified in relation to ‘Non-Essential Use Bans’ where anticipated slight adverse effects include in relation to Biodiversity (Objective 1), the restrictions on watering plants and using hosepipes may have minor adverse effects on pollinators, insects, fish (domestic ponds) and birds (bird baths) where gardens are found to support such biodiversity. There could also be effects on soils (Objective 2) through dust generation and erosion e.g. in gardens or other such open spaces. Lack of ability to water open spaces or operate ornamental fountains etc. could impact visual amenity and landscapes (Objective 8). Non-essential use ban is likely to have minor negative effects on the community and social well-being (Objective 10) as there will be restrictions on irrigation of gardens and allotments and use of water for recreational purposes. There may also be a small increased risk of fires in allotments as vegetation dries out. Risk to human health and wellbeing may also be increased where dust suppression measures cannot be implemented and cleaning of paths and other infrastructure restricted. This may increase health and safety risks. Assuming commercial properties including gardens are exempt from bans and restrictions there is likely to be only a minor effect on tourism and recreation (Objective 11). Non-commercial tourism sites may be affected. In addition, while temporary, the Option is likely to impact on the maintenance of buildings and industrial plant (Objective 13).

It is considered that all slight adverse effects will be short term and temporary and confined to the local scale.

It is important to recognise that the Demand Management Options will apply across the whole of the Portsmouth area and are anticipated to have cumulative beneficial effects from reducing the demand for water. For example, while Demand Management Options such as NEUBs and TUBs would typically be implemented in a phased, sequential manner, it is the intention that such measures will act to reduce pressure on water resources by reducing demand for water and as such, reduce the need for abstraction, treatment and onward pumping. This will act cumulatively across the Plan area and into nearby / linked resource areas. Savings in

water would likely have cumulative beneficial effects in respect of resilience to biodiversity (Obj. 1), the water environment (Obj. 3), reducing carbon, air and noise emissions (Obj. 4 and Obj. 5), climate change (Obj. 6), maintaining health and wellbeing (Obj. 10), as well as minimising resource use (Obj. 12). While some of the savings made are anticipated in themselves small and benefits would be slight, it is to be noted that cumulatively effects could be significant and of importance given that these will be implemented in a drought situation when the environment is naturally under stress. Other Demand Management measures would apply at all times and act cumulatively to continually reduce pressure on sources, with consequent permanent benefits for people and the environment.

7. Mitigation

The term mitigation encompasses any approach that is aimed at preventing, reducing or offsetting any significant adverse environmental effects that have been identified. In practice, a range of measures applying one or more of these approaches is likely to be considered in mitigating any significant adverse effects predicted as a result of implementing the WRMP24. In addition, it is also important to consider measures aimed at enhancing positive effects. All such measures are generally referred to as mitigation measures.

However, the emphasis should be in the first instance on proactive avoidance of adverse effects. Only once alternative options or approaches to avoiding an effect have been examined, should mitigation then examine ways of reducing the scale / importance of the effect.

Mitigation can take a wide range of forms, including:

- Refining Intervention measures in order to improve the likelihood of positive effects and to minimise adverse effects;
- Technical measures (such as setting guidelines) to be applied during the implementation phase;
- Identifying issues to be addressed in project assessment, such as Environmental Impact Assessment and the development of Environmental Management Plans for certain projects or types of project;
- Proposals for changing other plans and programmes; and
- Contingency arrangements for dealing with possible adverse effects.

A number of mitigation approaches have been used throughout the development of the Water Resource Management Plan, in order to mitigate potential effects (significant or otherwise). Of note is that within a number of Options, ‘embedded mitigation’ has been considered. ‘Embedded mitigation’ is mitigation that has been incorporated into the development of the Option and is set out for each Option. Through the SEA process, further ‘additional mitigation’ has also been identified and this is also set out in in the SEA report (Section 12). ‘Additional mitigation’ is mitigation that is required to address specific issues relating to significant effects in addition to ‘embedded mitigation’ and identified through the SEA process.

Note that Portsmouth Water are committed to ensuring that mitigation is applied at all appropriate stages of planning and design and will be implemented on site during construction. Mitigation will be further developed through for example the Environmental Impact Assessment process which would apply to many of the Options within the Plan.

8. Cumulative, synergistic and indirect effects

As noted in the SEA Directive, there is a requirement to consider secondary, cumulative and synergistic effects of implementation of the WRMP24. Secondary effects are effects that are not a direct result of the WRMP24, but which occur away from the original effect or as the result of a complex pathway. Cumulative effects arise where several proposals or elements individually may or may not have significant effect but in-combination have a significant effect due to spatial crowding or temporal overlap. Synergistic effects are when two or more effects act together to create an effect greater than the simple sum of the effects when acting alone.

Following consultation from Natural England on the draft WRMP24 SEA, concerns raised relating to the methodology used to complete the In-Combination assessment, have been addressed in this fWRMP24 SEA. The methodology used has been developed in discussion with Natural England and satisfies their concerns and is considered appropriate to the level of detail available for the Options outlined in the fWRMP24.

8.1. Likely cumulative effects

WRMP24 options which have the potential for cumulative effects have been identified (as required by the SEA Regulations) from the analysis of plans and programmes, the baseline data, consultation responses and an examination of the identified key issues and cumulative, synergistic and indirect effects have also been considered during the SEA. Assessment of in-plan cumulative effects was informed by the HRA and WFD assessments undertaken.

8.2. In-plan cumulative effects

The results of the direct effects of the WRMP options are discussed in Chapters 9 and 10 of the SEA Report. It is considered that the options can interact cumulatively across environmental issues either through construction or operation.

8.2.1. Construction In-plan cumulative effects

There are 17 supply options that feature in Portsmouth Waters BVP however many of these are already in operation and represent extensions to existing baseline conditions.

It is anticipated that construction or repair / refurbishment works could result in cumulative effects on water quality due to increased potential for contamination of the water environment during construction activities although it is not anticipated that effects would be significant. It is anticipated that best practice construction measures would be implemented including provision of Construction Environmental Management Plans (CEMP) which outline measures to protect the water environment. For example, this would require the use of spill kits and other measures to be taken in the event of a pollution incident. Other identified cumulative effects include on dust, soil, noise, air quality and traffic, though these are also not considered likely to be significant. Issues could also be addressed through a CEMP, a Traffic Management Plan or specific measures such as noise barriers. It is important to note that most construction activities will be limited in scale to a particular area and will likely not overlap in a timeframe with other Schemes.

However, while the specific location of most of the Options is known, it is not possible to know at this stage precisely where measures taken under the approaches to ‘Demand Management’ will take place. These could include works such as leakage reduction on trunk mains or at reservoirs. However, such activities and their consequent effects are anticipated to be small scale and will be localised to specific areas (reservoirs or trunk mains). It is also anticipated that in general such works would be undertaken at a wide spatial scale (i.e. at various locations across the Portsmouth area) and likely to be undertaken on a rolling programme, with little or no overlap in terms of location and undertaken at different times.

8.2.2. Operational In-plan cumulative effects

Many of the supply side options that feature in the BVP represent existing options that are reflected in the baseline conditions and therefore unlikely to give rise to cumulative effects.

It is anticipated that the Demand Management Options noted in WRMP24 will apply across the whole of the Portsmouth area and are anticipated to have cumulative beneficial effects from reducing the demand for water. For example, while Demand Management Options such as NEUBs and TUBs would typically be implemented in a phased, sequential manner, it is the intention that such measures will act to reduce pressure on water resources by reducing demand for water and as such, reduce the need for abstraction, treatment and onward pumping. This will act cumulatively across the Plan area and into nearby / linked resource areas. Savings in water would likely have cumulative beneficial effects in respect of resilience to biodiversity (Obj. 1), the water environment (Obj. 3), reducing carbon, air and noise emissions (Obj. 4 and Obj. 5), climate change (Obj. 6), maintaining health and wellbeing (Obj. 10), as well as minimising resource use (Obj. 12). While some of the savings made are anticipated in themselves small and benefits would be slight, it is to be noted that cumulatively effects could be significant. Other Demand Management measures would apply at all times and act cumulatively to continually reduce pressure on sources, with consequent permanent benefits for people and the environment.

Operation of Options could result in adverse cumulative effects in relation to Greenhouse Gas emissions and a recommendation is made to investigate the use of renewable energy sources during operation. It is also noted

that further consideration is to be made at planning and design stage of potential for effects on landscape and population health from a small number of Options due to their location. Appropriate mitigation is to be developed at that time, in light of precise scheme details.

8.3. In-combination cumulative effects with other plans and projects

The SEA has also considered a large number of other plans and projects that might lead to cumulative effects when combined with the WRMP. Within these plans, there are measures set out which could result in construction activities (of potentially significant scale), or operational plans. However, as noted above, it is anticipated that construction activities related to Options within fWRMP24 will be small scale and of localised effect. A range of mitigation measures have been noted within this SEA which would act to reduce effects, many of which could be included in construction Environmental Management Plans – these would be further developed through detailed scheme design and would reflect conditions and context prevailing at that time. In addition, it is to be expected that all major infrastructure such as that which may arise from other Plans, will be developed within the appropriate Planning framework and will itself be subject to measures to ensure cumulative effects are addressed. As such, no significant cumulative effects are anticipated in respect of other plans in relation to any of the SEA Objectives at this stage.

A key element of the wider Portsmouth Water approach to water management is the development of the Havant Thicket reservoir. Clearly this project will require significant construction activities, but it is anticipated that there will be no construction cumulative effects for the reasons outlined above (the Options within fWRMP24 being relatively small scale in construction / refurbishment terms, the mitigation measures identified, and the expectation of the reservoir being developed within a strictly controlled construction and planning framework).

It is considered that there will be no cumulative effects between the Demand Management Options within fWRMP24 and the Havant Thicket development, other than these will increase the availability of water from the reservoir (by reducing demand across the water resource zone).

There are also a number of other projects in proximity to the Portsmouth Water area, which are of national significance and could potentially have cumulative effects with Options set out in the fWRMP24. In addition to the water sector Strategic Reservoir Options and pipelines, these Nationally Significant Infrastructure Projects are in a range of sectors including the energy and transport. While no cumulative effects with Options in fWRMP24 have been identified, recommendations for liaison with the bodies responsible for these Projects should take place. It is also noted that these Projects would be developed within the wider planning framework that would require close adherence to environmental legislation and assessment. This will result in a range of mitigation to address all significant impacts and would also consider the potential for cumulative effects in light of conditions and construction timing prevailing at that time.

8.4. Cumulative effects with neighbouring water companies

A key focus of the in-combination assessment with other plans and policies is that of neighbouring water companies, specifically supply options contained in their respective WRMPs. There is potential for Portsmouth Water's fWRMP24 options to interact cumulatively either through construction or operation with options contained in the following, neighbouring water companies fWRMP24:

- Southern Water, and
- South East Water.

Portsmouth Water have engaged with both of the neighbouring water companies in order to understand the nature of their respective WRMPs, the options contained and the likely effects arising through assessments including SEA, HRA, WFD and other supporting technical work.

No cumulative effects were identified with any of the 24 supply options featuring before 2055 in the South East Water plan.

In respect of Southern Water, 54 options in their Plan are anticipated to be developed prior to 2056. Of these, six options are within 1km of a Portsmouth Water option, though only one is anticipated to be constructed within 5 years of other options. As such, for the most part, no construction cumulative effects with Southern Water options are identified. One option though has been identified as having the potential for cumulative effects on the Meon surface water body – this issue is addressed, and mitigation proposed within the Southern Water fWRMP24 SEA Report.

During operation, potential cumulative effects with a number of Southern Water options have been identified in respect of Greenhouse Gas emissions and it is suggested that investigation is made of the use of renewable

energy sources to support operational energy requirements. It is also acknowledged that some particular elements of options are not yet known e.g. precise location of certain elements of infrastructure. It is therefore noted that clarification in respect of such infrastructure should be made, alongside assessment of elements such as noise emissions. Depending upon findings, mitigation would be required to ensure no nuisance results.

In addition, WRSE have completed a regional ICA to ensure consistency and ensure no potential in combination effects have been overlooked. Reference should be made to the WRSE regional plan report in respect of cumulative effects of Options across Plan boundaries.

9. Monitoring

The SEA Regulations state that 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 appropriate remedial action'*. In addition, the Environmental Report should provide information on a '*description of the measures envisaged concerning monitoring*'.

In line with the SEA Regulations, monitoring will cover significant environmental effects and it will involve measuring indicators that will allow identification of links between the implementation of the WRMP24 and the likely significant effects (both positive and negative) being monitored. The SEA Regulations make clear that it is not necessary to monitor everything, or to monitor an effect indefinitely, rather monitoring should focus on those identified significant environmental effects. Guidance states that it is inappropriate to monitor everything, and monitoring proposals should be focused on the following areas:

- Identify potential breaches of international, national, or local legislation, recognised guidelines, or standards.
- Actions which may give rise to irreversible damage, with a view to identifying trends before such damage occurs.
- Where there was any uncertainty in the SEA and where monitoring would enable prevention or mitigation measures to be taken.

In short, it is the intention that the results of the monitoring will be of particular benefit to those involved with the further iterations of the WRMP24 (which will be of particular importance to help further consideration of this Adaptive Plan) and if required, will allow early remediation to be undertaken of any identified adverse effects.

It should be noted that many of the effects identified that would arise from implementation of the Options contained within the WRMP24 will be experienced during construction of infrastructure only and will not be experienced during operation of these facilities. In these circumstances monitoring will be restricted to the construction phase only.

It is also to be noted that as options are brought forward for development, further specific monitoring requirements may be incorporated 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.

It is also the case that a number of Options within the WRMP24 are continuations or expansions of existing operational practice and are subject to existing regulatory requirements. At present Portsmouth Water undertake water quality monitoring data from a series of boreholes, in order to demonstrate compliance with water quality standards. In addition, monitoring is undertaken in respect of groundwater levels and river flows, along with some general environmental monitoring in certain catchments. Use is also made of a range of monitoring carried out by stakeholder organisations such as Environmental Agency and adjacent water companies such as Southern Water. It is anticipated that this monitoring will continue.

Please note that in addition to the monitoring proposed in relation to the SEA of the WRMP, Portsmouth Water also already undertake a series of monitoring in relation to Water Industry National Environment Programme (WINEP). This WINEP monitoring will act to further boost understanding of the effects of the existing water supply infrastructure and its operation and can also be used to help inform future iterations of the WRMP.

10. Summary and Conclusions

The SEA and other assessments carried out throughout the development of fWRMP24 has been thorough and comprehensive. Assessment was made of an initial long list of sites and environmental issues were considered through all stages of short listing and Option development. This was at both a regional level (carried out by WRSE) and at a more 'local' level that considered issues in light of the environmental context of the Portsmouth area. Consideration of both the regional and local level has meant that two SEA teams have been involved and have acted independently of each other, though liaison has been maintained and results of assessments shared. These teams have also liaised closely with the Portsmouth Water WRMP making team and have challenged the Plan development team when appropriate.

Based on the findings of the SEA, it is possible to recognise a number of key considerations and draw conclusions with regards to the WRMP24 and its 'environmental performance'. These are outlined as follows.

In the first instance, it is important to recognise that while WRMP24 clearly fits within a regional context, it also needs to reflect the issues and opportunities of the Portsmouth Water area. Similarly, there are a range of challenges and uncertainties facing both the region and the Plan area. Notably these include climate change and the need for increased climate resilience, water stress, population growth, along with economic uncertainties. Of particular note within the Portsmouth Water area is that there is a need to reduce reliance on chalk aquifers and this has been a key consideration within the development of the fWRMP24 and a significant driver of proposed new Options and investment required. The approach to assessment made, of considering wider regional issues (by WRSE), as well as considering a 'local' Portsmouth baseline and review of relevant plans and policies to develop a bespoke SEA Framework has resulted in an enhanced understanding of environmental issues in the Plan area and the surrounding region and this has allowed full and robust consideration of Options proposed under fWRMP24.

Another key driver to development of this fWRMP24 has been the introduction of the Environmental Improvement Plan (as part of the Government's 25 Year Plan) in April 2023 (post-draft plan submission). As a result, the fWRMP24 demand options have been reviewed to meet the demand reductions required under the EIP. These targets are more challenging than those proposed for the dWRMP24 and as a result there are a limited number of demand options available to meet these expected reductions.

The Adaptive plan approach that has been developed, recognises the inherent uncertainties involved in water resource planning and has been specifically designed to help water companies adopt a forward-looking approach to allow companies to plan for schemes that may be required from 2025 and beyond. The essence of this approach is that the Plan can adapt depending on which of the potential future scenarios identified occurs.

Consideration of WRSE of the adaptive planning approach identified the following three plans:

- Best Value Plan – Investment model pareto runs for Best Value Plan metrics (Customer Preference, SEA+, SEA-, Natural Capital, Carbon, Resilience (reliability, adaptability, evolvability), intergenerational equity), this is optimised on both individual Best Value Plan and cost metrics
- Least Cost Plan – Investment model run result when optimising on cost only
- Best Environmental and Societal plan - Removes the resilience metrics from the Best Value Plan

Examination was made of the trade-offs between the anticipated additional value that different portfolios of options could provide against the least cost criterion to try to derive something that is best value – for the environment, society and Portsmouth Water customers. The fWRMP24 has taken the adaptive planning approach and having identified the three Plan types, further identified what is considered the most realistic scenario, alongside the most realistic future pathway and from this has outlined a series of supply options (i.e. those which in general will increase the amount of water in the supply system), alongside a series of demand options (i.e. those which will act to reduce the need for water). Having identified the Options in the Best Value Plan, WRSE carried out initial assessment of these for SEA and the associated environmental assessments of Habitats Regulations Assessment, Water Framework Directive, Biodiversity Net Gain, Natural Capital Assessment and Invasive Non-Native Species. These assessments were further built upon by Portsmouth Water, with a particular emphasis on trying to identify issues of note in a local context. In addition, further assessment was undertaken of potential effects on heritage assets and SSSI's.

It is important to note that there were a series of Options that are also included but which were not subject to SEA for a range of reasons such as they are existing bulk supplies, previously approved bulk supplies, are associated with Options in adjacent water companies (and as such considered under the SEA of both WRSE and that water company), or are part of the Havant Thicket Option.

Havant Thicket Reservoir is a key legacy from WRMP19, which has formed a cornerstone of Portsmouth Waters ongoing planning process. The Reservoir enables Portsmouth Water to store winter spring flows for use in the summer, increase the quantity of water supplied to Southern Water, which in turn allows them to make environmental improvements by reducing their reliance on sensitive chalk sources in Hampshire. In addition to supporting reduced abstraction on chalk rivers, the scheme has an overall biodiversity net gain and will offer a new community leisure facility for the area.

The reservoir scheme, as proposed in WRMP19, is unchanged and has been included in the baseline assumptions for this plan (with a revised delivery date of 2031/32). It was supported by customers and regulators and is being developed in partnership with Southern Water. This will be the first new reservoir to be built in the South East since the 1970s. Havant Thicket Reservoir has received planning permission and work onsite is ongoing.

Assessment of the Options outlined considered both construction effects and those which are anticipated to occur during operation of the Option. A series of mitigation measures were also identified, with the aim of reducing or nullifying any adverse effects, while potentially maximising any beneficial effects from the Option.

It is anticipated that three of the Options (Source S drought permit, NEUBS and TUBS) within fWRMP24 will not require any construction activities. Construction activities are anticipated in relation to the implementation of all other Options, although where adverse or beneficial effects were identified they were not considered significant. Such construction effects for these Options are anticipated to be in the most part local scale, short term and temporary to the construction / repair phase.

During operation, effects have been identified for all options, with significant adverse effects in relation to the Drought Permit: Source S, and significant beneficial effects in relation to Drought Permit: Source S, New treatment works at Service Reservoir C to treat water from Havant Thicket and ‘High Plus’ Basket options.

Drought Permit: Source S, is anticipated to have moderate adverse impacts in terms of biodiversity (Objective 1) due to the likely impacts on designated sites and on water (Objective 3) as there is a possible risk of WFD status deterioration on Chichester Chalk groundwater body. These effects are anticipated to be short term, temporary, and regional in relation to biodiversity whilst effects are expected to be local for water.

Moderate beneficial effects are anticipated for 'High Plus' Demand Management Basket for both biodiversity (Objective 1) water (Objective 3) due to awareness campaigns, retrofitting, metering and leakage reduction works resulting in water being kept within the environment.

Both Drought Permit: Source S and New treatment works at Service Reservoir C to treat water from Havant Thicket are anticipated to have moderate beneficial effects in respect of climate change (Objective 6) due to the increased resilience they provide. Moderate beneficial effects are also anticipated for health and wellbeing (Objective 10) for these two options by improving the resilience of water supply.

Drought Permit: Source S and 'High Plus' Basket are anticipated to have moderate beneficial effects on resource use (Objective 12) as the drought permit has the potential to reduce the need for more resource intensive external transfers and abstractions and 'High Plus' Basket will reduce resource use and wastage.

During operation of Drought Permit: Source S these effects are anticipated to be short term, temporary and local with the exception of biodiversity which would be regional. For 'High Plus' Basket and New treatment works at Service Reservoir C to treat water from Havant Thicket effects are anticipated to be long term, permanent and local with the exception of biodiversity for 'High Plus' Basket which would be regional.

Another important element within fWRMP24 that will have ongoing beneficial effects is the Havant Thicket Reservoir and associated elements. As this Option has been granted planning permission it has not been specifically considered in this SEA, but it is worth noting here as its presence allows for this fWRMP24 to concentrate on measures such as Demand Management, with consequent benefits for the environment. The development of the Havant Thicket reservoir itself is anticipated to secure more reliable water supplies for the South East region. Portsmouth Water anticipate that by using the reservoir to supply their own customers, they can then share supplies from other water sources with Southern Water. This will mean Southern Water will be able to reduce the amount of water that they take from the Chalk Rivers Test and Itchen in Hampshire, which as noted in fWRMP24, are rare and sensitive chalk streams and are considered of particular value.

It is recognised that WRMP24 will not act or be delivered in isolation and will influence and be influenced by other Plans and Policies or developments across and beyond the Portsmouth Water area and the south east as a whole. While there is a potential for cumulative effects during construction, it is anticipated that for the most part construction works associated with the WRMP are anticipated to be relatively small scale, with localised effects and for the most part likely to be spatially and temporally isolated from major infrastructure developments. A range of mitigation measures have been noted within this SEA which would act to reduce effects, many of which could be included in construction Environmental Management Plans – these would be

further developed through detailed scheme design and would reflect conditions and context prevailing at that time. In addition, it is to be expected that all major infrastructure such as that which may arise from other (non-water sector) plans, will be developed within the appropriate planning framework and will itself be subject to measures to ensure cumulative effects are addressed.

Nevertheless, there is a potential that individual options could act cumulatively with options within other water company areas to produce adverse effects and WRSE have identified that in a drought event where emergency drought groundwater options were operational, an in-combination effect would occur which could lead to temporary reduction in groundwater levels, leading to potential changes in the water balance and surface water dependant status elements. Similarly, WRSE identified that the Recharge of Havant Thicket reservoir from Budds Farm, cumulative adverse effects, including significant adverse effects, have been identified across a range of objectives owing to its proximity to adjacent Southern Water options.

While many aspects of WRMP24 are anticipated to result in beneficial effects, it is important that Portsmouth Water understand the effect of implementation of WRMP24, particularly in regard to those areas where significant adverse effects could occur. Portsmouth Water already undertake water quality monitoring data from a series of boreholes, in order to demonstrate DWI compliance. In addition, monitoring is undertaken in respect of groundwater levels and river flows, along with some general environmental monitoring in certain catchments. Use is also made of a range of monitoring carried out by stakeholder organisations such as Environmental Agency and adjacent water companies such as Southern Water. It is anticipated that this monitoring will continue – indeed this will continue to form a cornerstone of the ongoing WINEP programme that Portsmouth Water undertake in cooperation with Environment Agency to set out their pathway for environmental destination. In addition, a series of monitoring measures have been noted through this SEA that could be incorporated into Environmental Management Plans for both the construction and operation phases of Option, or which could be applied across Portsmouth Water to help understand how implementing WRMP24 will interact with the Objectives of the SEA. This would allow early identification of unforeseen adverse effects, as well as crucially build up an evidence base to inform consideration of future iterations of this adaptive plan.

In conclusion, Portsmouth Water have developed a final Water Resource Management Plan (fWRMP24) which has been subject to a set of thorough and comprehensive environmental assessments, at both a regional level and at a level local to the Portsmouth Water area. The assessments undertaken have been consistent in approach and resulted in iterative development of the Plan, thereby allowing the Plan to be developed in the context of a thorough understanding of the key environmental issues and constraints of the Portsmouth Water area and beyond. This allowed for a robust consideration of alternatives to the Plan and allowed identification of a Preferred set of Options. The range and significance of anticipated effects to be anticipated from implementation of the fWRMP24, including both beneficial and adverse, have been identified and mitigation proposed where required. An emphasis on Demand Management will help to ensure that water can remain in the environment, unless absolutely needed. Monitoring will help to protect the environment by allowing action from unexpected effects to be taken and will help inform future iterations of the Plan. Overall, it is considered that fWRMP24 represents a well balanced approach, in terms of environmental performance, to providing water to the Portsmouth area.

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