

# **Draft Water Resources Management Plan 2024 Annex 9: Protecting and Enhancing the Environment**

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# Glossary

## Water Resource Zones (WRZs)

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

## Environment scenarios

EP Emerging Plan

**BAU+** business as usual plus. This is based on the Environment Agency BAU scenario (see section 3.3.6) but goes further to include the Uneconomic waterbodies, where reducing abstraction would imply a significant investment (water bodies previously were deemed uneconomic through Restoring Sustainable Abstractions options appraisals). The BAU scenario assumes policy and regulatory approach stays the same with the same level of protection of natural flows (EFI) but the natural flows are adjusted for the impact of climate change on rivers and groundwater and the water bodies are assumed to alter to the impacts of climate.

**Enhanced** the Enhanced scenario provides greater environmental protection for Protected Areas and Sites of Special Scientific Interest (SSSI) rivers and wetlands, principal salmon and Chalk Streams is increased. The most sensitive flow requirements are applied including the Common Standards Monitoring Guidance (CSMG) that sets water quality and quantity targets for designated sites. The natural flows for rivers and groundwater balances are altered for Climate Change. This scenario increases the proportion of natural flow required to protect the environment. The flows and balance test will evolve over the timeframe due to climate impacts.

**Central** Bespoke scenario designed through consultation with Environment Agency. Assumptions as detailed in Section 3.3.8. We developed a pragmatic approach based on emerging outcomes from our current, largely ND WINEP studies, considering known and planned for likely changes to sources. This scenario was originally based on BAU+ addressing our company specific understanding, it included effects like Recent Actual Licence capping, emerging outcomes from WINEP, and outcomes from a review of listed sources to remove non-operational mothballed sources that no longer exist.

**Alternative** Bespoke scenario designed through consultation with Environment Agency. Assumptions as detailed in Section 3.3.8. We developed what we considered to be a best-case scenario in terms of maximising environmental benefit but a reasonable worst-case scenario in terms of future supply deficit. This scenario is based on the approach used in Enhanced that maintains and improves Protected Areas, but this scenario goes further to seek maximum environmental benefit by assuming some of our chalk sources are no longer

viable for abstraction. In effect under this scenario, we proposed to cease abstraction from all sources within River Itchen catchment and would also cease abstraction from our Pulborough source. This scenario was used as a stress test for the system to understand the long-term implications of sustainable abstractions and determine the scale of regional solutions required to address the deficit, such as desalination plants, water reuse schemes and the required increased network for large scale company transfers.

**Others**

1:500	1-in-500 dry year
CSMG targets	Common Standards Monitoring Guidance, flow targets used by Natural England
DO	Deployable Output
EFI –	Environment Flow Indicator
ND –	No Deterioration
RA –	Recent Actual
SSSI –	Site of Special Scientific Interest (Protected Areas)
WRSE –	Water Resources South East - regional water resource group

# 1 Introduction

This annex sets out how we are taking steps to protect and enhance the environment. In the short to medium term we are driving forward our Catchment First strategy to improve water quality and undertake investigations into the impacts of our abstractions.

This annex also sets out our longer term environmental ambition through which we will ensure river flows and Protected Areas meet flow targets and are not negatively impacted by our abstractions so that our water supplies are sustainable.

## 2 Catchment First



**Catchment First** is Southern Water's commitment to put the well-being of the environment at the centre of the decisions we make and the services we deliver. It represents a shift in focus from relying on traditional engineering solutions, to working collaboratively with partners to create long-term sustainable improvements to the environment on which our business and customers depend.

- This shift in approach has been accelerated as a result of two key drivers; the Environment and Our Customers:

### 2.1 Environmental drivers

The need to serve customers under increased water resource pressures, with a growing population; the need to supply customers under a range of future climate change scenarios; the challenge to undertake this whilst not only mitigating our past and present environmental impacts, but also improving the environment in which we operate to help with the current climate and biodiversity crisis. We have strong environmental ambition, commitments and constraints around carbon neutrality, water neutrality, nutrient neutrality, biodiversity net gain, improving designated sites, and a public responsibility to keep our rivers, coasts and landscape healthy for future generations. Our regulators, the Drinking Water Inspectorate (DWI), Ofwat, Natural England and the Environment Agency expect us to have a strong focus on catchment management too. From 2020 to 2025 our catchment management work will help us meet our regulatory requirements by delivering our Water Industry National Environment Programme (WINEP) and DWI Legal Notices. Moving forwards from 2025, the expectation is that we will deliver more catchment and nature based solutions, providing wider benefits for the environment and society.

### 2.2 Customer drivers

Our customers are valuing nature more than ever before. There is an increased awareness of the impact of climate change and the resulting extreme weather events on communities, through flooding and dry weather periods. There has also been an increased appreciation of the natural environment and the role it plays in society's mental and physical wellbeing as a result of the covid-19 pandemic. The priorities identified by customers are:

- Be brilliant at the basics: the here and now, focusing on providing safe, reliable water and wastewater.
- Be proactive and focused on the long term: future-proofing now against the challenges ahead, centred on resilience and infrastructure.
- Be environmentally responsible: leaving the environment better than we found it, respecting and valuing nature in assessing solutions, caring for rivers and beaches.

- Be socially responsible: listening to customers, being accountable and transparent.

Catchment First serves all four of these priorities identified. It recognises that our assets and networks do not operate in isolation from the environment, communities or other network operators.

Understanding the difference between the cost of a solution, and the value that a solution could provide to the environment and society is fundamental to our approach, putting natural and social capital at the front and centre of the way we make decisions.

This is a fundamental shift from WRMP19, at which point the key customer insight was “to protect and improve the environment, doing no harm is the absolute minimum”. Now, at WRMP24, the focus has shifted to “protect and restore the environment and habitats, damage is not tolerated at any level”. Customers want to see us doing better, and we need to do better in order to ensure a sustainable supply into the future.

The key principles underpinning our Catchment First programme are also aligned with our WRMP24 aims and include:

- **Improving Environmental Resilience:** A healthy and resilient environment is fundamental to Southern Water’s ability to supply customers into the future. This goes beyond mitigation of potential impacts and seeks to proactively improve the health of the water environment so that it is then more resilient to natural pressures (such as climate change, droughts, floods) and to man-made pressures from catchment activities (including abstraction, wastewater discharges, farming etc). Alongside ensuring compliance through engineered solutions, we can work in parallel to improve the natural environment to help ensure supply solutions are sustainable longer term. Examples of this include:
  - Engaging with farmers, and others, to reduce catchment sources of nitrate (e.g. nitrate fertilisers or urban uses of fertilisers) and prevent deterioration in the quality of underground sources long term; this would be in parallel to further treatment (or additional blending) to ensure drinking water sources are maintained in the short to medium
  - Engaging with farmers to ensure pesticide and herbicide concentrations in the rivers are maintained at a level that does not overwhelm existing treatment processes, thereby improving the catchment and protecting customer sources.
  - Mapping natural capital assets in the catchment and understanding how they could be improved to solve key water quality issues whilst improving and building habitats, thereby enhancing biodiversity, increasing resilience to floods and droughts and providing increased public value. By embedding natural and social capital into optioneering assessments we are then better recognising the **value** of a solution, rather than just evaluating the cost of a solution. Such Best Value solutions should then be delivered either instead of engineered solutions, or alongside engineered solutions to achieve compliance in the short to medium term and to provide environmental and asset resilience into the future under a changing climate and regulatory landscape.
- **Reduced embedded carbon and emissions:** delivering our net zero plan, incorporating carbon costs into decisions, delivering offsetting over and above reductions.
- **Outcome Focus:** clear targets for Environmental Net Gain (ENG) and Biodiversity Net Gain (BNG). Clear and consistent monitoring to support evidence of environment outcome delivery and to feed into Natural Capital and Environment Social Governance (ESG) reporting.
- **Transparent evidence base:** Developing an integrated monitoring plan for catchments and consistent ways of working.
- **Collaborative Planning & Delivery:** co-identification, co-development, co-funding, and co-delivery of the environmental issues and potential solutions with stakeholders and catchment partners. Working with NGOs to provide the best outcomes for customers and environment.

Our Catchment First programme reflects the environmental and customer priorities, and closely links to key strategic plans, most notably the Drainage and Wastewater Management Plans (DWMPs) and the Water Resources Management Plans (WRMP).

Our key strategic Catchment First projects aligned with WRMP to protect water resources include:

- **Sustainable abstraction and mitigation programme:** understanding the baseline condition of the environment and the potential impacts of our abstractions, and enhancing the waterbodies in which we operate, with a water resources and hydroecology focus. Instream Catchment Resilience Schemes (ICRS) are WRMP24 and WINEP schemes, which are multi-AMP with the AMP7 element being monitoring to establish an ecological baseline within a waterbody where we may be having an impact due to our abstractions. The AMP8 element is to implement targeted instream measures to reduce the write-down in abstraction licence quantity in agreement with the EA. This will need to be consistently developed and integrated into our Environmental Destination Scenarios.
- **Groundwater nitrate reduction programme** – understanding the risk of nutrient concentrations (specifically nitrate) in groundwater sources and the resulting risk to drinking water compliance and source sustainability in the future. Implementing catchment schemes, working with agriculture and other land users, to ensure the resilience of the sources and assets in six key project areas: Hampshire, Worthing, Brighton, North Kent, Thanet North and Thanet South, (Figure 2.2).collectively covering approximately 42 groundwater sources from AMP8 onwards.
- **Surface water catchment resilience programme** – understanding the nature of the river catchments and the risks to raw water quality at key abstractions, working with farmers, agronomists and catchment stakeholders to mitigate upstream water quality pressures whilst providing wider environmental outcomes for example for natural capital, carbon, flooding, soil health and sediment erosion. Key focus areas in AMP7 and into AMP8 are the Western Rother and River Arun catchments in Sussex, the River Beult sub-catchment to the River Medway in Kent, and the Eastern Yar catchment on the Isle of Wight (Figure 2.2).

More detail on these catchment programmes are provided below, including what we've focused on to date, how we propose to expand in the future, and how we will work with local partners to deliver lasting wider benefits.

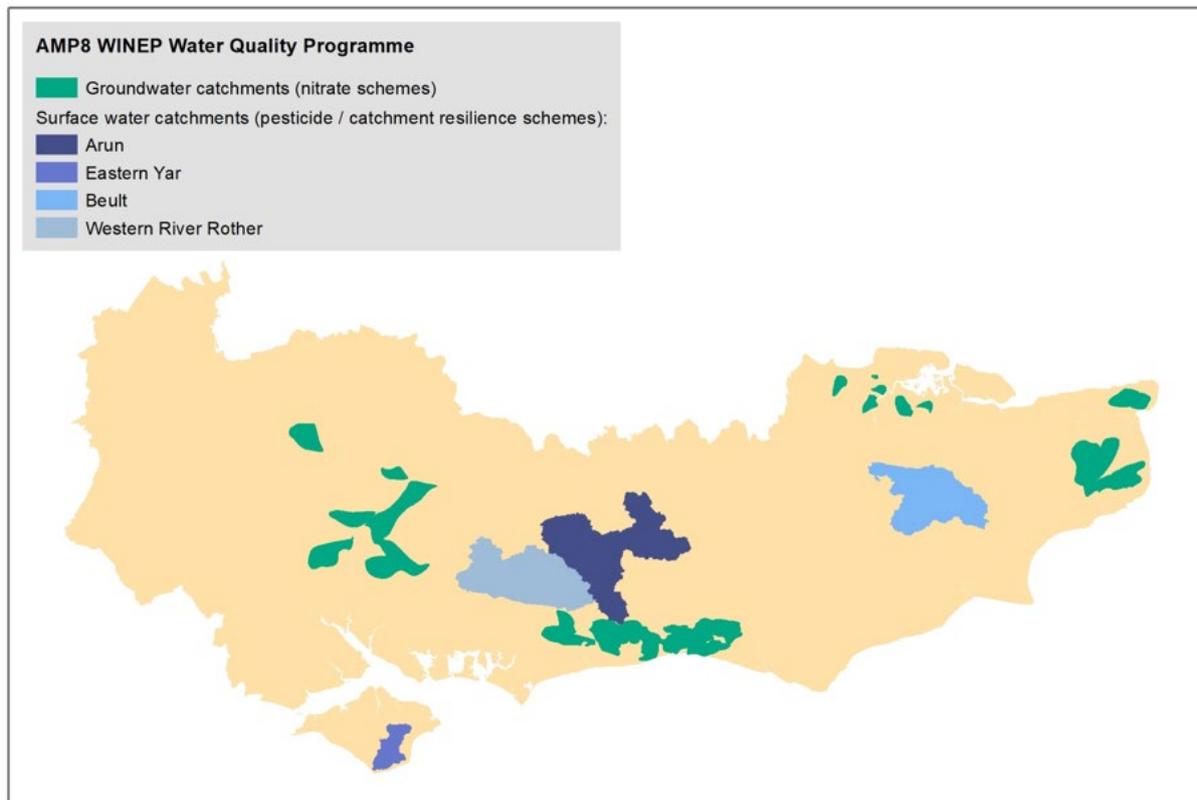
Figure 2.1 Our key Catchment First Projects

# Catchment management

What we're doing to protect catchments across our region



**Figure 2.2 Our key catchments which form part of our Water Quality programmes for surface and groundwater**



## 2.3 Groundwater sources nitrate mitigation projects

For these projects, we are taking a twin track approach to manage water quality alongside treatment (including blending), with a specific focus on agricultural nitrate risk to groundwater sources. In some catchments, catchment programmes run in parallel to the installation of new nitrate removal treatment, and in others it is as an early alternative to treatment, aimed at reducing seasonal peaks of nitrate pollution seen in the raw water monitoring and groundwater models. Overall, our aim is to work in the catchment to reduce nitrate leaching to the aquifer, in an attempt to either delay or negate the need for costly nitrate removal treatment facilities in the future, and to extend the life of existing assets. In doing so, we are working in a more sustainable way, addressing the longer-term underlying causes of groundwater pollution by focusing on crop rotations, soil health and efficient nutrient fertiliser usage, whilst in the short and medium term also ensuring compliant drinking water sources for customers. This approach also enables us to build close relationships to landowners and managers who have significant control over the quality of water we subsequently end up treating, which is critical if we are to prevent pollution, ensure compliance, and deliver lasting outcomes for the environment and society. We are working with a range of delivery partnerships across the groundwater programme, including close working with several farmer clusters across Hampshire, Sussex and the Isle of Wight, engaging directly with farmers, contractors, agronomists and also via larger scale collaborations such as The Aquifer Partnership.

Moving forwards into AMP8, we will be expanding our catchments within the existing groundwater programme and maintaining our focus on engaging farmers and promoting best practice in nutrient management. We will be further enhancing our focus on delivery of wider environmental outcomes for water quality and environment. This includes expanding our mitigation measures to include principles of regenerative agriculture and soil health, carbon sequestration, biodiversity, water efficiency and source resilience. We are also embedding groundwater source protection into the forward plans for the DWMP, ensuring that there is a plan for understanding and mitigating the risk posed to drinking

water sources from our own wastewater assets. The delivery mechanism for the latter sits within the delivery of DWMP.

## 2.4 River catchment sources water quality protection

Similar to the groundwater programme, but in a river catchment setting, we are working with farmers, agronomists and catchment partners to understand the risk from a range of pesticides and herbicides, and undertaking mitigation action via farmer engagement, trials and source control measures. The issue with many agricultural pollutants is that they are highly seasonal; pests are influenced by seasonality, and as such the use of chemicals and subsequently the concentrations of pesticides and herbicides seen in raw water sources are also seasonal. These peaks can be a challenge to treat, especially where multiple pesticides are seen in high concentrations and at the same time of year, driven by seasonal usage and also weather driven run off events. When the turbidity of the river increases (as driven by rainfall) it can become harder to treat water efficiently. This situation is exacerbated with the effects of climate change and widespread decline in soil health. The river catchment programme is therefore vital to ensure that the treatment challenge does not continue to worsen in the future.

We are monitoring for pesticides (along with a range of other pollutants) in the catchments upstream of all our surface water abstractions, analysing the data and engaging with land managers upstream on any pesticide water quality issues as they emerge. This has included on key issues such as metaldehyde risk (from slug pellet use). Alongside this ongoing activity, we are also collaborating with landowners, farmers and other partners in a more focused way in two critical river catchments for water supply – the River Beult (River Medway system in Kent) and the Western River Rother & Arun catchment (in Sussex). Our task is to bring landowners and managers together, share data to contextualise the issues, and work together to find a solution. We are actively engaging on sustainable pesticide use, alternative approaches to weed control, pathway disruption methods, and measures to build soil structure, carbon and infiltration capacity to make soils more resilient to pests and surface water run-off.

Moving forwards, we are further enhancing the pesticide projects with a focus on working with natural capital to make the catchment more resilient. We are taking a natural capital mapping approach to better understand the condition and function of the catchment and its natural assets, and applying methods and tools to target interventions to provide multiple resource benefits whilst making space for nature. This focuses on working closely with catchment partners and landowners to develop pilot projects that will test how we integrate objectives across for example water quality, water resource, natural environment and flooding, to achieve multiple outcomes for society and the environment.

This programme is focused in the Western Rother and Arun, and in the River Beult catchments, and will run in parallel to the pesticide source control projects from AMP7. In combination with engagement, advice and source control, the natural capital resilience approach will help mitigate the impact of climate change, reduce flood risk and improve water quality and resource availability. We will be working with local partners, stakeholders and landowners to implement pilot projects that include habitat enhancement, natural flood management and catchment management approaches to achieve both environmental sustainability and resource resilience.

## 2.5 Water resources river enhancement

As well as undertaking catchment management to protect water quality, we are also undertaking extensive investigations and mitigation activities to help ensure our abstractions, and their impact on the environment (critically chalk streams and associated wetlands), is sustainable. This includes complex environmental monitoring and scenario modelling exercises to understand the potential impacts, and then enhancement work to make the river more resilient. One example of where we are doing this is on the River Anton near Andover, where we are working with catchment partners to deliver river enhancements.

## 2.6 Our key focus for 2023 – 2025

We have made good progress building our catchment first programme so far in AMP7, however more needs to be done. Between 2023 and 2025 our focus is on:

- Delivering our existing WRMP and WINEP AMP7 commitments, including wider roll out of mitigation measures with farmers to reduce nitrate in groundwaters and pesticides in surface waters. We are also continuing our investigations into the impacts of our abstractions on the environment.
- We will be gathering lessons learned to date from our programme trials, moving forwards, focussing on what has worked well, and what has had limited success
- We are improving how we understand and value a healthy, resilient environment as a critical part of the asset base and the potential of our activities in the future to not only better mitigate our impacts but also to also improve environment and public value. This means continuing our natural capital mapping, and our catchment resilience pilots in the River Beult (River Medway) and Western Rother catchments. These projects provide pilots to inform understanding of how to use natural capital to make decisions and provide solutions, and who benefits.
- Continuing from AMP7, we will be further strengthening our partnerships with other delivery organisations such as the Rivers Trust, Wildlife Trusts, farmers and others to help co-develop and co-deliver solutions in the future

We will continue to embed catchment and environment principles into the fundamental building blocks of PR24, so that engineering solutions are considered alongside environmental improvements in our optioneering processes. We are also embedding this theme into our corporate decision-making process.

## 2.7 Catchment First Summary

Our business is rapidly shifting to one focused not just on preventing pollution, achieving compliance, and building our reputation but in addition to this one that puts the customer's views clearly in the frame in decision making. Our customers – including our future customers – support this approach.

As such, catchment is embedded in key strategic plans and delivery mechanisms such as WRSE, WRMP, DWMP. Our evolving Environment Strategy also builds on this by embedding catchment and nature-based solutions across broader business processes.

New government policies strongly reflect the current climate and biodiversity crises. It is also a rapidly evolving landscape in terms of agricultural subsidies, with the focus moving forwards being on “public money for public goods”.

We are already well aligned with these shifts, having developed our catchment strategy and delivery approaches to focus on working in partnerships with agricultural groups, agronomists and directly with farmers in order to mitigate key water quality risks whilst focusing on natural capital and catchment resilience. Our mitigation measures developed have focused on delivering wider benefits such as carbon sequestration, biodiversity and flood resilience, alongside water quality and water resource benefits.

Moving forwards, we are building more on this approach - our catchment resilience pilots developed in 2019/20 have placed us well to know how to use natural capital in best value decision making, how to work with farmers to understand how our soil health programme fits with emerging carbon markets, and how to identify and integrate other funders, including the supply chain, in blended financing approaches. We will be further expanding the catchment resilience approach into the future – an

approach that is not only aligned with our regulatory requirements now via the new WINEP, but is also a more progressive approach to engagement and delivery and one which provides multiple benefits for the environment, the local economy and for social capital.

Key to all this is communication and engagement – with the agricultural sector, with catchment and environment groups, and also with our customers. The Catchment First programme provides fantastic opportunities to help us achieve compliance, prevent pollution and enhance the environment, alongside improving the confidence of our customers and communities, through additional opportunities for education and participation.

### 3 Our Environmental Ambition

Closely linked to our Catchment First programme, particularly the Water Resources Sustainable abstraction and mitigation programme is our longer term environmental ambition to ensure that all of our abstractions from the environment are sustainable and do not cause environmental damage. This is a key aim for us as it will reduce the uncertainty in our longer term plan and enable us to target our investments more efficiently through our adaptive planning approach.

Our water abstraction sources are mainly located within the district of the South East River Basin Management Plan (RBMP) with a few northern sources located within the Thames River Basin District. The RBMP's were first published in 2009 to meet the requirements of the Water Framework Directive (WFD). Through the RBMP process, the current conditions of these areas are assessed, and objectives are set to maintain or improve the conditions of the areas by 2027.

The types of protected areas related to our WRMP24 in the South East RBMP and the Thames RBMP are:

- Drinking Water protected areas
- Recreational Waters (bathing waters)
- Nutrient sensitive areas (Nitrate vulnerable zones)
- Natura 2000 sites: Water dependent SACs SPAs (designated by Natural England)

As well as benefiting from drinking water and nutrient sensitive protected areas, part of our work is to deliver the regulatory actions that are required to avoid the deterioration of Protected Areas and help to meet the targets to maintain (or improve) the quality of these areas. This work is investigated and delivered through our Business Plan and the WINEP.

Within our operational area there are some of the finest examples of chalk streams in the world such as the River Test and River Itchen. These are rare ecosystems that support an abundance of wildlife such as salmon, trout, crayfish, and dragonflies. As part of the Government's 25 Year Environment Plan chalk streams are considered a priority for restoration in addition to those already Protected Areas designated as Natura 2000 sites.

We are continuing to build our understanding of these habitats through environmental studies and investigations to determine the impacts of our water abstraction, the impacts of low river flows and Protected Areas associated with chalk streams. We are working with the EA, Natural England, and other stakeholders such as catchment partnerships to conduct these investigations and implement mitigations which include both abstraction licence changes and physical enhancements that will provide greater protection for the environment. The primary route for this has been through the WINEP under a range of different drivers.

We are investing to help protect chalk streams to ensure we can use sustainable abstractions whilst maintaining public water supplies. In the long-term we plan to return much of the water abstracted back to the high priority chalk stream catchments, such as the iconic chalk streams of the rivers Test and Itchen in West Hampshire through our Water for Life Hampshire programme and RAPID's SRO programme.

## 3.1 Water abstraction plans

The government has set out reforms for the management of water abstraction and these are detailed in the Water Abstraction Plan (WAP) (Department for Environment Food & Rural Affairs, 2021). The plan, in line with RBMPs, seeks to address unsustainable abstractions through three areas: Environment, Catchment Focus and the Abstraction Licensing Service.

Through the WAP the EA has committed to setting out ambitions for ten Priority Catchments which are considered the most challenging catchments in England, along with updating the associated abstraction licensing strategies (ALS). In our operational area the Arun and Western Stream was identified as one of the Priority Catchments and we continue to support work with the EA, WRSE and catchment partners to address unsustainable abstraction in this catchment and inform the ALS. We are currently undertaking a detailed sustainability study at our Pulborough Surface and Groundwater Source including extensive monitoring and modelling to better understand the impacts of our abstraction and implement mitigations if necessary.

Through our own catchment work we continue to engage with catchment partnerships to seek integrated solutions to find the best solutions for bridging the gap between supply and demand. Much of this work is planned, investigated, and delivered through our WINEP projects and Catchment Management Team.

## 3.2 Preventing environmental deterioration

We are committed to ensuring that our abstractions are sustainable and that we address any abstraction licences as required, whilst ensuring we adequately plan for these reductions and for alternative water supplies to be put in place. This helps to ensure we avoid the large deficits and special arrangements that were needed in Hampshire following 2019 licence changes and our Section 20 agreement with the EA.

Since the emergence of the original 'Sustainable Catchments' guidance (Environment Agency, 2016) we have taken a pro-active approach in engaging with the EA to assess the risk of deterioration (in the context of the WFD). We engaged with the EA to agree and produce a screening process to assess the risk of growth and deterioration at all our sources. This resulted in 59 of our abstractions (around 60%) being put forward into our PR19 WINEP for investigation and options appraisal from AMP6 and AMP7 onwards for assessment following the approaches set out in the EA's No Deterioration Guidance (Environment Agency, 2018). Many others were assessed and screened out as they posed no risk of deterioration.

In AMP6 we carried out the first of our No Deterioration (ND) investigations and these resulted in licence changes to three of our sources (see Section 3.5) to protect water bodies against deterioration through a combination of river enhancement and preventing growth in abstraction through licence changes. We have included these licence changes (for Andover, Newport and Lukely Brook) within our baseline supply forecast.

The remainder of our sources were put forward for ND investigations and options appraisal beginning from AMP7 included in our PR19 WINEP and many were mapped across to our PR24 'pre WRMP' information provided to us by the EA in 2021. For PR24 there has been change in how the WINEP will be compiled. Previously it has been the EA who compiled the list of investigations and actions required. However, from Autumn 2022, water companies will develop the WINEP using an integrated catchment approach. Through consultation with regulators and catchment partners we will determine the WINEP for PR24 and beyond.

At the time of preparation of this draft plan the PR24 WINEP is still to be agreed and therefore not incorporated in this draft plan. We have agreed numerous revisions to the PR19 WINEP programme with the EA which we expect to be reflected in the final PR24 WINEP. This includes bringing investigations into many low priority sites forward into our AMP7 and AMP8 programme to efficiently align with other work in those catchments.

Our subsequent proposed WFD ND WINEP programme, and confirmed regulatory completion dates, was based on following EA No Deterioration Guidance (Environment Agency, 2018). Through 2020 we completed assessments required under the guidance to inform the priority classification (Priority A - D) of our WFD investigations and submitted proposed completion dates to address risk of deterioration to the relevant EA teams in November 2020.

These changes in regulatory completion dates relate to several factors:

- Some sources were screened out of the future ND WINEP investigations because there is no risk of abstraction growth and hence no risk of deterioration. Typically, these are sources which are infrastructure-constrained or mothballed and where there are no planned enhancement schemes to abstract more water;
- Risk of abstraction growth and hence deterioration was unlikely before 2030. This is because we expect that implementation of our demand reductions and water efficiency initiatives will drive down consumption in all WRZs. However, later demand increases, primarily driven by population increases might occur in some WRZs after 2030. In these cases, investigation options appraisal and mitigation could be deferred until later in the planning period with associated sources assigned a lower priority (typically Priority C or D); and
- Longer periods of time were required to investigate and gather appropriate hydrological and ecological datasets thus allowing to make evidence-based decisions on the nature of mitigations, including possible future licence changes.

Table 3.1 summarises the number of sources and which we are proposing for our PR24 WINEP with ND associated drivers and their regulatory dates.

In addition to our formal ND investigations and options appraisal we have also recently been through a licence modernisation and rationalisation exercise for many of our groundwater licences, including our group licences in the Sussex and North Kent Chalk. As part of this, we have proposed to remove 14,850MI of unused annual licence headroom. This does not affect DO but does provide a further level of protection in terms of reducing risks of deterioration from abstraction growth in addition to that which will be supported by evidence collected through our ongoing WINEP investigations.

**Table 3.1: Summary of our current and proposed WINEP actions to prevent deterioration under the Water Framework Directive**

WRZ	No. of Sources	No. of Sources with WINEP ND drivers	Regulatory Date(s)	Comment
HAZ	5	0	N/A	<p>ND investigation for Andover completed in 2021. Recent actual licence cap applies from 2027. Additional river enhancement is being implemented.</p> <p>Other sources in WRZ screened out as no risk of growth (asset constrained) and DO is approximately equal to recent actual outputs. These sources do not appear in the PR19/PR24 WINEP.</p>
HKZ	2	1	2025 for investigation (Priority B AMP9 implementation)	<p>Our near Basingstoke source is currently subject to ND investigation.</p> <p>Our Newbury source does not appear in the AMP7 WINEP and is presently asset constrained so risk of growth</p> <p>However, following our screening process we expect abstraction growth will not occur as our demand forecasts show a long-term reduction in demand in this WRZ through delivery of our water efficiency and leakage reduction programmes.</p>
HRZ	2	2	2025 for investigation (Priority C AMP9 implementation)	<p>Both sources in this WRZ have live ND investigations, however our screening assessment suggested only our Romsey source has potential for growth after 2030. Our Kings Sombourne source is capacity constrained and therefore we consider there to be low risk of growth above recent actual rates.</p>
HWZ	3	2	2025	<p>Two sources have live ND investigations alongside other WINEP drivers including habitats directive investigations.</p> <p>Neither source with ND drivers is forecast to have planned abstraction growth due to likely future licence changes arising from other drivers within the Itchen Catchment. We are not currently forecasting ND based reductions for these sources. We proposed to cease our Alresford abstraction in 2030 to meet obligations from other drivers (habitats investigations in the River Candover).</p>

WRZ	No. of Sources	No. of Sources with WINEP ND drivers	Regulatory Date(s)	Comment
				Our Barton Stacey source has been screened out as no risk of growth and does not appear in the AMP7 WINEP.
HSW	1	0	N/A	Licence change which removes risk of deterioration at this source already applied (2019) and our Test Surface Water source has been removed from the WINEP.
HSE	3	1	2024	Source with ND driver is not forecast to have planned abstraction growth due to likely future licence changes arising from other drivers and hence we are not currently forecasting ND based reductions for these sources.
IOW	9	9	2025 (Priority C AMP9 implementation)	<p>Two sources have already completed ND investigations with recent actual licence cap applied. Additional river enhancement is being implemented.</p> <p>Most other sources have been removed from the WINEP because no growth is forecast, sites are mothballed (no DO) or growth is not possible due to other constraints.</p> <p>For one source, which includes flow augmentation we expect this to be removed from the ND risk because of how the site operates to supplement river flows only during periods of low natural flow.</p>
SNZ	9	6	2025 (Priority C AMP9 implementation)	<p>Two sources have growth factors greater than one which relate to proposed supply options from WRMP19 (Petersfield and West Chiltington). Until those investigations conclude we have assumed that the options will deliver in line with WRMP19 forecasts.</p> <p>Other sources have been screened out either because our assessment has shown there is no potential for growth or there are likely to be future licence changes arising from other drivers and hence we are not currently forecasting ND based reductions for these sources.</p>
SWZ	12	12	2027 (Priority C AMP9 implementation)	Our screening assessment has ruled out potential growth before 2030 at all sites; however an investigation to assess potential deterioration risk from growth after 2030 with potential mitigations in AMP9 has been included.

WRZ	No. of Sources	No. of Sources with WINEP ND drivers	Regulatory Date(s)	Comment
SBZ	12	12	2027 (Priority C AMP9 implementation)	<p>Many of these sources were not in the original WINEP provided by the EA but we have chosen to add them and bring forward investigations to align with those in our neighbouring SWZ.</p> <p>Surface water ND risk to Lewes Winterbourne has been addressed through our AMP7 mitigations.</p>
KMW and KME	24	24	2027 (Priority C AMP9 implementation)	<p>We are undertaking a joint ND investigation across both KMW and KME WRZs for completion in 2027.</p> <p>13 sources were identified as having a potential risk of growth after 2030. We expect there to be licence changes but the magnitude is presently highly uncertain. However there is no risk of growth prior to 2030 and hence implementation is likely to be from AMP9. The other 11 sources we propose to screen out from ND as there is no risk of growth due to licence and infrastructure constraints.</p>
KTZ	11	11	2027 (Priority C AMP9 implementation)	<p>Our screening assessment has ruled out potential growth before 2030 at all sites, however an investigation to assess potential deterioration risk from growth after 2030 with potential mitigations in AMP9 has been included.</p>

A key principal of preventing deterioration is the prevention of planned (or unplanned) growth in abstraction which could lead to environmental damage or deterioration in water body status under the Water Framework Directive. The main mechanism by which such damage would be prevented is through imposition of caps upon abstraction licences which would prevent, or limit growth in abstraction by removing licence headroom (the amount of available licence volumes above current rates which is not currently being used).

To address the recent guidance (REF) around the prevention of deterioration we have included the application of licence caps within our environmental destination scenarios. The “recent actual” rates we have used to determine the level of licence capping have been based on our review of abstraction patterns over the past 20 years, including consideration of abstraction patterns through River Basin Management Plan cycles 1, 2 and 3. We have shared these proposed baseline abstraction rates with the Solent and South Downs and Kent, Sussex And South London Environmental Agency Area teams through our ongoing No Deterioration WINEP Investigations.

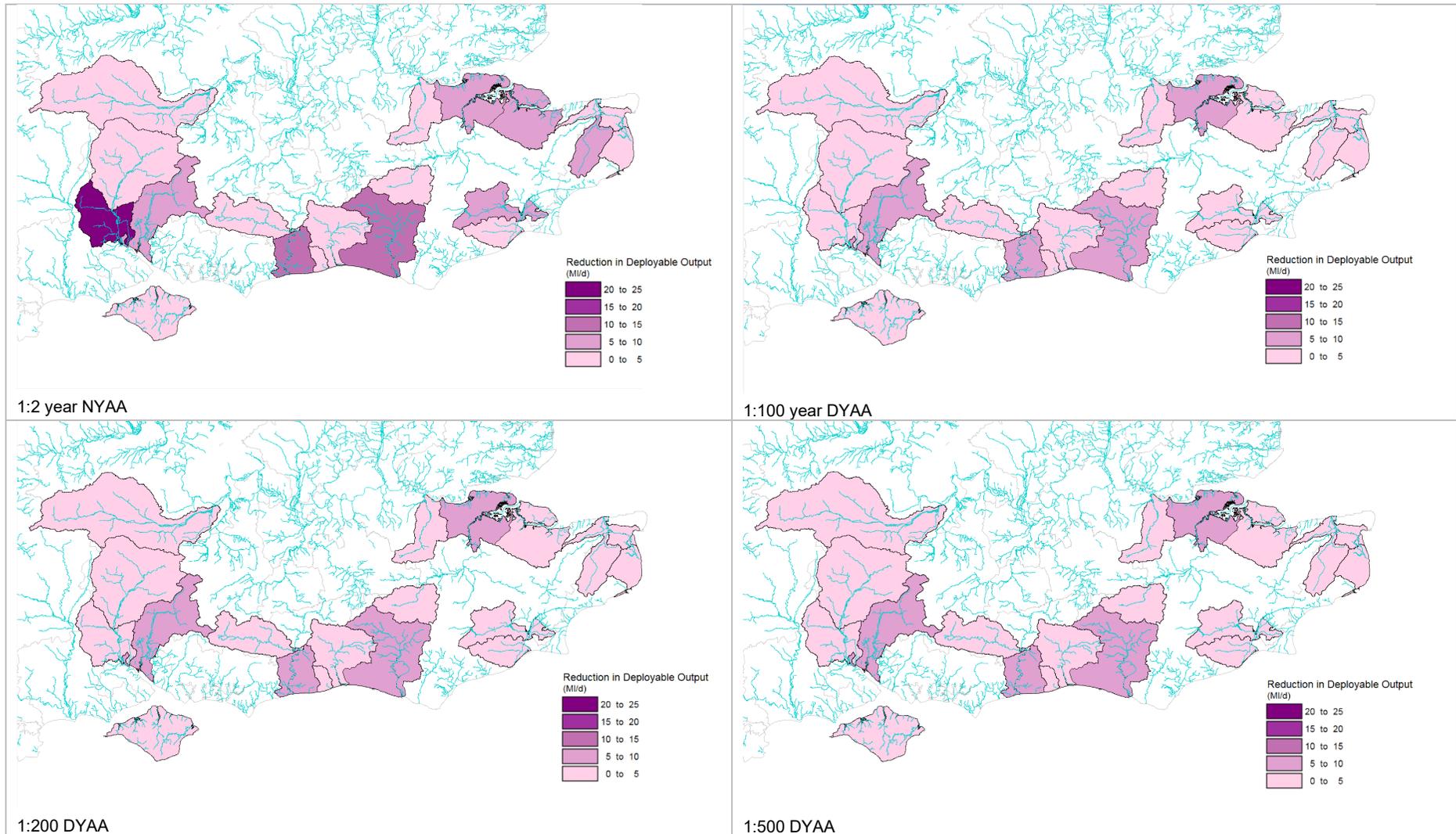
Whilst our No Deterioration WINEP investigations are ongoing and we build an evidence based to support decision making through environmental monitoring and modelling the

Table 3.2 and summarises the potential impacts on deployable output from application of licence capping alone. However, in many cases we may need to go further in terms of licence reductions to reach environmental flow targets.

**Table 3.2 Projected impacts of licence capping on DO, this shows the amount of water we will need to replace if licence caps are imposed based on our assessment of Recent Actual rates through our ongoing 'No Deterioration' investigations.**

WRZ	Projected DO (DYAA) Impact by Return Period (Ml/d)			
	1:2 (NYAA)	1:100	1:200	1:500
HKZ	-3.28	-3.28	-3.28	-3.28
HAZ	-1.40	-1.40	-1.40	-1.40
HRZ	-3.45	-3.45	-3.45	-3.45
HWZ	-6.51	-6.51	-6.51	-6.51
HSE	0.00	0.00	0.00	0.00
HSW	-20.84	0.00	0.00	0.00
IOW	-1.27	-1.27	-1.20	-0.86
SNZ	-8.15	-7.15	-5.55	-5.55
SBZ	-12.22	-6.85	-6.68	-6.38
SWZ	-9.58	-7.98	-7.91	-7.86
KME	-12.55	-9.28	-9.18	-8.97
KMW	-3.88	-3.42	-3.37	-3.31
KTZ	-13.83	-4.67	-4.54	-4.54
SHZ	-12.48	-3.04	-2.29	-1.56
Western Area	-36.75	-15.91	-15.84	-15.50
Central Area	-29.95	-21.98	-20.14	-19.79
Eastern Area	-42.75	-20.41	-19.38	-18.38
Total for each return period.	-109.45	-58.30	-55.36	-53.68

Figure 3.1 Impact of Licence Capping on Deployable Output by Return Period and EA Operational Catchment



### 3.3 Time Limited Licences

The supplementary guidance on preventing deterioration (Environment Agency, 2022) requires us to consider that Recent Actual Licence capping may be applied to any time-limited licences on renewal in the first instance and that there may be risks of non-renewal. Key information on our time-limited licences is shown in Table 3.3.

Natural England has expressed concerns about impacts on the Arun Valley designated sites and features relative to our application to renew our River Arun abstraction licence on its existing terms. The licence expired on 31 March 2022, but the EA has given us permission to continue abstracting pending their determination of our application, submitted in December 2021. Any additional constraint will further stress the SNZ supply-demand balance.

**Table 3.3 Summary of Time Limited licences considered in our Environmental Ambition**

Source(s)	WRZ	Operational Catchment	Expiry Date	Relevant Studies and likely outcome
Itchen GW	HSE	Itchen	31/03/2025	Licence reductions applied in 2019. Under investigation for several WINEP drivers including Habitats directive, SSSI investigations.
Itchen SW	HSE	Itchen	31/03/2025	
Twyford	HSE	Itchen	31/03/2025	Investigations will conclude in March 2024 to inform renewal, but options appraisal will occur in AMP8. Renewal currently expected but future licence changes following WINEP studies are likely and considered in our Environmental Ambition scenarios.
Test Surface Water	HSW	Lower Test and Southampton Streams	31/12/2027	Licence reductions, including consideration of deterioration risk were applied in 2019, additional conditions on licence will apply from 2027 further restricting use and preventing deterioration. We do not currently expect to face further licence reductions unless CSMG* flow standards are applied (under current WINEP investigation). Licence has been screened out of WINEP. No Deterioration risk and has no DO, except in normal years.
River Arun	SNZ	Lower Arun		Application submitted December 2021. We have leave to continue using it after this date until the licence application (submitted Dec 21) is determined. We expect licence renewal to be time limited to 2030.
Robertsbridge (Darwell Reservoir)	SHZ	Rother Levels	01/04/2025	This operational catchment is currently not flagged as high priority and was not considered as requiring licence reduction in EA Environmental Destination review. There are no active WINEP investigations, and we expect licence to be renewed.
River Medway	KMW	Lower Medway	31/12/2025	No are no active investigations, we expect licence renewal to be time limited.

\*CSMG = Common Standards Monitoring Guidance

## 3.4 Other environmental drivers

In setting our Environmental Ambition we have also considered other environmental drivers, some of these are formally linked to other Water Resource WINEP drivers (Table 3.44) or more general areas where we will seek to make environmental improvements.

The three specific licence change risks most explicit in our new plan preparations are those to our Totford groundwater licence, River Itchen licences (River Itchen WSW surface water and groundwater and Twyford groundwater) and our Pulborough groundwater licence.

These Alresford and River Itchen investigations primarily relate to our AMP7 WINEP investigations on the River Itchen. These include modelling and monitoring studies to assess abstraction impacts on the SAC and SSSI designated sites. This includes an assessment of the potential implications of Natural England's Common Standards Monitoring Guidance (CSMG).

The Pulborough concerns arising more specifically from Natural England's (NE) assertion that our abstraction within the existing groundwater licence could be damaging the features of neighbouring designated sites of the Arun Valley. We have agreed with the EA and NE that this assertion will be considered within a full sustainability assessment of the existing licence, to be completed by April 2025. A monitoring programme is underway to gather data for an evidence-based assessment using an enhanced groundwater model and, we have implemented 'best endeavours' minimisation of groundwater abstraction since November 2021. In parallel to these investigations, we have committed to support the Local Planning Authorities achieve Water Neutrality in our Sussex North Water Resource Zone for new developments. Further details are provided in Section 3 of dWRMP technical report.

Table 3.4: Other Environmental Investigations and Drivers reflected in our Ambition

WRZ	Source(s)	Regulatory Drivers	Comments
HWZ	Alresford Winchester	Habitats Directive and SSSI investigations including assessment of CSMG flow standards	Emerging outcome of our studies of the Candover Stream is that our Alresford source will need to stop operation and we currently assume this will occur in 2030 with interim mitigation and river enhancement.  Implications for our Winchester source are presently uncertain but are primarily thought to relate to Habitats Directive and SSSI investigations rather than the CSMG flow standards which are potentially compliant on the affected reach.
HSE	Twyford Itchen SW Itchen GW	Habitats Directive and SSSI investigations including assessment of CSMG flow standards	Even though licences were recently changed (2019) and would prevent deterioration we expect that future licence reductions will be required to meet existing EFI flow standards and as mitigation for Habitats Directive and SSSI investigations.  Licence changes could potentially go further if CSMG flow standards are applied.  There is a high risk of DO losses in this WRZ.
HSW	River Test SW	SSSI investigations including assessment of CSMG flow standards	Further licence change is already confirmed for 2027.  Licence changes could potentially go further if CSMG flow standards are applied.  HSW already has no DO under drought conditions. CSMG standards would reduce normal year DO.
SNZ	Pulborough GW Pulborough SW	Pulborough Sustainability Study	Non WINEP driven sustainability study including habitats assessment to examine the impact of our Pulborough groundwater source on nearby SSSI Wetlands by 2025. This project will also include No Deterioration assessments and mitigations.

### 3.5 Confirmed licence changes

We have included confirmed abstraction licence changes, also referred to as sustainability reductions where licence changes have already been agreed with the EA following our AMP6 WINEP investigations and the 2019 changes to our Test and Itchen licences. A summary of these confirmed reductions included in our baseline supply forecast is provided below.

- Our 2019 licence change to the River Test surface water abstraction included a condition which adjusted Hands-off Flow conditions (HoF), adding further conditions, which vary seasonally on the channel of the Great Test.
- A licence reduction and new monthly quantities for our HAZ Andover source which would be implemented from 2027. However, a larger reduction, which would restore river flows to EFI standards were screened out of the RSA investigation on cost benefit grounds. This additional reduction is considered further in our Environmental Ambition scenarios.
- A licence reduction and new monthly quantities for our IOW Newport and Lukely Brook sources. These changes provide protection against deterioration in water body status by providing a cap on abstraction output. However, a larger reduction, which would restore river flows to EFI standards were screened out of the RSA investigation on cost benefit grounds. This additional reduction is considered further in our Environmental Ambition scenarios.

Presently we have no other confirmed sustainability reductions or licence changes and all other uncertain licence changes in the longer term have been included within our Environmental Ambition Scenarios (Section 3.9)

### 3.6 Context for developing our Environmental Ambition

To understand the long-term overall scale of regional environmental needs for additional water by 2050 the EA undertook an assessment based on the high level of drought resilience (1:500 drought), as determined by the Government objective, and a high level of environmental protection greater than in current water company plans. For each of the five regions the EA made an assessment for amount of water required by 2050, and a combination of potential savings of water from demand savings, infrastructure projects and drought actions. The EA also assessed where there might be surplus water at the regional level that could be assessed and investigated for potential future use by other regions.

Using information available from previous WRMPs, the EA modelled the water needs, from 2025, to determine the volume of water required to address unsustainable abstractions that impact the health/condition of water bodies.

The EA developed four policy based scenarios to determine how to achieve long-term sustainable abstraction and to refine the understanding of the scale of reductions to abstractions required to protect the environment and meet public water supplies by 2050. The EA scenarios were:

- **Business As Usual (BAU):** This scenario assumes policy and regulatory approach stays the same with the same level of protection of natural flows (EFI) but the natural flows are adjusted for the impact of climate change on rivers and groundwater and the water bodies are assumed to alter to the impacts of climate. This scenario initially discarded licence changes in water bodies, which were previously determined to be uneconomic through cost-benefit assessments as part of WINEP RSA option appraisals.
- **Enhanced:** This scenario provides greater environmental protection for Protected Areas and SSSI rivers and wetlands, principal salmon and chalk streams. The most sensitive flow requirements are applied including the CSMG that sets water quality and quantity targets for designated sites. The natural flows for rivers and groundwater balances are altered for climate change. This scenario increases the proportion of natural flow required to protect the environment. The flows and balance test will evolve over the timeframe due to climate impacts.
- **Adapt:** This scenario allows for future policy change given that not all environmental objectives can be achieved in a shifting climate. It allows flexibility on the level of protection that can be achieved for less sensitive or modified water bodies allowing continuation of planned water abstraction. It also allows for evolving and adapting river flow and groundwater balance for climate change.

- **Combined:** Includes all of the above. Greater sensitivity for Protected Areas etc. but with a view that good status cannot be achieved everywhere (with shifting climate) and requires more detail to understand how best to protect the environment.

The EA carried out an impact assessment of these potential policies, which assumed water companies licence changes planned between 2020 and 2025 had already occurred. The forecasts include the impact of climate change on natural flows by 2050 and future predicted abstractions reflecting planned patterns of demand were also used. The EA forecasts indicated a considerable amount of additional water for the environment is required (about 880Ml/d nationally) to meet EA targets by 2027 (based on recent actuals). This approach has limitations for the proposed regional planning approach as it was based on information gained through WINEP, which is relatively short term (5-10 years) term, and it excludes other water sector abstractors. The EA modelling also assumed a relatively severe climate change scenario.

This national assessment does not represent the actual changes required to licence. This must be based on local information, and regional or catchment scale investigation and modelling. Only a single approach was used to model the impact of climate change, a range of climate change scenarios will be required to assessment potential impact on the environment. Other approaches to managing abstraction rates other than licence reductions can be used, such as management of reservoir storage and flow releases.

### 3.7 Developing Our Environmental Ambition scenarios

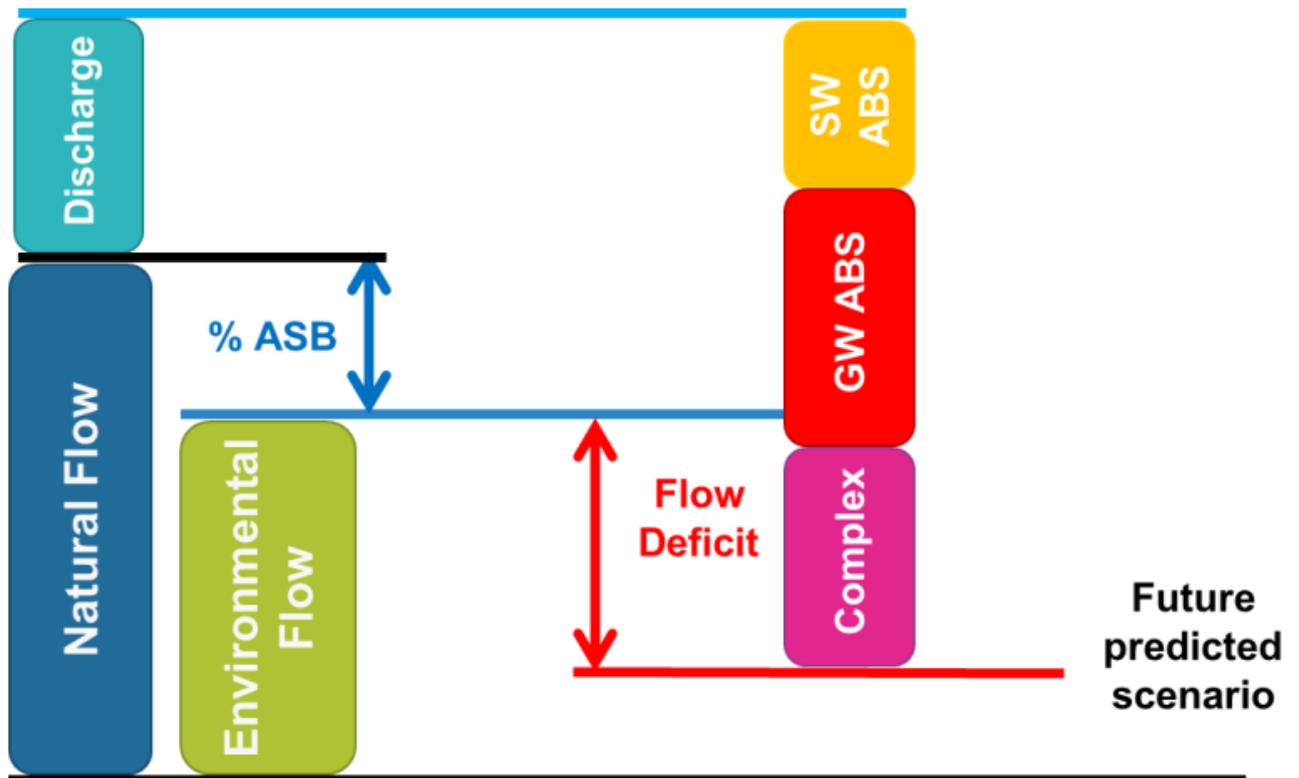
Taking on board current guidance, policy, the emerging outcomes of our WINEP studies and our environmental ambitions we have been involved in developing regional plans as part of the WRSE group and we have worked with the EA to develop four Environmental Ambition scenarios. These scenarios are based on local knowledge and our own understanding of the environment and in consultation with the EA at both a regional and local levels.

At a regional (WRSE) level, to work collaboratively on the regional resilience plan and our own Environmental Ambition, additional scenarios have been developed that represent the range of environmental ambition for the region:

- **BAU+** based on the EA BAU scenario but goes further to include the uneconomic water bodies (those water bodies identified by RSA options appraisal cost-benefit assessments), where reducing abstraction would imply a significant investment.
- **Enhanced** which is the same as the original EA Enhanced scenario

To derive the DO and licence impacts for these scenarios, future predicted abstractions and licence quantities were compared to environmental flow targets using impact factors contained within the Environment Agencies Catchment Abstraction Management System (CAMS) ledgers. The degree of licence reduction was determined by the amount of abstraction required to achieve EFI and/or CSMG flow targets in water bodies affected by that abstraction, based on the abstraction sensitivity band (ASB). The process for the development of these scenarios is described fully in the WRSE

Environmental Ambition Technical Note<sup>1</sup> (WRSE, 2022a), and the accompanying WRSE Method Statement<sup>2</sup>, both are included in Appendix A.



Source: Mott MacDonald

Figure 3.2 Derivation of the reductions required for the BAU+ and Enhanced scenario. The predicted volume for future Natural Flow and Discharge in each water body were compared with the future predicted abstractions for Surface Water (SW ABS), Groundwater (GW ABS) and Complex factors such as reservoir releases and augmentation. The difference between that volume and the required Environmental Flow, based on the abstraction sensitivity band (ASB), described the Flow Deficit that needed to be recovered through licence and abstraction reductions.<sup>3</sup>

While developing the investment modelling to support the Emerging Regional Plan, the WRSE identified that there were large supply-demand deficits being introduced in our Central Area, partly

<sup>1</sup> WRSE, 2022, Environmental Ambition Technical Note, Version D, 100412624-011-SSTNB-01D

<sup>2</sup> WRSE, 2022, Method Statement: Environmental Ambition, Post-consultation version January 2022

<sup>3</sup> WRSE, 2022, Environmental Ambition Technical Note, Version D, 100412624-011-SSTNB-01D

because of meeting the Environmental Ambition Scenarios (under BAU+ and Enhanced) as set out by WRSE assessments. At this stage we undertook a further review of the BAU+ and Enhanced scenario for our SBZ and SWZ WRZs.

We had previously raised concerns with the EA that we considered an EFI based reduction was not appropriate in our wholly groundwater dominated SBZ and SWZ WRZs because a large number of sources do not have significant impacts on surface water bodies (especially within the Brighton urban area) and large reductions in licence were being driven by 'relief channel' impacts, which are used by the EA to represent different hydrological and hydrological settings in water bodies but are not necessarily appropriate for determining flow based targets. In autumn 2021 we agreed with the EA that EFI based targets should not be used for these groundwater bodies and instead we would consider other WFD groundwater body tests.

We also identified that the initial supply-demand balance modelling for the BAU+ and Enhanced scenarios had erroneously been applying proposed reductions from 'future predicted' abstraction as DO impacts, rather reductions relative to baseline DO. This was found to be having the following effects:

- Where future predicted abstraction was less than DO, the required DO reduction to meet flow targets was being underestimated as the flow deficit difference was assumed to be smaller than necessary to meet flow targets.
- Where future predicted abstraction was greater than DO the required DO reduction to meet flow targets was being overestimated as the flow deficit difference was assumed to be greater than required to meet flow targets.

We subsequently revised the original BAU+ and Enhanced scenario as presented in the Emerging Regional plan following these findings and proposed an updated set of reductions under both scenarios to the EA based on the following principles:

- We corrected all reductions to be relative to variable DO, rather than future predicted abstraction so that the reductions were not over or underestimated and correctly accounted for changes in DO at different drought severity.
- We kept EFI based targets for all abstractions affecting non 'relief channel' Surface Water Bodies in our Central Area, for example the Lewes Winterbourne.
- We applied licence capping at our proposed 'recent actual' rates arising from our AMP6 and AMP7 WINEP ND studies.
- For the Enhanced Scenario we also capped licences at 'future predicted' (or EFI for Lewes Winterbourne) rates, recognising this is a further 33MI/d reduction from current recent actual.

For Southern Water the required licence and abstraction reductions determined by WRSE under each of the combined WRSE and EA scenarios are presented in Table 3.5

**Table 3.5: Summary of licence and abstraction reductions (in MI/d) required to meet flow and Environmental targets for each scenario as determined by WRSE<sup>4</sup>**

Scenario	Baseline (MI/d)	BAU – policy & regulatory approach stays the same (MI/d)	Adapt – allows for flexibility with future policy changes and evolution of water body flows from climate change (MI/d)	BAU+ - as BAU but includes uneconomic water bodies (MI/d)	Combine – includes BAU, Enhanced & Adapt but allows for future changes in water body status targets (MI/d)	Enhanced – greatest protection for Protected Areas & chalk streams with most sensitive flow targets (CSMG) (MI/d)
Licence	1179	-320	-640	-645	-695	-698
Future abstraction	578	-78	-176	-181	-210	-213

### 3.7.1 Our Additional Environmental Ambition scenarios

In addition to the BAU+ and Enhanced scenarios, which were based wholly or in part on the original EA Scenarios, we also considered two further scenarios originally referred to in the WRSE Emerging Regional Plan as our ‘Central’ and ‘Alternative’ Scenarios. We designed these scenarios through consultation and local refinement with the EA and are based on the following assumptions:

- Correction of all reductions to be relative to baseline DO for appropriate consideration in supply demand balance modelling rather than relative to future predicted abstraction.
- Included the latest progress and emerging outcomes from our live WINEP water resource studies.
- Our ‘No Deterioration’ baseline abstraction assessment from our AMP6/AMP7 ND studies (to include effects of licence capping to prevent deterioration).
- Our understanding of environmental impacts from previous modelling and observational studies.
- Discussions with local Area EA staff.

For our **‘Central Scenario’** we developed a pragmatic approach based on emerging outcomes from our current, largely ND WINEP studies, considering known and planned for likely changes to sources. This scenario was originally based on BAU+ addressing our company specific understanding, it included effects like Recent Actual Licence capping, emerging outcomes from WINEP, and outcomes from a review of listed sources to remove non-operational mothballed sources that no longer exist.

For our **‘Alternative Scenario’** we developed what we considered to be a best-case scenario in terms of maximising environmental benefit but a reasonable worst-case scenario in terms of future supply deficit. This scenario is based on the approach used in Enhanced that maintains and improves Protected Areas, but this scenario goes further to seek maximum environmental benefit by assuming some of our chalk sources are no longer viable for abstraction. In effect under this scenario, we proposed to cease abstraction from all sources within River Itchen catchment and would also cease abstraction from our Pulborough source. This scenario was used as a stress test for the system to understand the long-term implications of sustainable abstractions and determine the scale of regional

solutions required to address the deficit, such as desalination plants, water reuse schemes and the required increased network for large scale company transfers.

Appendix B summarises our development of our “Central” and “Alternative” Scenarios.

### 3.7.2 Summary

A full breakdown of our proposed reductions under both our Central and Alternative Scenarios is provided in Section 5 and is summarised at a WRZ level in Table 3.6.

The proposed DO reductions (for a 1 in 500 return period) drought under our ambition scenarios therefore go much further than those required under a licence capping scenario to prevent deterioration under all scenarios (Section 3.2) and so will not only prevent deterioration but aim to actively deliver flow and water balance improvements, especially for the chalk groundwater dominated catchments in our WRZs.

Where WRZs show similar or identical reductions across scenarios, this is either because the policy decisions align or where our best available information for our local scenarios (Central and Alternative) is not yet robust enough to justify a departure from BAU+ and/or Enhanced. This is particularly the case in our eastern WARZs where we are still undertaking a large number of WINEP investigations to understand our abstraction impacts and until those investigations conclude we do not have sufficient evidence to suggest alternative reductions or flow targets. Generally we have greater confidence in the volumes required for our Central and Western Areas as there has been a longer history of investigation and impact assessment through mature groundwater modelling developed over a number of AMP cycles (e.g. through RSA, Habitats Direction or No Deterioration investigations).

Table 3.6: Summary of abstraction reductions proposed in our four Environmental Ambition Scenarios.

WRZ	Licences	WINEP ND Recent Actual	Future Predicted	Reduction in DYAA Deployable Output (1 in 500 Drought) (Ml/d) by 2050			
				BAU+	Enhanced	Central	Alternative
HKZ	8.70	5.40	1.12	-4.63	-4.63	-4.16	-4.16
HAZ	25.51	18.44	14.55	-8.59	-8.59	-9.38	-12.52
HRZ	18.68	6.90	6.14	-3.45	-3.45	-3.45	-3.45
HWZ	23.85	17.32	16.44	-6.68	-6.68	-12.80	-22.71
HSE**	118.02	80.00	61.21	0.00	0.00	0.00	-20.49
HSW	80.00	52.70	52.56	0.00	0.00	0.00	0.00
IOW	57.23	24.30	25.78	-10.25	-11.02	-8.06	-14.25
SNZ	121.00	79.70	63.75	-6.41	-6.8	-6.76	-8.23
SBZ*	111.25	89.00	68.93	-25.27	-39.44	-6.48	-20.99
SWZ*	64.67	50.40	37.69	-7.86	-17.87	-7.86	-19.72
KME	88.73	74.44	54.84	-48.14	-48.51	-20.27	-48.51
KMW	297.27	102.36	104.64	-20.63	-22.42	-3.31	-22.70
KTZ	94.57	45.50	40.06	-23.01	-29.56	-11.94	-29.56
SHZ	59.08	24.25	24.54	-1.56	-1.56	-1.56	-1.56
Western Total	331.99	205.06	177.8	-33.6	-34.37	-37.85	-77.58
Central Total	296.92	219.1	170.37	-39.54	-64.11	-21.1	-48.94
Eastern Total	539.65	246.55	224.08	-93.34	-102.05	-37.08	-102.33
Total	1168.56	670.71	572.25	-166.48	-200.53	-96.03	-228.85

## 3.8 How do our reductions change with time?

To ensure that we are taking appropriate action when required first we have prioritised our licence reductions based on environmental need and likely delivery timelines from our current WINEP programme. In designing these profiles, we have assumed the following:

- Our Central scenario River Itchen catchment reductions occur between 2030 to 2035 as a linear profile reflecting AMP9 delivery following resolution of our AMP6/7 WINEP studies.
- For the additional River Itchen reductions in the Alternative scenario up to and including cessation of abstraction we have assumed this applies as a linear profile over and above the Central scenario with the final destination being achieved by 2050.
- A step change (licence revocation) is applied to our River Medway source in 2030 in line with expected WINEP outcome in 2030.
- To reflect our current ND WINEP drivers the vast majority of which conclude in 2027 we have assumed implementation of licence caps from AMP9 via phased reductions between 2030 and 2050. This applies to our SWZ, KMW, KME, KTZ, HRZ and HKZ WRZs.
- For later WINEP ND studies (e.g. Brighton Chalk) we have assumed AMP10 implementation of licence changes between 2035 and 2050.
- Any reductions in our Alternative scenario over and above our Central scenario occur as a linear profile out to 2050 once the Central scenario has been achieved.
- For any non WINEP reductions, for example changes to Andover, a linear profile is assumed to 2050.

### 3.8.1 Prioritising Abstraction Reduction

Our ongoing WINEP investigations have provided us a degree of relative certainty about the magnitude of reductions in abstraction that are likely to be required. However much more uncertainty exists regarding the required timing of licence changes, both to meet Environmental Flow Targets and as necessary to prevent deterioration.

To mitigate this uncertainty, we have applied a prioritisation approach to help us act sooner in those catchments where there is a greater degree of certainty of the benefits of restoring flows and where the impacts are greatest. A semi-quantitative set of screening principals was initially developed by WRSE Environmental Advisory Group (EAG). The EA took principles agreed by the EAG to propose a semi-quantitative assessment of prioritisation we was subsequently agreed and endorsed by the EAG<sup>4</sup>. which we have applied, at a WFD water body scale, to each of our abstraction sources.

Our prioritisation approach,<sup>5</sup> illustrated in Table 3.7, sets out to achieve the following:

- Weighted towards the most vulnerable catchments, for example those with protected sites or chalk streams.
- Favour reductions where the benefits will be greatest, for example in headwater catchments or where flow impacts will be greatest or more certain.
- Prioritise catchments with public amenity benefits using population within the catchment as a proxy. Note that for catchments where there is only a groundwater benefit, for example parts

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<sup>4</sup> Environment Agency 2021, EAG Feedback on Prioritisation Ideas, WRSE EAG meeting 18-10-21

<sup>5</sup> Environment Agency 2021, EAG Feedback on Prioritisation Ideas, WRSE EAG meeting 18-10-21

of the Brighton Chalk block we have assumed there would not be a benefit to people as these changes would not be visible.

Aim	Proposed Prioritisation Method	Score	
<b>Highest ecological potential</b>	Protected area (SSSI etc)	Present in catchment	+2
	BAP (e.g. Chalk Stream)		
	Flagship chalk stream		
<b>Maximise Benefit</b>	Upstream first (prioritise headwaters over downstream water bodies)	Headwaters	+2
<b>Certainty of benefit (to flow and ecology)</b>	Scored using available evidence and knowledge of each catchment.	High	+2
	EA technical teams to propose scores taking into account: <ul style="list-style-type: none"> <li>Level of certainty that reducing abstraction results in improved flow.</li> <li>Significance of other issues in the catchment which may limit ecological improvements in the short-medium term (e.g. water quality and modified habitat)</li> </ul>	Medium	+1
		Low	+0
<b>Scale of issue</b>	% below EFI Measure of whether current average low flows (Q95) are meeting the standard flow target (EFI).	25% below EFI	+2
	Option to use Abstraction as a % of Recharge as an alternative for some catchments (e.g. where a discharge masks the scale of the issue using the EFI method)	Below EFI	+1
<b>Benefit to people</b>	Population in catchment (rank catchments - top third are assigned High, middle third assigned Medium, bottom third assigned Low)	High	+2
		Medium	+1
		Low	+0

**Table 3.7: Our Environmental Ambition Prioritisation Approach based on methodology proposed by the EA (Environment Agency, 2021c)**

The results of our prioritisation approach were shared with the EA and our assessment broadly aligns with an independent assessment conducted by the EA which followed similar principals - although their assessment did not include scores allocated for Protected Areas or benefit to people.

WRSE further developed the prioritisation approach including additional metrics on population, accessibility (in relation to tangible benefits of reductions) and protected areas through consideration of drinking water protected areas and Natural England Recovery List of sites.

A comparison of all three prioritisation assessments is presented in Table 3.8.

If the relative differences in scoring are converted to rankings, the three assessments broadly agree and for us place particular focus on the catchments of the River Itchen, River Test, River Arun and Isle of Wight Streams.

There are also a few catchments where we have suggested revisions are required for the WRSE prioritisation scores for our sources.

- There was no Chalk Stream Score for the Isle of Wight rivers which we believe is incorrect as there are several headwater streams (e.g. Lukely Brook, Caul Bourne) within that operational catchment, although the geology is quite mixed.
- Similarly there is no Chalk Stream score for the White Drain and Lakes, Teville Stream and Lower Arun catchments all of which have Chalk groundwater inputs (but streams then also flow over younger strata).
- Our assessment scores (and therefore rank) the Darent and Kennet a little lower than , falling into our middle band but this is probably as our flow impacts on both are to more limited

reaches compared to other WRSE companies (we've only one source in each catchment) and so we have not assessed impacts across the entire catchment, for example, we have no abstractions which impact on the River Darent Headwaters as this falls outside our supply area.

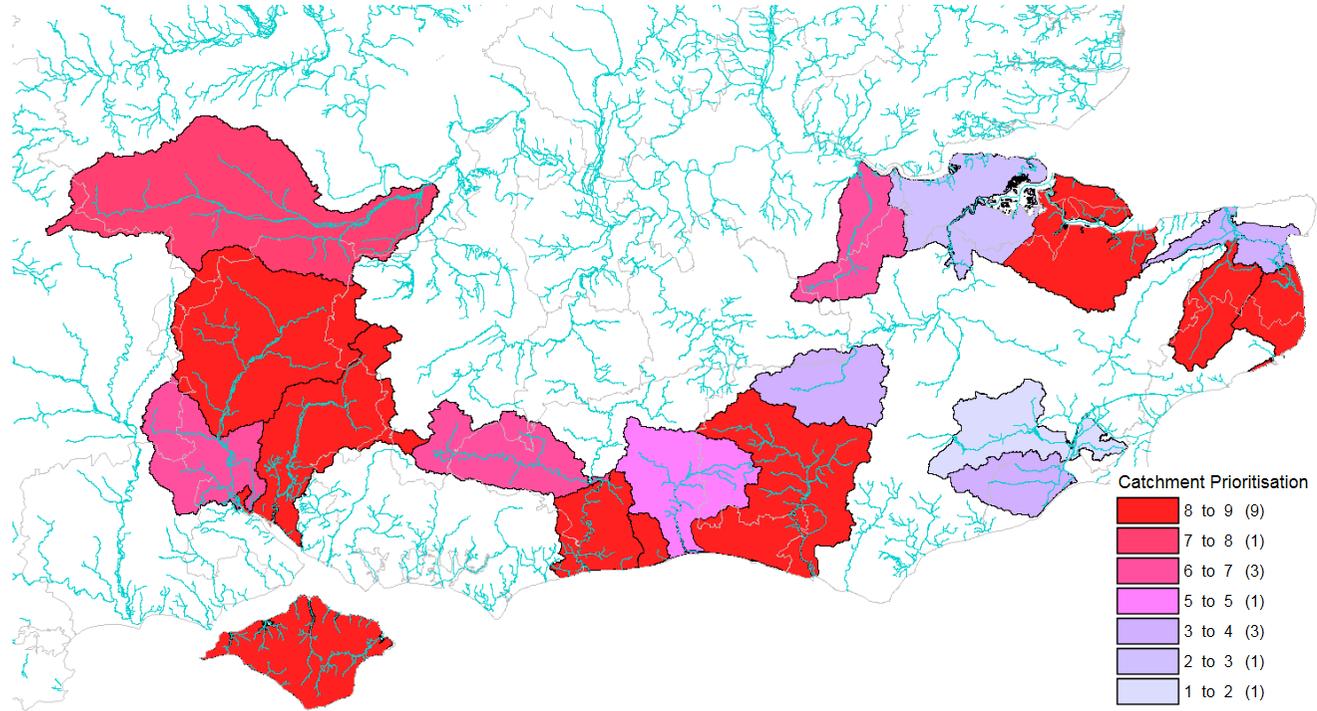
**Table 3.8 Summary of the prioritisation score for WRZs compares between the EA priority score ( which excluded Protected Areas and Population) and the draft Southern Water priority score. The suggested horizon for reductions in the medium and long-term**

Operational Catchment	EA Prioritisation Score (Max 6) [Rank]*	WRSe Prioritisation Score (Max 15) [Rank]**	Our Prioritisation Score (Max 9) [Rank]	Our Proposed Suggested Horizon for Reductions
Isle of Wight Rivers	5 [Rank 3]	9 [Rank 1]	10 [Rank 8]	High Priority (2040)
Upper and Middle Test	3 [Rank 13]	9 [Rank 1]	12 [Rank 4]	High Priority (2040)
Upper Ouse	5 [Rank 3]	9 [Rank 1]	12 [Rank 4]	High Priority (2040)
Teville	5 [Rank 3]	9 [Rank 1]	8 [Rank 12]	High Priority (2040)
Lower Arun	6 [Rank 1]	9 [Rank 1]	12 [Rank 4]	High Priority (2040)
Itchen	6 [Rank 1]	8 [Rank 6]	15 [Rank 1]	High Priority (2040)
Little Stour and Near Canterbury	4 [Rank 10]	8 [Rank 6]	9 [Rank 10]	High Priority (2040)
White Drain and Lakes	5 [Rank 3]	8 [Rank 6]	9 [Rank 10]	High Priority (2040)
North and South Streams	4 [Rank 10]	8 [Rank 6]	8 [Rank 12]	High Priority (2040)
Kennet	5 [Rank 3]	7 [Rank 10]	14 [Rank 2]	Medium Priority (2045)
Lower Test and Southampton Streams	3 [Rank 13]	6 [Rank 11]	11 [Rank 7]	Medium Priority (2045)
Western Rother	3 [Rank 13]	6 [Rank 11]	7 [Rank 14]	Medium Priority (2045)
Darent	5 [Rank 3]	6 [Rank 11]	13 [Rank 3]	Medium Priority (2045)
Upper Adur	5 [Rank 3]	5 [Rank 14]	10 [Rank 8]	Medium Priority (2045)
Upper Medway	1 [Rank 17]	3 [Rank 15]	6 [Rank 17]	Low Priority (2050)
Stour Marshes	0 [Rank 19]	3 [Rank 15]	5 [Rank 18]	Low Priority (2050)
Brede and Tillingham	4 [Rank 10]	3 [Rank 15]	7 [Rank 14]	Low Priority (2050)
Lower Medway	0 [Rank 19]	2 [Rank 18]	7 [Rank 14]	Low Priority (2050)
Rother Levels	1 [Rank 17]	1 [Rank 19]	3 [Rank 19]	Low Priority (2050)
Thanet	2 [Rank 16]	0 [Rank 20]	2 [Rank 20]	Low Priority (2050)

\*Excludes protected area and population benefit scoring

\*\*Includes changes to protected areas, benefits to people, chalk streams

Figure 3.3 Summary of our Catchment Prioritisation Scores



Because the WRSE approach was not available in time to include in our draft plan and because of the concerns we have around the characterisation of some catchments we have chosen to adopt our internal prioritisation approach which was based on the original set of criteria proposed by the EAG and EA, these are mapped at a catchment level in Figure 3.3.

In our assessment We have aggregated the scores up from a water body to Operational Catchment Level and have used this to propose three different horizons for prioritising abstraction reductions based on a high, medium and low ranking. For Operational catchments the highest scoring Water body in each catchment has been used to set priority. To aid profiling of our abstraction reductions we propose that the highest priority scores (>7) should be addressed in 2030's or early 2040s (depending on options). Medium Scores (5-7) should be addressed in the 2040's and lowest scores (<5) by 2050.

However, we recognise that whilst the prioritisation should be respected as much as possible, due to the complexity and long lead times associated with some of our Supply Options it might not be possible to achieve our ambition scenarios at the proposed target dates (e.g. 2040, 2045, 2050) because the additional supply and demand options required to replace that lost water might not be available at that time and hence deficits might be introduced into our plan which could not be solved by new water resource options or water efficiency soon enough to enable our initial Environmental Ambition to be met.

To try and reduce the risk such unsolvable deficits emerging, we conducted a review of the identified Option annual profiles for when new resource schemes become available and by reviewing when, either a Southern Water new resource option or a regional Strategic Water Resource Option, is due to be implemented we can identify when it is most beneficial for the licence change to occur. For example, if we know there is a catchment wide solution such as a desalination plant to be constructed, by delaying a licence change by a few years it can help reduce the need for temporary extra short-term solutions.

Whilst waiting for such schemes to be constructed and licence changes to occur we may consider implementing interim mitigation measures such as river enhancement to benefit and prevent deterioration of the water body until licence changes can be delivered. The viability and design of such schemes will need to be considered as part of our formal WINEP options appraisal process to ensure that these solutions themselves result in environmental improvements.

To undertake the profiling refinement, we reviewed the modelled Options Annual Profiles, from 2025 to 2070's, to determine when new resource schemes were available and being selected in the emerging regional strategy for each WRZ and determined the yield profile for the return periods DYAA 1:100 and DYAA 1:500 for each of the environmental scenarios (BAU+, Central and Alternative).

To adjust the profile, we changed the date at which the Environmental Ambition was achieved for each source to reflect the final year of the AMP period, e.g. If a new regional water company bulk transfer scheme was available in 2042 then the end date for the profile was 2045. We noted the assumptions for the change and amended the profile across each of the environmental scenarios. The schemes were then assigned against their associated sources to determine when they would first take effect for each of the different scenarios and both planning periods.

### 3.9 Including our Environmental Ambition within our Adaptive Plan

Because of the large uncertainty associated with some of the key supply and demand drivers we face we have worked with WRSE to develop an adaptive planning approach that aims tackle the uncertainty in our supply demand balance.

In the Emerging Regional Plan published in early 2021 the adaptive planning approach proposed adopted the “Central” environmental destination scenario as a core pathway up to 2040, thereafter the adaptive plan branched between “Central”, “Enhanced” and “Alternative” scenarios reflecting the range of potential supply reductions and that, by that time, the policy, stakeholder and customer choices which should define which environmental pathway we will follow should be apparent.

For the draft regional plan, and this draft Water Resource Management Plan we have adopted a revised adaptive planning approach. Instead of the branching being policy driven we have instead simplified our Environmental Ambition into three scenarios, high, medium and low which reflect the magnitude of supply-demand balance impact rather than policy choice. This allows greater flexibility in our approach because individual licences changes can be considered and tailored at a source or water body level as appropriate but the range of uncertainty in terms of supply-demand balance impact in those reductions is still covered within the three scenarios.

Table 3.9 summarise how the different policy driven scenarios for our Water Resources Zones presented in WRSE’s emerging regional plan have been mapped across to the simpler High Medium and Low Supply demand balance impact branches in our adaptive plan.

Generally the “Low” scenario maps across to our Central Scenario in most cases, the exception being in Hampshire Andover and Hampshire Winchester, where, based on emerging outcomes from our AMP7 WINEP investigations we believe larger licence reductions are required than originally assessed under the EA Enhanced scenario to meet flow targets.

Our Enhanced Scenario generally maps across to the “medium” scenario and our original “Alternative” Scenario maps across to our “High” scenario. This reflects that although we consider the Enhanced scenario is likely to achieve all formal environmental flow targets, including those for protected sites.

As stated above, our Alternative (High) scenario represents a best-case scenario in terms of maximising environmental benefit but a reasonable worst-case scenario in terms of future supply deficit. This scenario is based on the approach used in Enhanced that maintains and improves Protected Areas, but this scenario goes further to seek maximum environmental benefit a policy choice, if supported by stakeholders and customers, to cease our abstractions that affect the most sensitive environmental receptors, specifically all sources within River Itchen catchment and also from our Pulborough source which may be affected designated wetlands, although investigations to better understand those impacts are ongoing.

**Table 3.9 Mapping from environment scenarios to new labels of Low, Medium and High**

WRZ	New Scenario Mapping		
	"Low"	"Medium"	"High"
HAZ	Enhanced	Central	Alternative
HKZ	Central	Enhanced	Alternative
HRZ	Central	Enhanced	Alternative
HSE	Central	Enhanced	Alternative
HSW	Central	Enhanced	Alternative
HWZ	Enhanced	Central	Alternative
IoW	Central	Enhanced	Alternative
SBZ	Central	Alternative	Enhanced
SWZ	Central	Enhanced	Alternative
KME	Central	Enhanced	Alternative
KMW	Central	Enhanced	Alternative
KTZ	Central	Enhanced	Alternative
SHZ	Central	Enhanced	Alternative
SNZ	Central	Enhanced	Alternative

The proposed adaptive planning branches we are following are set out in Table 3.10

For the Environmental Destination there are several uncertainties that must be investigated before the final policy positions are known. The time taken to undertake these investigations and conclude their outcomes with our regulators will be key to deciding when a decision on environmental destination can be made. From the work undertaken there are two most obvious times when a decision on environmental destinations would be made: 2035 and 2040 and across WRSE we have agreed that the destination branching point should be set in 2035. We should have concluded the majority of our No Deterioration WINEP investigations by this date (most are due for completion by 2027) and will already be implementing licence reductions.

A summary of the final deployable output impacts for each of our High Medium and Low Scenarios is provided in Table 3.11 and summarised by EA operational catchment on Figure 3.4. Because Deployable Output varies with drought severity the overall range of reductions in abstraction compared to more typical daily (recent actual) volumes are more clearly illustrated on Figure 3.5.

Our final time series profiles of deployable output reduction for each WRZ are presented in Appendix C.

Table 3.10 Summary of the Adaptive Planning branches showing the range of uncertainty and key branching point around our Environmental Ambition in 2035.

Root branch (2025-30)	Branching point 1 (2030-35)	Branching point 2 (2035-75)	Situation	
<b>Baseline</b> growth (housing plan); <b>low</b> environmental destination, <b>median</b> climate change impact	<b>Baseline</b> growth incorporating Oxford-Cambridge arc, <b>low</b> environmental destination, <b>median</b> climate change impact	<b>Maximum</b> growth, <b>high</b> environmental destination, <b>high</b> climate change impact	1	
		<b>Baseline</b> growth incorporating Oxford-Cambridge arc, <b>medium</b> environmental destination, <b>median</b> climate change impact	2	
		<b>Baseline</b> growth incorporating Oxford-Cambridge arc, <b>low</b> environmental destination, <b>low</b> climate change impact	3	
	<b>Baseline</b> growth, <b>low</b> environmental destination, <b>median</b> climate change impact	<b>Baseline</b> growth, <b>low</b> environmental destination, <b>median</b> climate change impact	<b>Baseline</b> growth, <b>high</b> environmental destination, <b>high</b> climate change impact	4
			<b>Baseline</b> growth, <b>medium</b> environmental destination, <b>median</b> climate change impact	5
			<b>Baseline</b> growth, <b>low</b> environmental destination; <b>low</b> climate change impact	6
	<b>ONS18</b> growth forecast, <b>low</b> environmental destination, <b>median</b> climate change	<b>ONS18</b> growth forecast, <b>low</b> environmental destination, <b>median</b> climate change	<b>ONS18</b> growth; <b>high</b> environmental destination; <b>high</b> climate change impact	7
			<b>ONS18</b> growth; <b>medium</b> environmental destination; <b>median</b> climate change impact	8
			<b>Minimum</b> growth; <b>low</b> environmental destination; <b>low</b> climate change impact	9

Table 3.11 Summary of deployable output impacts for each Environmental Destination Scenario

WRZ	1 in 500 Deployable Output Reductions by 2050 for each branch (MI/d)		
	Low	Medium	High
HAZ*	-12.40	-11.61	-12.52
HKZ	-4.16	-4.63	-4.16
HRZ	-3.45	-3.45	-3.45
HSE*	0.00	0.00	-20.49
HSW*	0.00	0.00	0.00
HWZ*	-6.68	-12.8	-22.71
IOW	-8.06	-11.02	-14.25
SNZ	-6.76	-6.8	-8.23
SBZ	-6.48	-20.99	-39.44
SWZ	-7.86	-17.87	-19.72
KME	-20.27	-48.51	-48.51
KMW	-3.31	-22.42	-22.70
KTZ	-11.94	-29.56	-29.56
SHZ	-1.56	-1.56	-1.56

\*Where relevant we have also included reductions to DYCP deployable output, e.g. under Alternative or where CSMG is applied in Enhanced as we expect that licence reductions would apply year round, including during times of normal operation outside of drought.

Figure 3.4 Loss in Deployable output (for 1:500 DYAA) to for each Environmental Ambition Scenario by catchment

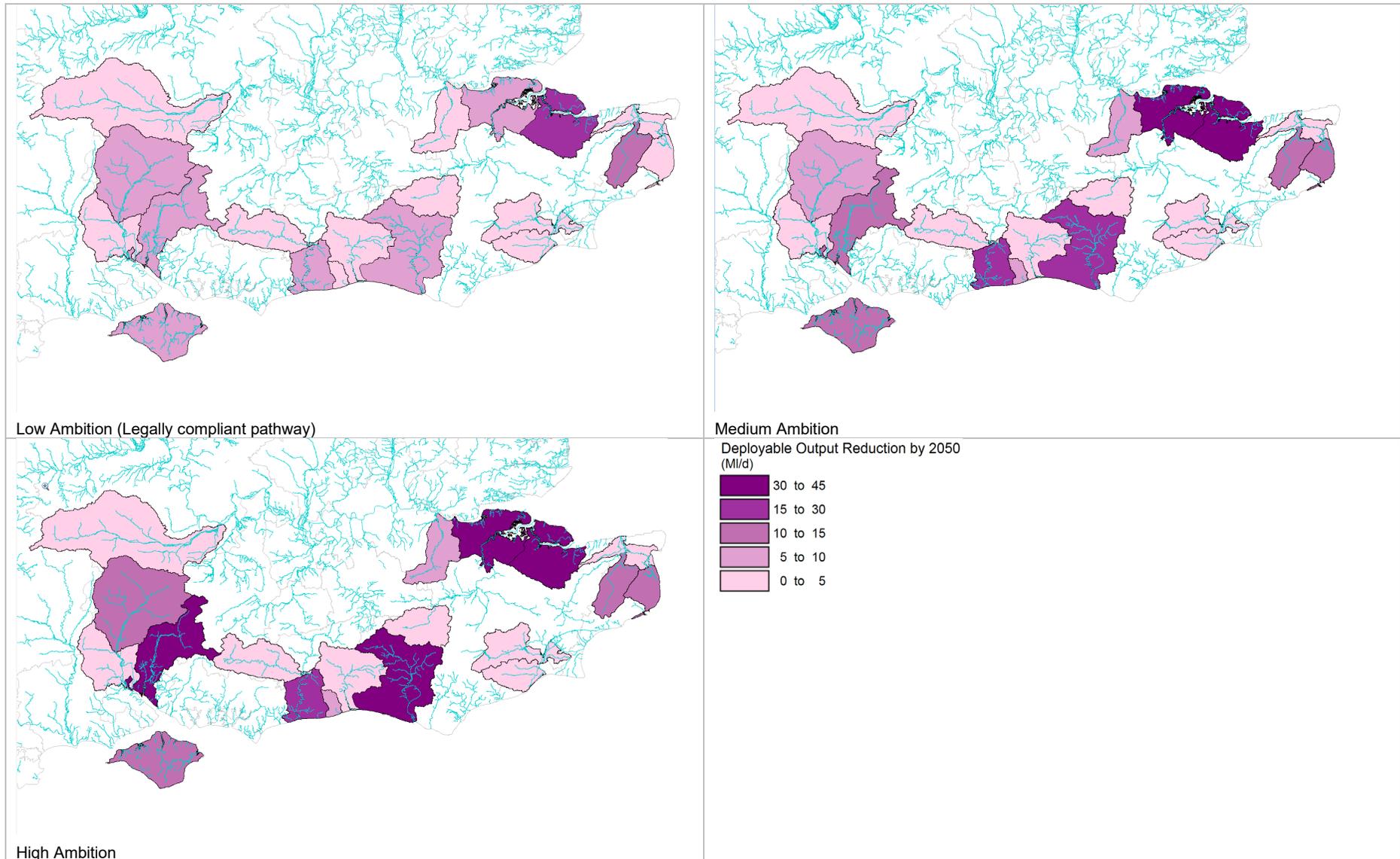
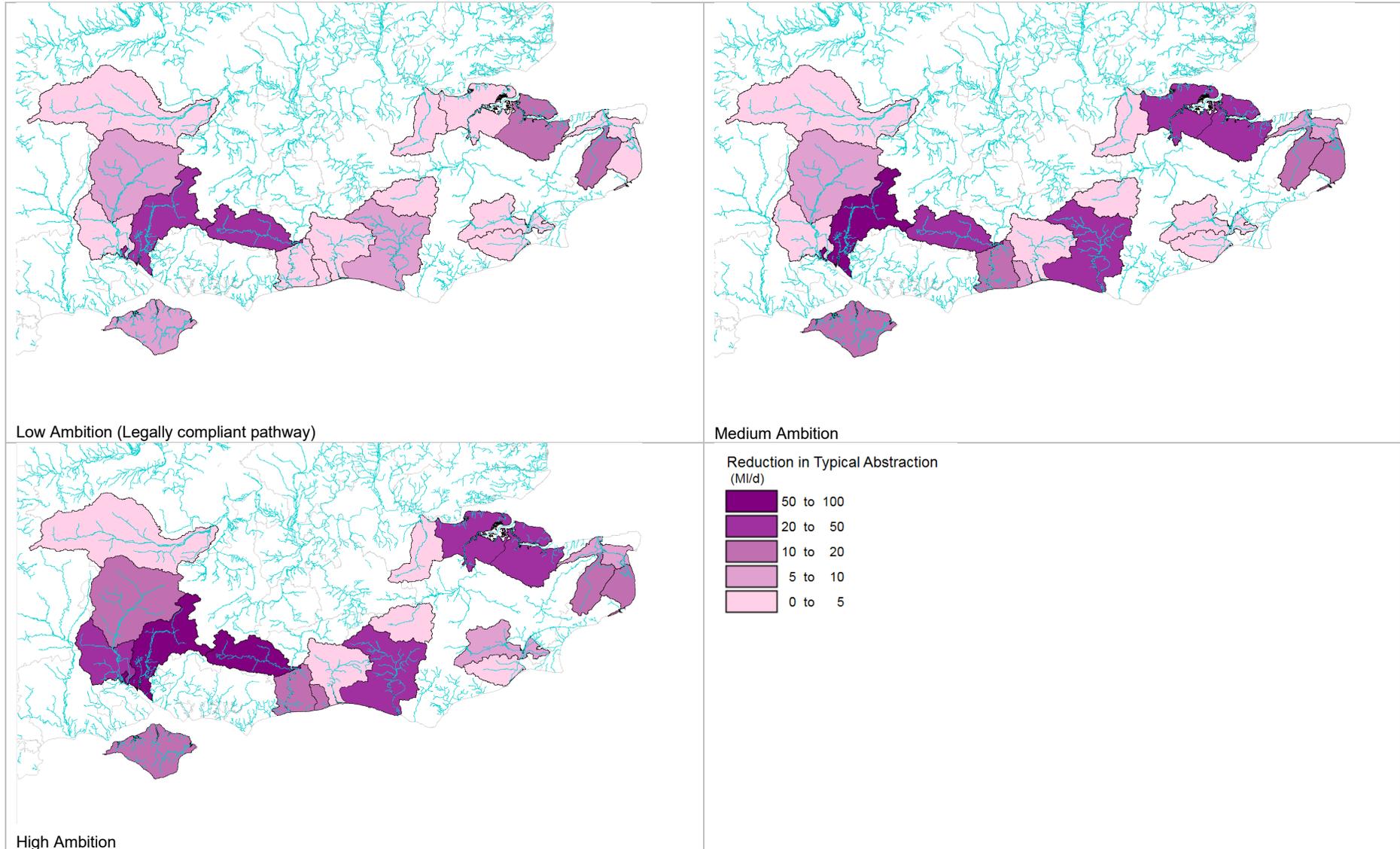


Figure 3.5 Reduction in typical (“Recent Actual”) abstractions required to achieve each level of Environmental Ambition by Catchment



## 3.10 Ongoing Evolution

We will continue to evolve our Environmental Ambition approach through to development of our final WRMP taking account of the outcomes of our WINEP studies and other policy and guidance.

- We will continue to assess our prioritisation approach and re-profiling of abstraction reductions to account for catchment priority and the availability of supply options.
- Continue to review emerging WINEP outcomes, particularly CSMG under some scenarios which has suggested additional reductions in abstraction might be required on some reaches of the River Test and provided further certainty on the magnitude of abstraction reductions required for the River Itchen to meet CSMG targets.
- Adjust our DO reductions to reflect updates and adjustments to baseline DO and which may include further system simulation to reflect conjunctive use effects.
- Review and incorporation of additional EA guidance around the application of licence capping received in April 2022, too late to be incorporated into our dWRMP. A hybrid set of environmental ambition scenarios is being developed which applies Recent Actual Licence caps from AMP9 (2030) onwards, consistent with our ND WINEP expectations.
- Reflection of the PR24 WINEP, as required by the WRPG but which had not yet been finalised at the time of preparing our dWRMP.
- Inclusion of additional sensitivity Scenarios to examine varying the timing and priority at which the Environmental Ambition is delivered.

## 3.11 Environment Ambition Summary

We have outlined our ambition to achieve sustainable abstraction and determine a long-term environmental destination. Our overall aim is to establish our long-term sustainable licensing of our sources as soon as possible, so that we can progress supply-demand planning and management on a stable and more certain footing. The primary route for this will be our series of ongoing WINEP and environmental investigations including detailed monitoring and modelling to provide a robust evidence base to inform the most appropriate set of long-term licence reductions and mitigations that will deliver considerable environmental benefits alongside those delivered through our Catchment First programme (Section 2). Through this work we expect that the uncertainty associated with the range of possible licence reductions considered under our ambition scenarios will reduce considerably. By the time of our next WRMP in 2029 the WINEP and investigations will enable us to have greater certainty around the long-term strategic solutions that are still required and the appropriate adaptive planning decision points.

In working towards our goal of achieving sustainable abstraction, we have:

- Used the supplementary guidance 'actions required to prevent deterioration' to inform our Environmental Ambition scenarios. We have applied an initial review of licence capping based on our assessment. Our ongoing work through our extensive ND WINEP will continue to refine and inform licence changes needed to prevent deterioration. We expect these to begin from 2030.
- We have identified our role associated with the actions identified through the Water Abstraction Plans for achieving sustainable abstraction. We have highlighted our continued regard to the River Basin Management Plans and WFD regulations objectives, the delivery of measures through ongoing investigation, monitoring and delivery of solutions via WINEP.
- We have taken account of government and regulator objectives for the environment and highlighted our work associated with vulnerable chalk streams. Our long-term destination scenarios propose significant reductions in our chalk groundwater abstractions to support nature recovery, and meet environmental flow or other agreed WFD targets.
- We will deliver the regulatory actions required to avoid deterioration, and meet targets for Protected Areas through the continuing development of our WINEP and proposed interim mitigation measures before final delivery of water resource schemes.
- Where our investigations show it is needed, we will also support nature recovery through river and habit enhancement alongside any required reductions to our abstractions.
- We have been ambitious: through our 'alternative' scenario we are investigating what solutions would be required to allow us to stop all abstraction in our most sensitive catchments including the River Itchen and Lower River Rother and Arun to remove any potential risk to designated wetlands.
- We have brought forward many of our WINEP investigations.
- Through the development of the regional and our own specific environmental scenarios we are exploring the impact of potential climate change scenarios to 2050 and beyond.
- We have not been constrained by previous decisions, and have revisited past WINEP outcomes previously considered non cost beneficial to support full flow recovery in all of our ambition scenarios. This includes catchments such as the River Anton, Lukely Brook and Lewes Winterbourne.
- We have considered the most appropriate timing by reviewing and prioritising the catchments where abstraction reductions are most needed and will have the greatest impact. We've balanced that against our available alternate supply options to ensure supplies remain resilient.

We expect that our ambition will continue to evolve as we shape our final WRMP and take account changes in policy, guidance and the continuing assessment of outcomes from our WINEP investigations.

# **Appendix A WRSE Technical Note and Method Statement**

WRSE Environmental Ambition Technical Note, Version D

WRSE Method Statement: Environmental Ambition, Post-consultation version January 2022

# Appendix B Basis for Central and Alternative Scenario

All Deployable Outputs stated as 1 in 500 dry year for comparison

**Table 5.1: Western Area - Hampshire Andover (HA), Hampshire Kingsclere (HK) and Hampshire Rural (HR)**

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
HA	Andover	Upper and Middle Test	Anton - Upper	3	9	13.00	10.53	13.00	5.81	5.81	5.02	Although the AMP6 WINEP investigation resulted in a smaller sustainability reduction than forecast in WRMP19, and is sufficient to address the risk of deterioration, it does not resolve the full impacts of Andover's abstraction on the River Anton.	5.02	Although the AMP6 WINEP investigation resulted in a smaller sustainability reduction than forecast in WRMP19, and is sufficient to address the risk of deterioration, it does not resolve the full impacts of Andover's abstraction on	Not explicit but DO is below RA. Note ND licence cap already applied in 2020 (licence change included in baseline SRs for BVP upload)	Upper Anton is not part of Test SSSI so not considered

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
											Resolving this flow deficit is considered with the EA Environmental Destination and the magnitude of reduction required is known from the AMP6 Study. Development of the Hampshire grid presents an opportunity to resolve the sustainability of this licence and occurs prior to 2040 and the required reductions are broadly consistent with the WRMP19 assumptions.		the River Anton. Resolving this flow deficit is considered with the EA Environmental Destination and the magnitude of reduction required is known from the AMP6 Study. Development of the Hampshire grid presents an opportunity to resolve the sustainability of this licence and occurs prior to 2040 and the required			

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (MI/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
														reductions are broadly consistent with the WRMP19 assumptions.		
HA	Chilbolton	Upper and Middle Test	Test - conf Dever to conf Anton	3	2	0.50	0.22	0.00	0.50	0.50	0.00	Assume this site is not available as return to service may be impacted by No Deterioration	0.00	Assume this site is not available as return to service may be impacted by No Deterioration	Revoking (both scenarios) would meet ND obligation and therefore licence cap	Site to be revoked so not relevant. Anton is not part of Test SSSI so not considered
HA	near Whitchurch	Upper and Middle Test	Bourne Rivulet	3	2	5.71	2.30	2.30	5.71	5.71	2.30	No sustainability reductions were assumed in WRMP19. The Test Chalk groundwater body is presently in surplus and	2.3	No sustainability reductions were assumed in WRMP19. The Test Chalk groundwater body is	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is	Bourne Rivulet is not part of Test SSSI so not considered

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (MI/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
												impacted surface water body is EFI compliant. At present we have assumed no further sustainability reduction in our Environmental Destination Scenarios.		presently in surplus and impacted surface water body is EFI compliant. At present we have assumed no further sustainability reduction in our Environmental Destination Scenarios.	compliant.  May need to cap at 2.3MI/d if DO write up included	
HA	Overton	Upper and Middle Test	Test (Upper)	3	5	1.64	0.81	1.50	1.64	1.64	1.50	No sustainability reductions were assumed in WRMP19. The Test Chalk groundwater body is presently in surplus and	0.00	Based on Upper limit of CSMG non compliance. Needs to apply at PDO too	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly	CSMG impacts and targets now included in Alternative Scenario based on latest WINEP outcomes Note Enhanced scenario was adjusted to match latest WINEP outcomes for CSMG

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
												impacted surface water body is EFI compliant. At present we have assumed no further sustainability reduction in our Central Scenario			assume is compliant	(including PDO reduction)
HA	Whitchurch	Upper and Middle Test	Test (Upper)	3	5	1.64	0.70	1.64	1.64	1.64	1.64	No sustainability reductions were assumed in WRMP19. The Test Chalk groundwater body is presently in surplus and impacted surface water body is EFI compliant. At present we	0	Based on Upper limit of CSMG non compliance. Needs to apply at PDO too	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	CSMG impacts and targets now included in Alternative Scenario based on latest WINEP outcomes Note Enhanced scenario was adjusted to match latest WINEP outcomes for CSMG (including PDO reduction)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
												have assumed no further sustainability reduction in our Central Scenario				
HK	Newbury	Kennet	Enborne (Source to downstream A34)	5	2	3.00	1.12	1.50	1.20	1.20	3.00	No sustainability reductions were assumed in WRMP19. The Test Chalk groundwater body is presently in surplus and impacted surface water body is EFI compliant. At present we have assumed no further sustainability reduction in our Environmental	1.50	No sustainability reductions were assumed in WRMP19. For enhanced Cap at ND baseline rate	Included under Alternative Scenario (but date differs)	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (MI/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
												Destination Scenarios.				
HK	near Basingstoke	Kennet	Kingsclere Brook (Source to Enborne)	5	7	5.70	0.00	3.90	2.85	2.85	3.02	This site is subject to an ongoing AMP7 WINEP investigation, at present this study remains in the early stages and hence there is a degree of uncertainty about the magnitude of future sustainability reductions. In the absence of better data the WRMP19 sustainability reductions should be assumed and	3.02	This site is subject to an ongoing AMP7 WINEP investigation, at present this study remains in the early stages and hence there is a degree of uncertainty about the magnitude of future sustainability reductions. In the absence of better data the WRMP19 sustainability reductions should be assumed and	Not explicitly, but destination prevents deterioration in longer term as future licence below ND baseline rate	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
												this is consistent with our current Environmental Destination forecasts.		this is consistent with our current Environmental Destination forecasts.		
HR	Kings Sombourne	Upper and Middle Test	Test - conf Anton to conf Dun	3	3	5.00	1.41	1.50	4.85	4.85	1.50	This site has been screened out of No Deterioration Investigations as growth in abstraction is not possible due to infrastructure constraints. The Test Chalk groundwater body is presently in surplus and impacted surface water body is EFI	1.50	This site has been screened out of No Deterioration Investigations as growth in abstraction is not possible due to infrastructure constraints. The Test Chalk groundwater body is presently in surplus and impacted	DO already at or below expected licence cap (ND rate) and site has been screened out from ND investigations as no risk of growth	Middle Test is CSMG compliant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
											<p>compliant. At present we have assumed no further sustainability reduction in our Environmental Destination Scenarios.</p> <p>We have excluded the potential impacts of CSMG from this assessment as the potential impacts (on normal year DO) would be large, though there is no further effect on drought DO. Furthermore the application of CSMG and</p>		<p>surface water body is EFI compliant. At present we have assumed no further sustainability reduction in our Environmental Destination Scenarios.</p> <p>We have excluded the potential impacts of CSMG from this assessment as the potential impacts (on normal year DO) would be large, though</p>			

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
												the timing of such are uncertain.		there is no further effect on drought DO. Furthermore the application of CSMG and the timing of such are uncertain.		
HR	Romsey	Lower Test and Southampton Streams	Test - conf Dun to Tadburn Lake	3	4	13.68	4.74	5.40	13.68	13.68	5.40	No sustainability reductions were forecast in WRMP19 for this source. As recent actual abstraction is presently below the deployable output there remains potential for growth in abstraction at	5.4	No sustainability reductions were forecast in WRMP19 for this source. As recent actual abstraction is presently below the deployable output there remains potential for	Included under both Central and Alternative Scenarios which reduce to expected licence cap (ND baseline) but date differs	Middle Test is CSMG compliant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central (Low) Scenario		BVP Alternative (High) Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	WRZ	Source	Licence Capping	CSMG
											<p>this site, and hence a risk of deterioration. The Test Chalk groundwater body is presently in surplus and impacted surface water body is EFI compliant. The most likely outcome therefore is a cap on abstraction at recent actual rates and this is likely to occur before 2040.</p>		<p>growth in abstraction at this site, and hence a risk of deterioration. The Test Chalk groundwater body is presently in surplus and impacted surface water body is EFI compliant. The most likely outcome therefore is a cap on abstraction at recent actual rates and this is likely to occur before 2040.</p>			

Table 5.2: Western Area - Hampshire Winchester (HW) Hampshire Southampton West (HSW) and Hampshire Southampton East (HSE)

MRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
HW	Barton Stacey	Upper and Middle Test	Test – Bourne Rivulet to conf Dever	3	3	1.12	0.80	1.12	1.12	1.12	1.12	No sustainability reductions were assumed in WRMP19. The Test Chalk groundwater body is presently in surplus and impacted surface water body is EFI compliant. At present we have assumed no further sustainability reduction in our Environmental Destination Scenarios.	1.12	No sustainability reductions were assumed in WRMP19. The Test Chalk groundwater body is presently in surplus and impacted surface water body is EFI compliant. At present we have assumed no further sustainability reduction in our	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
													Environmental Destination Scenarios.			
HW	Winchester	Itchen	Itchen	6	6	18.18	13.10	13.30	13.64	13.64	9.91	This site is subject to an ongoing AMP7 WINEP investigation. The emerging outcomes suggest some form of sustainability reduction will be required owing to abstraction impacts on the Itchen Wetlands. Until further data emerges the WRMP19 sustainability	0	The emerging outcome from our AMP7 WINEP study indicates that flow targets (EFI) for the Candover Stream cannot be met with any level of abstraction from Totford. We should assume that no DO from Totford will be available and that is change is	Not explicitly, but destination prevents deterioration in longer term as future licence below ND baseline rate	Not explicit but Alternative scenario revokes all Itchen abstraction so implicitly meets CSMG targets. Note Enhanced scenario was adjusted to match latest WINEP outcomes for CSMG (including PDO reduction)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
												assumptions should be assumed and this is consistent with our Environmental Destination scenarios.		likely to occur in the late 2020s/early 2030s and hence should be considered in SRO design.		
HW	Alresford	Itchen	Candover Brook	6	6	4.55	2.54	2.90	2.73	2.73	0.00	The emerging outcome from our AMP7 WINEP study indicates that flow targets (EFI) for the Candover Stream cannot be met with any level of abstraction from Totford. We should assume that no	0.00	All Itchen Abstraction ceased under this scenario	Not explicitly, but destination prevents deterioration in longer term as future licence below ND baseline rate - licence is to be revoked by ~2030	Not explicit but Alternative scenario revokes all Itchen abstraction so implicitly meets CSMG targets. Note Enhanced scenario was adjusted to match latest WINEP outcomes for CSMG (including PDO reduction)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
												DO from Totford will be available and that is change is likely to occur in the late 2020s/early 2030s and hence should be considered in SRO design.				
HSW	Test Surface Water	Lower Test and Southampton Streams	Blackwater (Test and Itchen)	3	6	80.00	52.56	52.70	80.00	64.00	0.00	2027 licence reduction addresses EFI, no drought DO anyway	0.00	2027 licence reduction addresses EFI, no drought DO anyway but assume CSMG compliance removes	DO already at or below expected licence cap (ND rate) except in normal year so can implicitly assume is compliant across most scenarios  Test Surface Water has been	Not explicit, at time of EP development CSMG targets were not expected to impact R. Test

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
													normal year DO	screened out of further No Deterioration Studies so assume is compliant		
HSE	Itchen GW	Itchen	Itchen	6	8	35.94	24.67	28.50	23.64	12.17	41	Assumes Q95 EFI compliance (essentially the same as CSMG as at ASB1 but for central only for ADO/MDO).	0.00	All Itchen Abstraction ceased under this scenario	Destination prevents deterioration in longer term as future licence below ND baseline rate -	Licence revoked under Alternative, CSMG implicitly met. CSMG also effectively met under Central as meets Q95 EFI
HSE	Itchen SW	Itchen	Itchen	6	7	45.59	20.59	16.50	2.28	0.00						
HSE	Twyford	Itchen	Itchen	6	8	36.49	15.95	13.30	14.23	14.23						

Table 5.3: Western Area – Isle of Wight (IOW)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
IOW	Lukely Brook	Isle of Wight Rivers	Lukely Brook	5	9	1.50	1.96	1.50	0.00	0.00	0.79	The outcome of AMP6 WINEP studies at Bowcombe resulted in no loss to the 1 in 200 DO because it was not considered cost beneficial. Although the 2020 licence variation has addressed the risk of deterioration the revised licence still does not allow flow targets (Environmental Flow Indicator) to be met in the Lukely Brook. Given that	0	Revoke to achieve Lukely Brook EFI and IoW Rivers goal	ND investigation already complete and licence effectively "capped" to prevent deterioration. Destination also prevents deterioration in longer term as future licence below ND baseline rate.	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
											<p>Proposed Licence</p> <p>Rationale</p> <p>impacts are now known (following the AMP6 WINEP study) and the development of the Sandown Recycling scheme, which would provide a potential opportunity for consideration of a more environmentally sustainable licence which meets all flow targets, we should adopt the proposed reduction from WRMP19 which is consistent with the AMP6 WINEP study</p>					

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
												and is likely to be able to occur prior to 2040, but after Sandown recycling scheme is in operation.				
IOW	Broadfields	Isle of Wight Rivers	IOW Solent Group	5	#N/A	1.06	0.00	0.00	1.06	0.16	0.00	Revoke	0.00	Revoke	Licence to be revoked so licence cap implicitly met	Not relevant
IOW	Caul Bourne	Isle of Wight Rivers	Caul Bourne	5	6	1.64	0.70	0.80	0.49	0.49	0.80	Not in current WINEP, cap at Recent Actual	0.00	Enhanced EFI recovery (abandon source)	Included under both scenarios (but date differs)	Not relevant
IOW	Newport	Isle of Wight Rivers	Lukely Brook	5	7	10.70	7.92	10.70	1.54	0.77	3.42	The outcome of AMP6 WINEP studies at Carisbrooke resulted in no loss to the 1 in 200 DO because it was not	0.00	Revoke to achieve Lukely Brook EFI and IoW Rivers goal	ND investigation already complete and licence effectively "capped" to prevent deterioration. Destination also	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
											considered cost beneficial. Although the 2020 licence variation has addressed the risk of deterioration the revised licence still does not allow flow targets (Environmental Flow Indicator) to be met in the Lukely Brook. Given that impacts are now known (following the AMP6 WINEP study) and the development of the Sandown Recycling scheme, which would provide a			prevents deterioration in longer term as future licence below ND baseline rate		

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
											potential opportunity for consideration of a more environmentally sustainable licence which meets all flow targets, we should adopt the proposed reduction from WRMP19 which is consistent with the AMP6 WINEP study and is likely to be able to occur prior to 2040, but after Sandown recycling scheme is in operation.					

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
IOW	Rookley	Isle of Wight Rivers	Medina	5	4	3.11	0.67	0.70	1.63	1.63	0.70	No sustainability reductions were considered for Chillerton in WRMP19 and the site has been screened out of No deterioration studies. However it has been earmarked for potential reductions as part of the EA Environmental Destination, the most likely outcome would be to impose an annual licence cap based on recent actual rates, this would likely preserve current DO.	0.70	No sustainability reductions were considered for Chillerton in WRMP19 and the site has been screened out of No deterioration studies. However it has been earmarked for potential reductions as part of the EA Environmental Destination, the most likely outcome would be to impose an	Included under both scenarios (but date differs)	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
													annual licence cap based on recent actual rates, this would likely preserve current DO.			
IOW	IoW Augmentation	Isle of Wight Rivers	AP2, Shide, GB107101006220, GB107101006210	5	#N/A	#N/A	#N/A		#N/A	#N/A		No reduction / No DO as augmentation scheme		No reduction / No DO as augmentation scheme	Screened out of ND investigation, no licence cap considered necessary	Not relevant
IOW	Newchurch	Isle of Wight Rivers	AP1 Bembridge, AMP6, Burnt House	5	#N/A	8.31	4.23	2.90	8.31	7.37	2.90	Assumes cap at Recent Actual rate to prevent Deterioration	2.90	Assumes cap at Recent Actual rate to prevent Deterioration	Included under both scenarios (but date differs)	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
			GS													
IOW	Sandown	Isle of Wight Rivers	Eastern Yar (Lower)	5	8	15.00	6.94	7.70	9.00	9.00	2.90	Assumes cap at Recent Actual rate to prevent Deterioration	2.90	Assumes cap at Recent Actual rate to prevent Deterioration	Included under both scenarios (but date differs)	Not relevant
IOW	Shalcombe	Isle of Wight Rivers	Caul Bourne	5	6	0.60	0.28	0.00	0.00	0.00	0.00	Site mothballed, no plans to RTS	0.00	Site mothballed, no plans to RTS	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant
IOW	Ventnor3	Isle of Wight Rivers	IOW Southern Downs Chalk and Upper Greensand	5	4	0.49	0.32	0.00	0.32	0.17	0.00	Site mothballed, no plans to RTS	0.00	Site mothballed, no plans to RTS	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVO Central Scenario		BVP Alternative Scenario		Other considerations		
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG	
																implicitly assume is compliant	
IOW	Ventnor	Isle of Wight Rivers	Wroxall Stream	5	5	3.28	2.75	0.00	2.55	1.64	0.00	Site mothballed, no plans to RTS	0.00	Site mothballed, no plans to RTS	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant	

Table 5.4: Central Area – Sussex North (SN)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
SN	Arun	Lower Arun	Arun (U/S Pallingham)	6	4	10.03	2.46	10.00	10.03	10.03	10	No reduction for Arun, flows supported by upstream WWTW	10	No reduction for Arun, flows supported by upstream WWTW	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant
SN	Pulborough GW	Western Rother	Western Rother	3	6	16.50	9.26	13.00	9.90	7.66	5.55465	Min of WRSE BAU or WRMP19 SR	0	Revoke in Alternative	Not explicitly, but destination prevents deterioration in longer term as future licence below ND baseline rate.	Not relevant
SN	Pulborough SW	Western Rother	Western Rother	3	5	58.50	40.58	47.80	17.55	13.16	17.55	WRSE BAU+	0.00	Revoke in Alternative	Not explicitly, but destination prevents deterioration in	Not relevant

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WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
															longer term as future licence below ND baseline rate.	
SN	Petworth	Western Rother	Haslingbourne Stream	3	0	2.49	0.00	0.00	0.00	0.00	0	Revoke, no DO	0	Revoke, no DO	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant
SN	Petworth South	Western Rother	Lod	3	0	2.14	1.33	1.60	1.32	1.32	1.32	WRSE BAU+	0.82	Min of WRSE Enhanced / WRMP19 SR	Not explicitly, but destination prevents deterioration in longer term as future licence below ND baseline rate.	Not relevant

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Annex 9 Environmental Ambition. Protecting and Enhancing the Environment

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations		
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG	
SN	Petersfield	Western Rother	Western Rother Durford	3	1	2.28	0.00	0.00	0.00	0.00	0.00	0.00	WRSE BAU+	0.00	Min of WRSE Enhanced / WRMP19 SR	Not explicitly, but destination prevents deterioration in longer term as future licence below ND baseline rate.	Not relevant
SN	Midhurst	Western Rother	Western Rother	3	3	2.19	1.29	1.90	1.32	1.32	1.32	WRSE BAU+	0.77	Min of WRSE Enhanced / WRMP19 SR	Not explicitly, but destination prevents deterioration in longer term as future licence below ND baseline rate.	Not relevant	
SN	West Chiltington	Lower Arun	Chilt	6	3	3.41	0.00	0.00	0.17	0.17	0.00	WRSE BAU+	0.00	Min of WRSE Enhanced / WRMP19 SR	Not explicitly, but destination prevents deterioration in longer term as future licence	Not relevant	

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WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
															below ND baseline rate.	
SN	Weir Wood	Upper Medway	Medway at Weir Wood	1	3	21.82	7.99	5.40	8.73	8.73	5.40	WRSE BAU+	3.194677	Min of WRSE Enhanced / WRMP19 SR	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant
SN	Steining	Upper Adur	Brighton Chalk Block	5	4	1.63	0.85	1.20	1.63	0.82	0.852047	WRSE BAU+	0.43	Min of WRSE Enhanced / WRMP19 SR	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant

Table 5.5: Central Area – Sussex Brighton (SB)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
SB	Rottingdean	Upper Ouse	Brighton Chalk Block	5	0	18.97	11.55	12.10	12.33	12.33	11.41 801	WRMP19 SR Assumption (will reduce Saline Intrusion Risk)	11.42	WRMP19 SR Assumption (will reduce Saline Intrusion Risk)	Included under both scenarios (but date differs)	Not relevant
SB	Falmer	Upper Ouse	Winterbourne Steam at Lewes	5	6	12.27	7.47	6.60	7.98	7.98	2.1	Limit to WRMP19 DO	2.10	Min of WRMP19 DO / ND baseline rate	DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant
SB	Hove	Upper Ouse	Brighton Chalk Block	5	0	11.16	6.80	13.00	0.00	0.00	13	No reduction, environmental impact likely negligible	13.00	No reduction, environmental impact likely negligible	DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant
SB	North Falmer A	Upper Ouse	Winterbourne	5	9	3.77	2.29	4.20	0.00	0.00	2.5	Limit to WRMP19 DO	1.25	WRMP19 SR assumption	Not considered explicitly, but DO already at or below expected licence cap (ND	Not relevant

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WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
			Steam at Lewes											to recover EFI	rate) so can implicitly assume is compliant	
SB	Lewes Road	Upper Ouse	Brighton Chalk Block	5	2	3.90	2.38	0.00	2.34	2.34	0	Revoke, no DO	0.00	Revoke, no DO	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant
SB	Hove B	Upper Ouse	Brighton Chalk Block	5	0	9.76	5.95	3.90	6.35	6.35	3.9	Limit to ND baseline	3.90	Min of WRMP19 DO / AMP7 ND investigation baseline rate	Included under both scenarios (but date differs)	Not relevant
SB	North Shoreham	Upper Adur	Brighton Chalk Block	5	0	0.00	0.00	1.30	0.00	0.00	1.3	WRMP19 ND Baseline (to prevent saline intrusion)	1.30	WRMP19 ND Baseline (to prevent saline intrusion)	Included under both scenarios (but date differs)	Not relevant
SB	North Falmer B	Upper Ouse	Winterbourne	5	9	8.23	5.01	11.00	0.00	0.00	10.89	Limit to WRMP19 DO	2.73	WRMP19 SR assumption	Not considered explicitly, but DO already at or below expected licence cap (ND	Not relevant

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WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
			Steam at Lewes										to recover EFI	rate) so can implicitly assume is compliant		
SB	Brighton A	Upper Ouse	Brighton Chalk Block	5	2	9.76	5.95	10.10	0.00	0.00	8.1	Min of WRSE BAU, WRMP19 DO, ND Baseline rate (to meet area EA reduction target for Little Stour and Wingham)	8.10	Min of WRSE BAU, WRMP19 DO, ND Baseline rate (to meet area EA reduction target for Little Stour and Wingham)	DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant, explicitly considered for both Scenarios	Not relevant
SB	Shoreham	Upper Adur	Brighton Chalk Block	5	5	5.58	3.40	5.90	0.00	0.00	5.199	WRMP19 ND Baseline (to prevent saline intrusion)	5.20	Min of WRSE BAU, WRMP19 DO, ND Baseline rate	Included under both scenarios (but date differs)	Not relevant
SB	Sompting	Teville	Teville Stream	5	9	7.19	5.52	9.00	2.52	0.72	8	Limit to just BH4	4.13	WRMP19 SR assumption	Not considered explicitly, but DO already at or below expected licence cap (ND	Not relevant

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WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
												(provisional WRSE DO)		to recover EFI	rate) so can implicitly assume is compliant	
SB	Lewes	Upper Ouse	Winterbourne Steam at Lewes	5	6	13.94	8.49	10.80	1.63	1.16	10.8	WRMP19 SR Assumption (i.e. EFI driven for Lewes Winterbourne) - will also reduce Saline Intrusion Risk	5.90	WRMP19 SR assumption to recover EFI	Not considered explicitly, but DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant	Not relevant
SB	Brighton B	Upper Ouse	Brighton Chalk Block	5	2	4.22	2.60	1.10	2.74	2.74	2.5	Limit to WRMP19 DO	2.50	Limit to WRMP19 DO	May need cap / investigation	Not relevant

Table 5.6: Central Area – Sussex Worthing (SW)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
SW	Littlehampton	Lower Arun	Black Ditch (W Sussex)	6	9	4.37	2.57	1.40	0.00	0.00	1.4	Min of WRMP19 DO / AMP7 ND investigation baseline rate	0.84	Min of WINEP ND baseline or WRMP19 SR Assumption to achieve EFI	Included under both scenarios (but date differs)	Not relevant
SW	Arundel	Lower Arun	Chichester Chalk	6	3	2.81	1.73	2.10	0.00	0.00	2.1	Min of WRMP19 DO / AMP7 ND investigation baseline rate	2.10	Min of WINEP ND baseline or WRMP19 SR Assumption to achieve EFI	Included under both scenarios (but date differs)	Not relevant
SW	Worthing	Teville	Teville Stream	5	9	14.06	10.88	12.20	0.63	0.00	12.2	Min of WRMP19 DO / AMP7 ND investigation	6.77	Min of WINEP ND baseline or WRMP19 SR	Included under both scenarios (but date differs)	Not relevant

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Annex 9 Environmental Ambition. Protecting and Enhancing the Environment

MRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
												baseline rate (cap licence at 12.2Ml/d)		Assumption to achieve EFI		
SW	South Arundel	Lower Arun	Burpham Trib (R.Arun)	6	7	15.62	5.77	9.20	0.00	0.26	6.64	WRMP19 1 in 200 DO (to reduce risk of Saline Intrusion)	6.28	Min of WINEP ND baseline or WRMP19 SR Assumption to achieve EFI	DO already at or below expected licence cap (ND rate) so can implicitly assume is compliant. Included in Alternative Scenario	Not relevant
SW	Long Furlong A	Lower Arun	Black Ditch (W Sussex)	6	9	2.81	2.59	2.00	1.34	1.34	2	Min of WRMP19 DO / AMP7 ND investigation baseline rate	0.45	Min of WINEP ND baseline or WRMP19 SR Assumption to achieve EFI	Included under both scenarios (but date differs)	Not relevant
SW	North Worthing	Teville	Teville Stream	5	8	7.19	3.30	4.90	0.00	1.08	4.9	Min of WRMP19 DO / AMP7 ND	4.90	Min of WINEP ND baseline or WRMP19 SR	Included under both scenarios (but date differs)	Not relevant

MRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
												investigation baseline rate		Assumption to achieve EFI		
SW	North Arundel	Lower Arun	Chichester Chalk	6	4	2.81	2.54	2.90	0.00	0.00	2.9	Min of WRMP19 DO / AMP7 ND investigation baseline rate	2.90	Min of WINEP ND baseline or WRMP19 SR Assumption to achieve EFI	Included under both scenarios (but date differs)	Not relevant
SW	East Worthing	Teville	Teville Stream	5	9	4.37	2.62	3.70	0.00	0.00	3.7	Min of WRMP19 DO / AMP7 ND investigation baseline rate	1.93	Min of WINEP ND baseline or WRMP19 SR Assumption to achieve EFI	Included under both scenarios (but date differs)	Not relevant
SW	Long Furlong B	Lower Arun	Black Ditch (W Sussex)	6	8	5.62	2.61	3.20	0.84	0.84	3.2	Min of WRMP19 DO / AMP7 ND	1.08	Min of WINEP ND baseline or WRMP19 SR	Included under both scenarios (but date differs)	Not relevant

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MRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
												investigation baseline rate		Assumption to achieve EFI		
SW	Durrington	Lower Arun	Ferring Rife	6	8	0.00	0.00	5.10	0.00	0.00	5.1	Min of WRMP19 DO / AMP7 ND investigation baseline rate	2.96	Min of WINEP ND baseline or WRMP19 SR Assumption to achieve EFI	Included under both scenarios (but date differs)	Not relevant
SW	South Arundel A	Lower Arun	Worthing Chalk	6	6	5.00	3.08	3.70	1.25	0.00	3.7	Min of WRMP19 DO / AMP7 ND investigation baseline rate	1.37	Min of WINEP ND baseline or WRMP19 SR Assumption to achieve EFI	Included under both scenarios (but date differs)	Not relevant

Table 5.7: Eastern Area - Kent Medway West (KMW)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
KMW	Cuxton	Lower Medway	North Kent Medway Chalk	0	2	5.54	0.12	5.60	0.28	0.28	5.1	Min of WRSE DO, ND baseline rate	0.00	Min of WRSE Enhanced / WRMP19 SR	Included under Central, Alternative goes further	Not relevant
KMW	Longfield	Darent	Middle and Lower Darent	5	6	6.83	3.89	4.20	0.00	0.00	4.2	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KMW	Gravesend South	Lower Medway	North Kent Medway Chalk	0	2	4.74	2.96	4.40	4.74	4.74	4.4	Min of WRSE DO, ND baseline rate	4.40	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KMW	Higham	Lower Medway	North Kent Medway Chalk	0	2	0.79	0.24	0.40	0.28	0.28	0.4	Min of WRSE DO, ND baseline rate	0.28	Min of ND baseline	Included under Central,	Not relevant

WRZ		Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	CSMG
										BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale		
														rate, WRSE Enhanced	Alternative goes further		
KMW		North Cuxton	Lower Medway	North Kent Medway Chalk	0	2	5.54	4.74	4.00	4.98	2.21	4	Min of WRSE DO, ND baseline rate	2.21	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KMW		Meopham	Lower Medway	North Kent Medway Chalk	0	2	3.43	1.28	2.60	1.37	1.37	2.6	Min of WRSE DO, ND baseline rate	1.37	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KMW		Luddesdown Greensand	Lower Medway	Kent Greensand Middle	0	#N/A	1.32	0.20	0.00	1.32	1.32	0	Revoke, no DO	0.00	Revoke, no DO	Included under Central, Alternative goes further	Not relevant
KMW		Northfleet Chalk	Lower Medway	North Kent Medway Chalk	0	2	10.54	0.67	7.20	0.00	0.00	7.2	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant

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Annex 9 Environmental Ambition. Protecting and Enhancing the Environment

WRZ		Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
										BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
KMW		Northfleet Greensand	Lower Medway	Kent Greensand Middle	0	#N/A	4.21	2.09	0.00	2.10	2.10	0	Revoke, no DO	0.00	Revoke, no DO	Included under Central, Alternative goes further	Not relevant
KMW		RMS	Lower Medway	#N/A	0	#N/A	241.96	83.85	71.36	92.86	92.86		No reduction for RMS		No reduction for RMS		Not relevant
KMW		Strood	Lower Medway	North Kent Medway Chalk	0	2	6.85	2.76	2.20	3.08	3.08	2.2	Min of WRSE DO, ND baseline rate	2.20	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KMW		Rochester	Lower Medway	North Kent Medway Chalk	0	2	1.85	1.67	0.40	0.00	0.00	0.4	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KMW		Wallend	Lower Medway	North Kent Medway Chalk	0	#N/A	1.83	0.06	0.00	0.09	0.00	0	Revoke, no DO	0.00	Revoke, no DO	Included under Central, Alternative goes further	Not relevant

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WRZ		Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
										BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
KMW		Gravesend	Lower Medway	North Kent Medway Chalk	0	2	3.69	0.17	0.00	3.69	3.69	0	Min of WRSE BAU or WRMP19 SR	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant

Table 5.8: Eastern Area - Kent Medway East (KME)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (MI/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
KME	Sheldwich	White Drain and Lakes	North Kent Swale Chalk	5	5	13.07	8.38	11.80	4.57	5.23	11.7	Min of WRSE DO, ND baseline rate	5.23	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KME	Capstone Chalk	Lower Medway	North Kent Medway Chalk	0	2	1.84	1.73	2.80	1.75	0.92	2.8	Min of WRSE DO, ND baseline rate	0.92	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KME	Capstone Lower Greensand	Lower Medway	Kent Greensand Middle	#N/A	#N/A	1.84	1.73	1.84	1.75	1.75	1.4	Confined Source, no change to DO/licence, No SW impacts	1.40	Confined Source, no change to DO/licence, No SW impacts	Not considered but growth not possible so implicitly licence capped	Not relevant

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Annex 9 Environmental Ambition. Protecting and Enhancing the Environment

KME	Sittingbourne 1	White Drain and Lakes	North Kent Swale Chalk	5	2	2.03	1.91	3.90	1.93	1.93	3.4	Min of WRSE DO, ND baseline rate	1.93	Min of ND baseline rate, WRSE Enhanced	Included in both scenarios	Not relevant
KME	Hartlip Hill	Lower Medway	North Kent Swale Chalk	0	2	2.84	2.68	2.40	2.70	2.70	2.4	Min of WRSE DO, ND baseline rate	2.40	Min of ND baseline rate, WRSE Enhanced	Included in both scenarios	Not relevant
KME	Sittingbourne 2	White Drain and Lakes	North Kent Swale Chalk	5	2	6.90	5.28	4.90	5.52	5.52	4.9	Min of WRSE DO, ND baseline rate	4.90	Min of ND baseline rate, WRSE Enhanced	Included in both scenarios	Not relevant
KME	Faversham 2	White Drain and Lakes	North Kent Swale Chalk	5	5	1.40	0.89	1.30	0.00	0.00	1.3	Limit to ND rate (note seasonal source)	0.00	WRSE enhanced (suggests no abstraction essentially)	Included under Central, Alternative goes further	Not relevant
KME	Faversham 1	White Drain and Lakes	North Kent Swale Chalk	5	5	1.22	0.79	1.20	0.00	0.00	1.2	Limit to ND rate (note seasonal source)	0.00	WRSE enhanced (suggests no abstraction essentially)	Included under Central, Alternative goes further	Not relevant
KME	Newington	White Drain and Lakes	North Kent Swale Chalk	5	2	2.44	0.96	0.80	0.97	0.97	0.8	Min of WRSE DO, ND baseline rate	0.80	Min of ND baseline rate, WRSE Enhanced	Included in both scenarios	Not relevant
KME	Lomas Road	White Drain and Lakes	North Kent Swale Chalk	5	#N/A	3.25	0.00	0.00	0.00	0.00	0	Source Abandoned, no licence	0.00	Source Abandoned, no licence	Licence to be revoked so licence cap implicitly met	Not relevant

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		Lakes	Chalk													
KME	London Road	White Drain and Lakes	North Kent Swale Chalk	5	#N/A	3.25	0.00	0.00	0.00	0.00	0	Source Abandoned, no licence	0.00	Source Abandoned, no licence	Licence to be revoked so licence cap implicitly met	Not relevant
KME	Gillingham	Lower Medway	North Kent Medway Chalk	0	2	1.84	1.73	6.20	1.75	1.75	6.2	Min of WRSE DO, ND baseline rate	1.75	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KME	Hartlip	Lower Medway	North Kent Swale Chalk	0	2	11.37	9.08	12.00	9.09	9.09	12	Min of WRSE DO, ND baseline rate	9.09	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KME	Chatham West	Lower Medway	North Kent Medway Chalk	0	2	1.84	1.66	2.80	1.75	1.75	2.8	Min of WRSE DO, ND baseline rate	1.75	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KME	Rainham Mark	Lower Medway	North Kent Medway Chalk	0	#N/A	1.84	1.73	0.00	1.84	1.84	0	Source Abandoned, Revoke	0.00	Source Abandoned, Revoke	Licence to be revoked so licence cap implicitly met	Not relevant
KME	Faversham 4	White Drain and Lakes	White Drain	5	8	10.96	7.02	11.30	0.00	0.00	0	Min of WRSE BAU+, WRSE DO, ND Baseline rate (to meet area EFI reduction)	0.00	Min of ND baseline rate, WRSE Enhanced	Goes further to meet EFI target	Not relevant

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												target for White Drain)				
KME	Sheerness East	White Drain and Lakes	North Kent Swale Chalk	5	#N/A	1.83	0.06	0.00	0.09	0.00	0	Source Abandoned, no licence	0.00	Source Abandoned, Revoke	Licence to be revoked so licence cap implicitly met	Not relevant
KME	Chatham	Lower Medway	North Kent Medway Chalk	0	2	1.84	1.73	3.40	1.75	1.75	3.4	Min of WRSE DO, ND baseline rate	1.75	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KME	Faversham 3	White Drain and Lakes	North Kent Swale Chalk	5	5	10.07	6.46	6.40	0.00	0.00	6.4	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KME	Tonge	White Drain and Lakes	North Kent Swale Chalk	5	#N/A	3.25	0.00	0.00	0.00	0.00	0	Source Abandoned, no licence	0.00	Source Abandoned, Revoke	Licence to be revoked so licence cap implicitly met	Not relevant
KME	Millstead	White Drain and Lakes	North Kent Swale Chalk	5	2	2.03	0.93	1.40	1.01	0.81	1.37	Min of WRSE DO, ND baseline rate	0.81	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant

Table 5.9: Eastern Area - Kent Thanet (KT)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
KT	Deal	North and South Streams	North and South Streams at Northbourne	4	8	6.23	0.00	2.50	0.00	0.00	2.5	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KT	West Sandwich	Little Stour and Wingham	Wingham and Little Stour	4	8	9.34	6.82	7.00	4.67	4.67	4.671	Min of WRSE BAU+, WRMP19 DO, ND Baseline rate (to meet area EA reduction target for Little Stour and Wingham)	4.67	Min of ND baseline rate, WRSE Enhanced	Goes further to meet EFI target	Not relevant
KT	Manston2	Stour Marshes	Monkton and Minster Marshes	0	3	4.34	1.55	0.40	0.00	0.00	0.4	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate,	Included under Central, Alternative goes further	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
													WRSE Enhanced			
KT	West Langdon	North and South Streams	North and South Streams at Northbourne	4	8	9.09	4.56	5.50	0.91	1.36	4.7	Min of WRSE DO, ND baseline rate	1.36	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KT	North Dover	North and South Streams	North and South Streams at Northbourne	4	8	2.18	0.82	0.90	0.87	0.00	0.9	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KT	Ramsgate A	Stour Marshes	East Kent Chalk	0	#N/A	5.49	0.00	0.00	1.92	5.49	0	Revoke, no DO	0.00	Revoke, no DO	Licence to be revoked so licence cap implicitly met	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
KT	Ramsgate B	Stour Marshes	East Kent Chalk	0	3	6.84	4.41	4.30	1.71	0.00	3.2	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Goes further to meet EFI target	Not relevant
KT	Stourmouth	Stour Marshes	Thanet Chalk	0	2	9.21	0.45	0.00	9.21	9.21	0	Revoke, no DO	0.00	Revoke, no DO	Licence to be revoked so licence cap implicitly met	Not relevant
KT	Kingsdown	North and South Streams	North and South Streams at Northbourne	4	8	3.64	3.00	3.10	2.00	0.00	3.1	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KT	Broadstairs	Stour Marshes	Thanet Chalk	0	#N/A	0.00	0.00	0.00	0.00	0.00	0	Revoke, no DO	0.00	Revoke, no DO	Licence to be revoked so licence cap implicitly met	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (M/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
KT	Birchington	Stour Marshes	Thanet Chalk	0	2	3.88	1.39	1.70	0.00	0.00	1.7	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Goes further to meet EFI target	Not relevant
KT	North Deal	North and South Streams	North and South Streams at Northbourne	4	8	6.84	3.16	3.80	0.00	0.00	3.8	Min of WRSE DO, ND baseline rate	0.00	Min of ND baseline rate, WRSE Enhanced	Included under Central, Alternative goes further	Not relevant
KT	Manston2	Stour Marshes	Thanet Chalk	0	#N/A	0.00	0.00	0.00	0.00	0.00	0	Revoke, no DO	0.00	Revoke, no DO	Licence to be revoked so licence cap implicitly met	Not relevant
KT	near Canterbury	Little Stour and Wingham	Wingham and Little Stour	4	8	25.01	12.33	14.20	5.00	2.50	5.0018	Min of WRSE BAU+, WRMP19 DO, ND Baseline rate (to meet area EA reduction target for Little Stour and Wingham)	2.50	Min of ND baseline rate, WRSE Enhanced	Goes further to meet EFI target	Not relevant

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (Ml/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
KT	Sandwich	Little Stour and Wingham	Wingham and Little Stour	4	8	2.49	1.57	2.10	1.62	1.62	1.61915	Min of WRSE BAU+, WRMP19 DO, ND Baseline rate (to meet area EA reduction target for Little Stour and Wingham)	1.62	Min of ND baseline rate, WRSE Enhanced	Goes further to meet EFI target	Not relevant

Table 5.10: Eastern Area - Sussex Hastings (SH)

WRZ	Source	Operational Catchment	Primary Affected waterbody	EA Prioritisation Score (Operational Catchment)	Source Prioritisation (Water Body)	Licence (WRSE info)	Future Predicted	ND Baseline Rate (MI/d)	Proposed Licence		BVP Central Scenario		BVP Alternative Scenario		Other considerations	
									BAU+	Enhanced	Proposed Licence	Rationale	Proposed Licence	Rationale	Licence Capping	CSMG
SH	Rye	Brede and Tillingham	AP3, Winchelsea - River Breede	4	#N/A	5.01	1.30	0.38	3.99	3.99	5.007	Operational catchments without any reductions identified (in the national modelling)	1.23	1.20	Not applied	Not relevant
SH	Cadborough	Brede and Tillingham	#N/A	4	#N/A	1.00	0.12	0.00	1.00	0.30	0	Revoke, no DO		0.00	Licence to be revoked so licence cap implicitly met	Not relevant
SH	Darwell	Rother Levels	Glottenham Stream	1	1	45.60	20.09	21.14	45.60	45.60	45.604	Operational catchments without any reductions identified (in the national modelling)	15.98	29.59	Not applied	Not relevant
SH	Powdermill	Brede and Tillingham	Brede	4	2	7.47	3.03	2.73	6.73	6.73	7.473	Operational catchments without any reductions identified (in the national modelling)	4.20	5.94	Not applied	Not relevant

# Appendix C Water Resource Zone level reductions

Figures 4.1 – 4.14 show the deployable output reduction for each Water Resource Zone for each of the relabelled scenarios ('High', 'Medium' or 'Low').

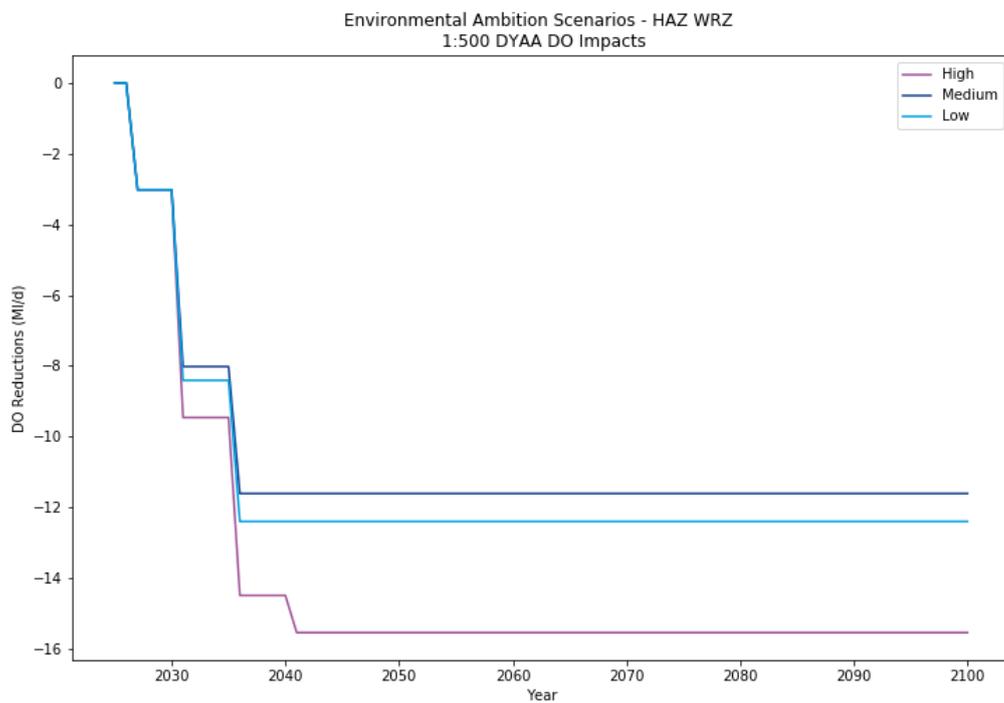


Figure 4.1: Reduction for Hampshire Andover (HAZ) across planning horizon

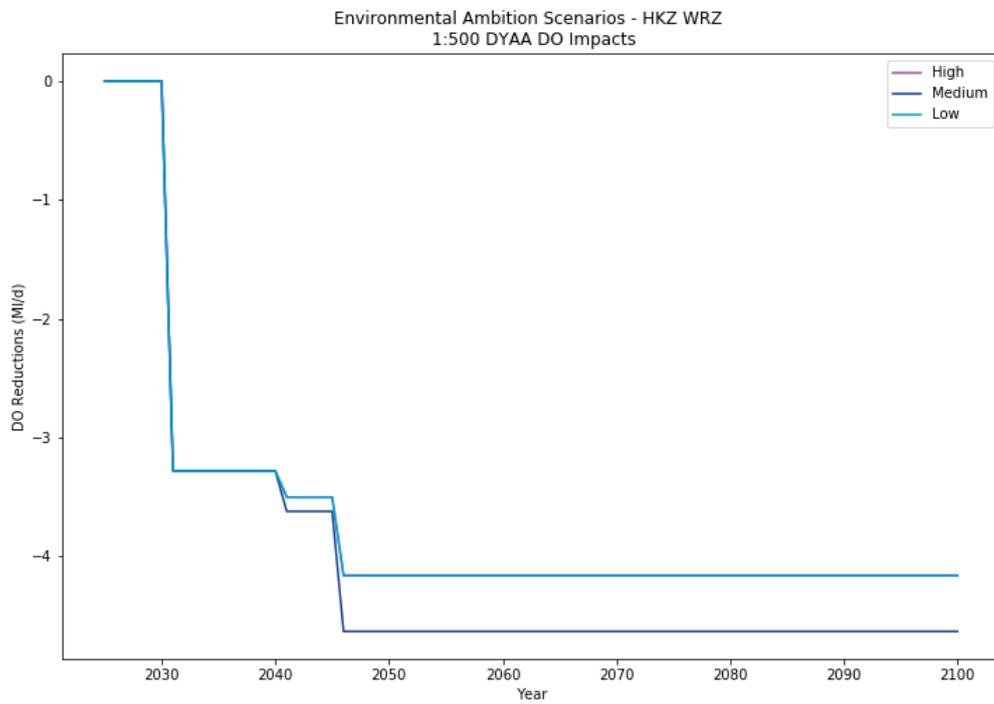


Figure 4.2: Reduction for Hampshire Kingsclere (HKZ) across planning horizon

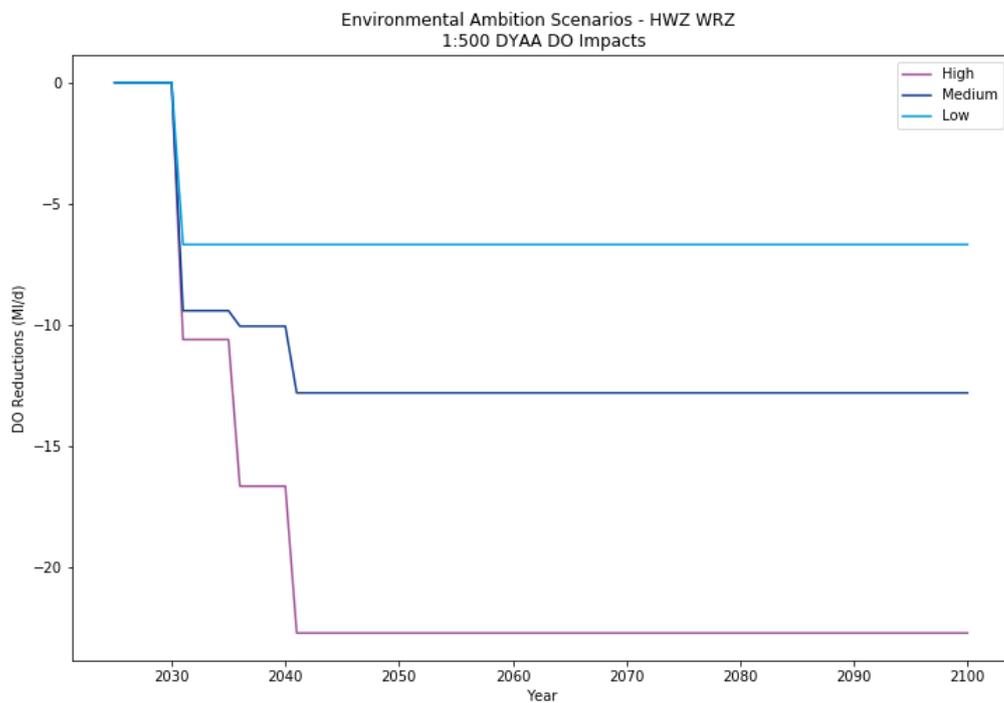


Figure 4.3: Reduction for Hampshire Winchester (HWZ) across planning horizon

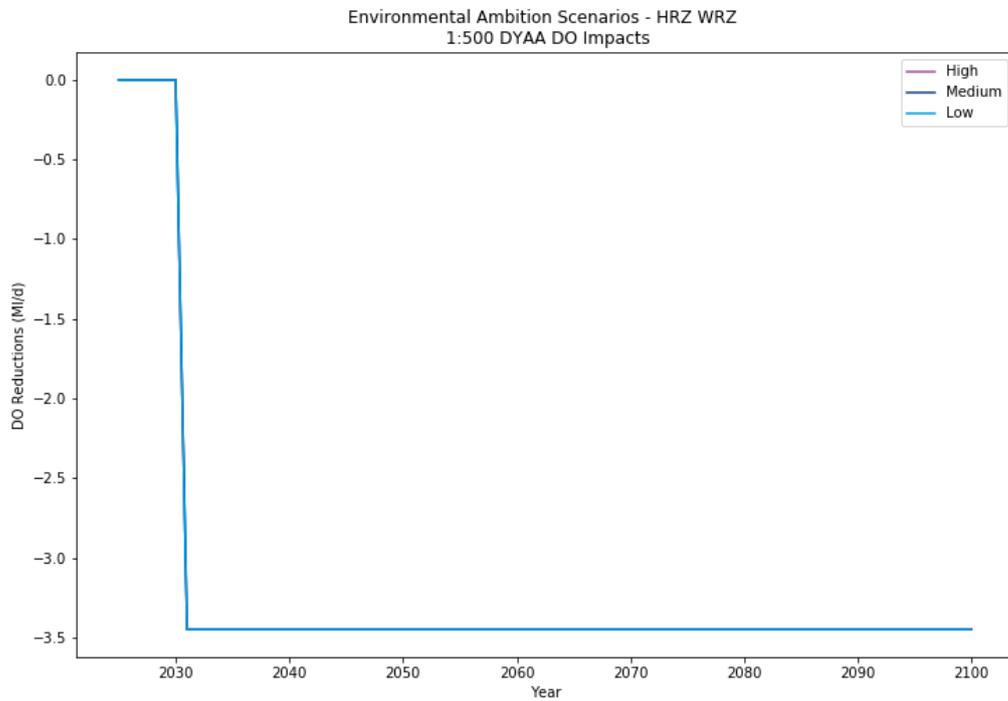


Figure 4.4: Reduction for Hampshire Rural (HRZ) across planning horizon

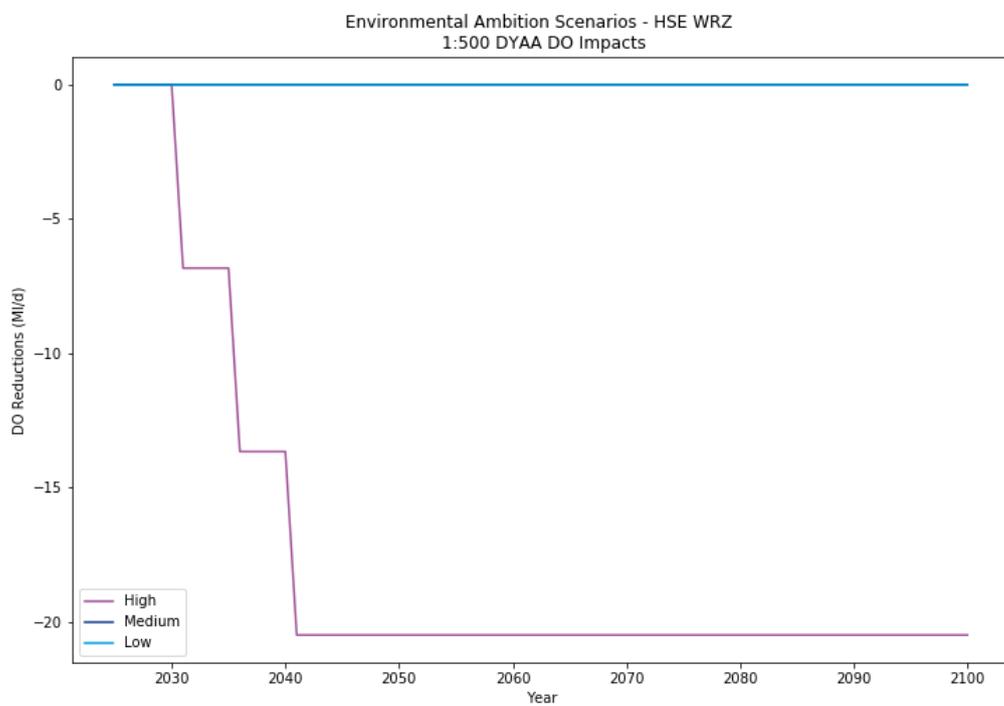


Figure 4.5: Reduction for Hampshire Southampton East (HSE) across planning horizon

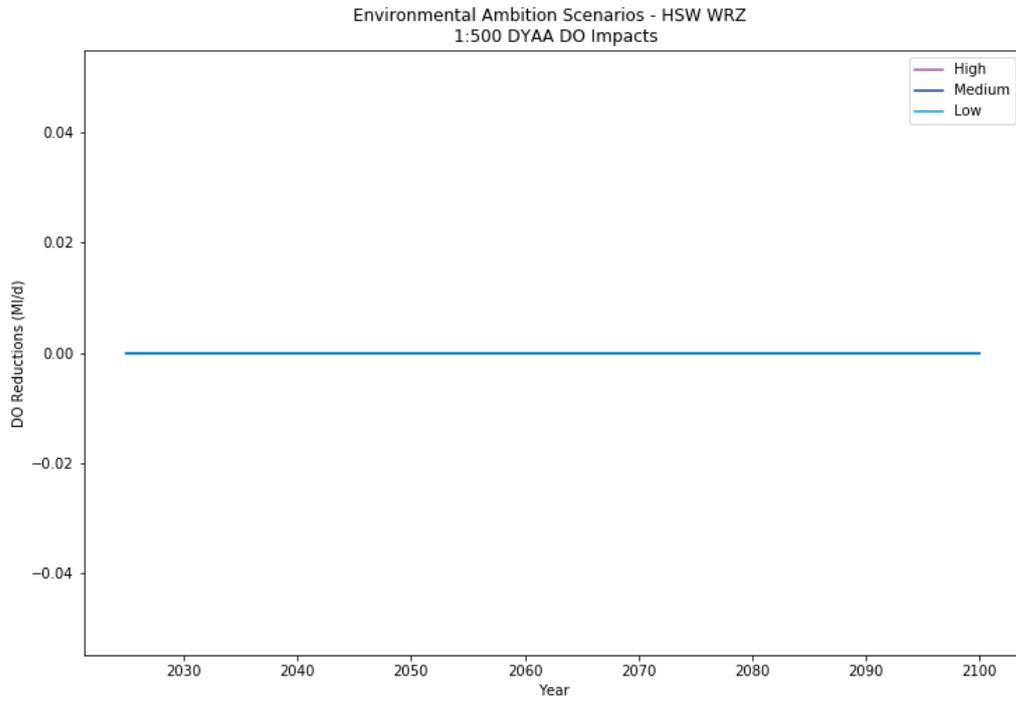


Figure 4.6: Reduction for Hampshire Southampton West (HSW) across planning horizon

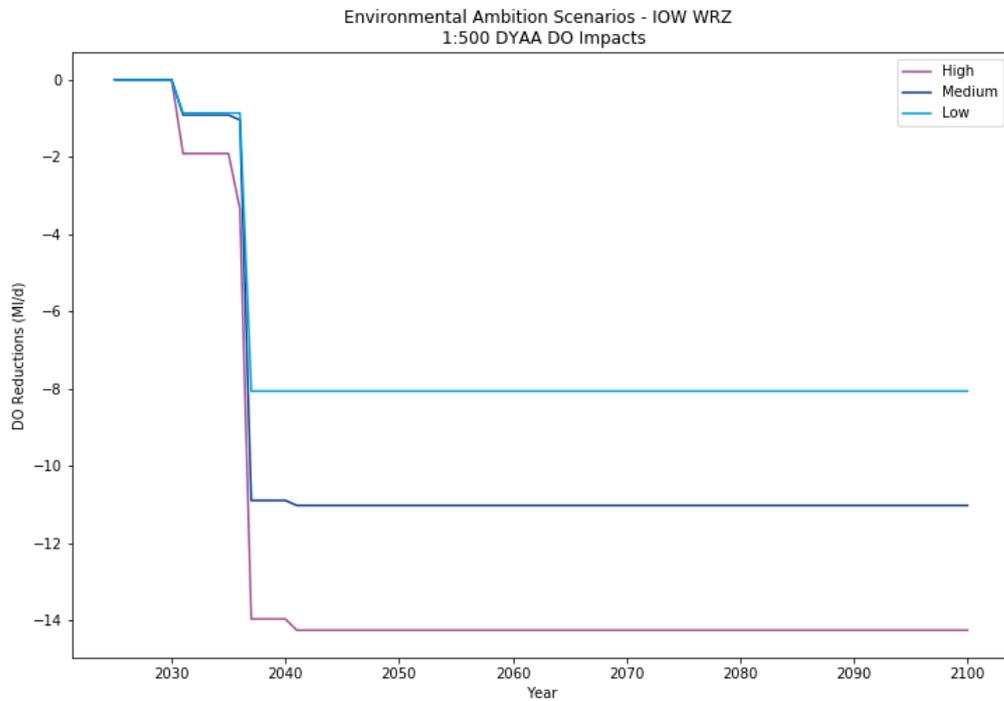


Figure 4.7: Reduction for Isle of Wight (IoW) across planning horizon

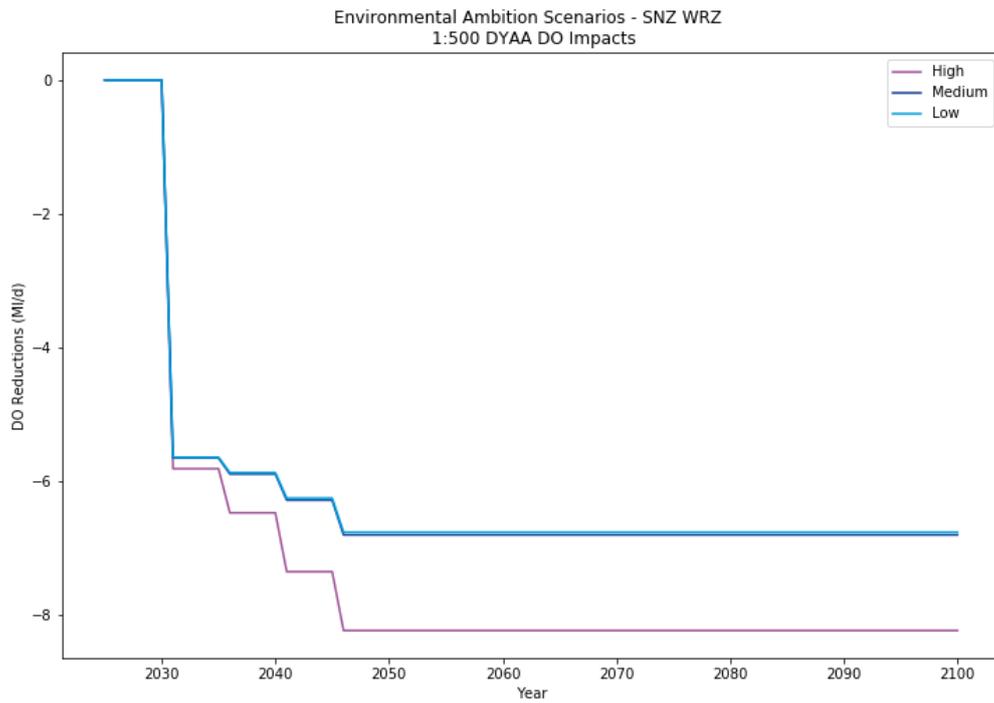


Figure 4.8: Reduction for Sussex North (SNZ) across planning horizon

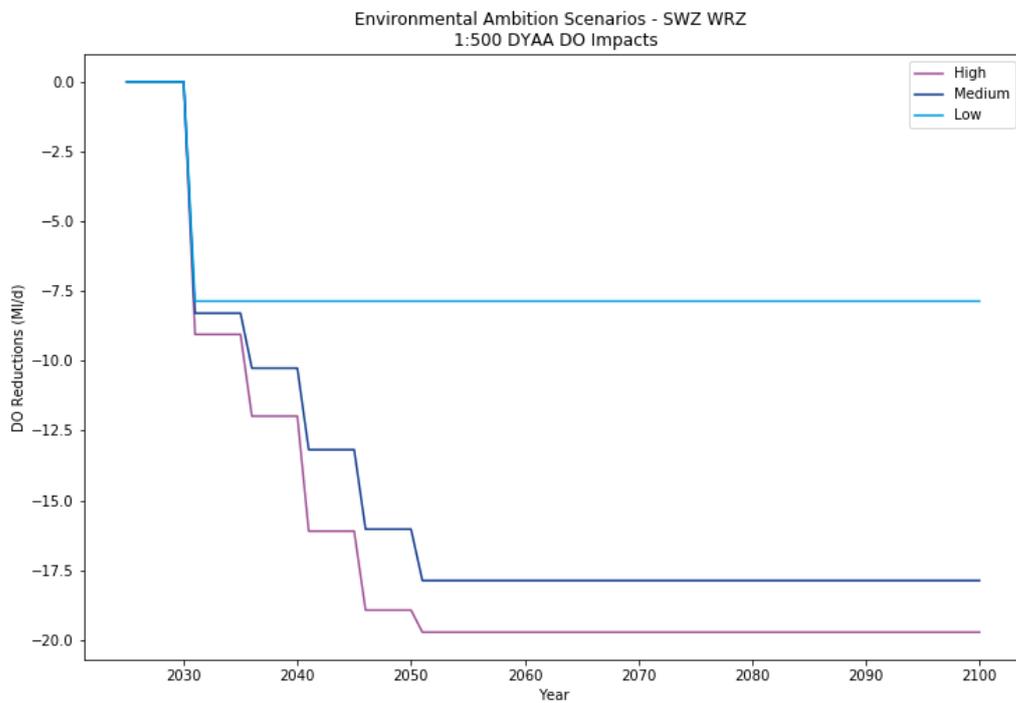


Figure 4.9: Reduction for Sussex Worthing (SWZ) across planning horizon

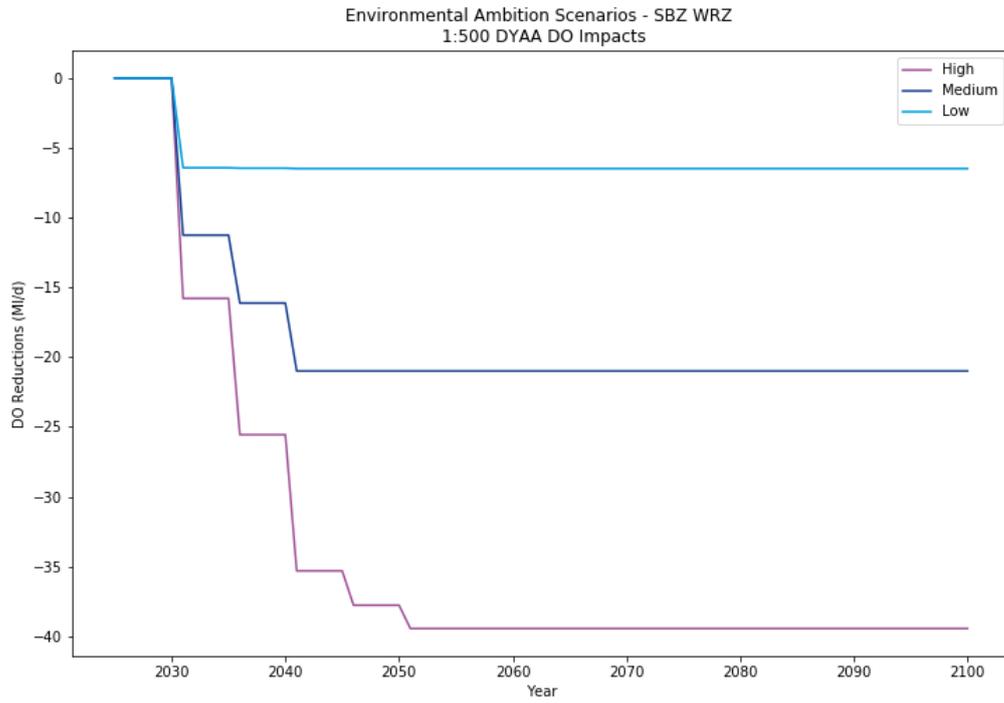


Figure 4.10: Reduction for Sussex Brighton (SBZ) across planning horizon

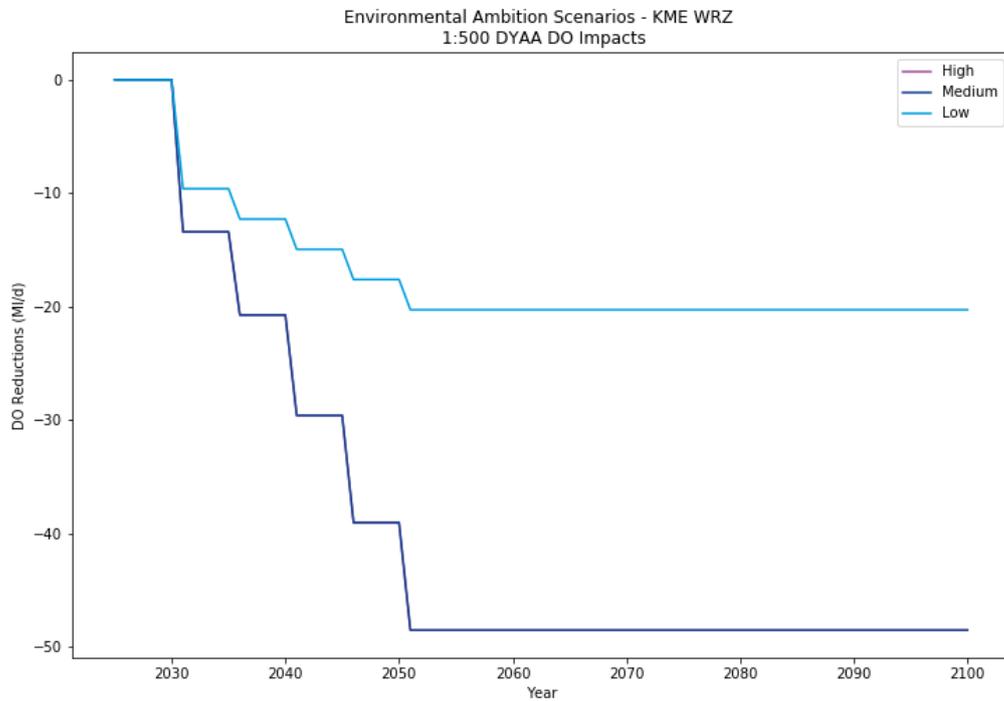


Figure 4.11: Reduction for Kent Medway East (KME) across planning horizon

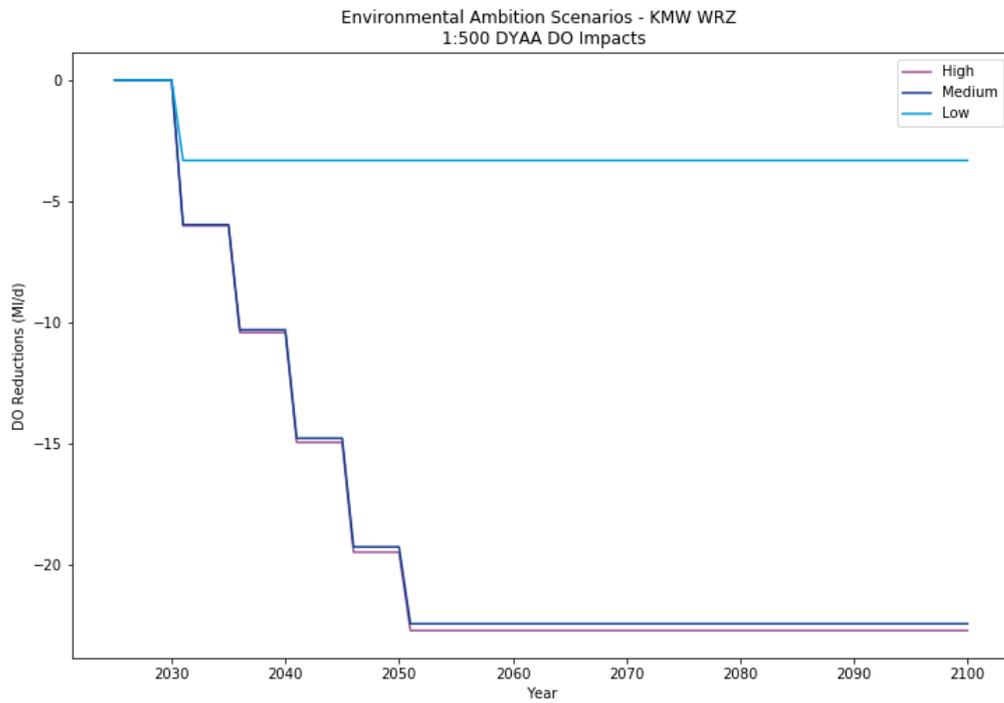


Figure 4.12: Reduction for Kent Medway West (KMW) across planning horizon

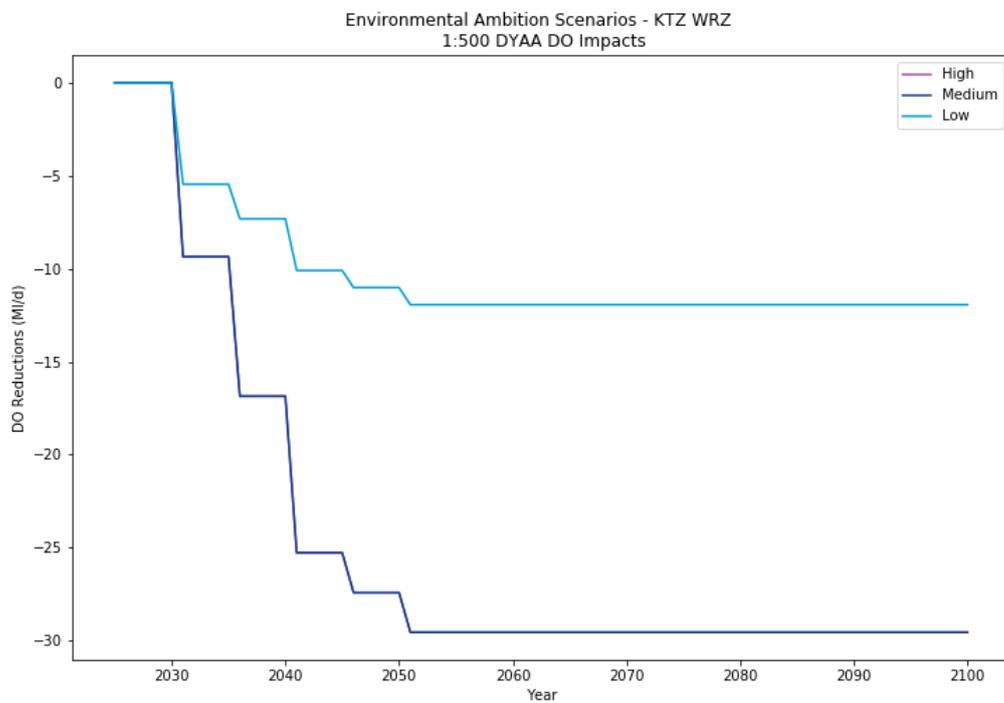


Figure 4.13: Reduction for Kent Thanet (KTZ) across planning horizon

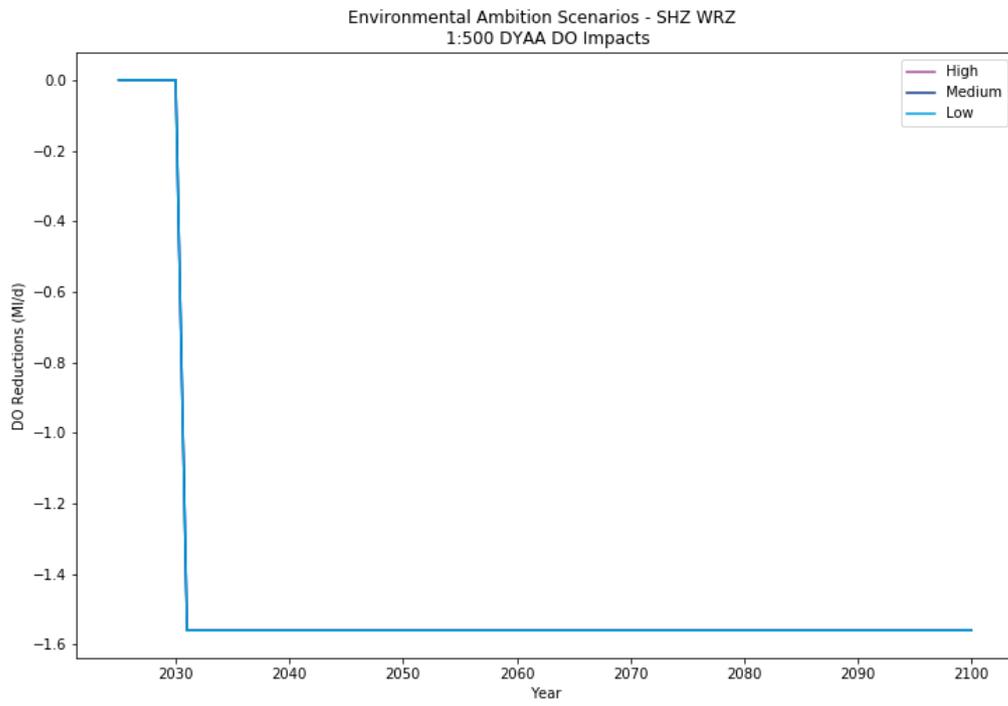


Figure 4.14: Reduction for Sussex Hastings (SHZ) across planning horizon

