

Draft Water Resource Management Plan 2024 Annex 19: Water Framework Directive Assessment Report

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from
**Southern
Water** 

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1. Introduction

Southern Water Services (Southern Water) is preparing its next Water Resource Management Plan (WRMP24). The WRMP sets out how the balance between water supply and demand, and security of supply, will be maintained over a minimum of 25 years in a way that is economically, socially and environmentally sustainable. WRMPs are reviewed on a rolling five-year basis, the most recent being published in 2019.

WRMPs must comply with international, UK and national legislation pertaining to the environment, as well as associated guidance on the development of WRMPs. The regulatory environmental assessment of the Southern Water WRMP24 will include the following:

- Strategic Environmental Assessment (SEA)¹;
- Habitats Regulations Assessment (HRA)²; and
- Water Framework Directive (WFD)³ assessment.

The Water Framework Directive (2000/60/EC) is an EU Directive establishing a framework for Community action in the field of water policy which aims to protect and improve the water environment. The Directive was brought into UK law in 2003 and subsequently revoked by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 in England and Wales. From this point forward “WFD” refers to the legislation applicable to England and Wales, not the EU Directive.

As part of preparing the draft WRMP24, Southern Water must demonstrate how it has considered the requirements of the WFD regulations. The current expectations are reflected (and articulated) in the latest 2022 national Water Resource Planning Guidance⁴ (WRPG), the WRPG Supplementary Guidance⁵ and the UKWIR guidance⁶ on environmental assessments for WRMPs and Drought Plans, both of which were updated in 2021. In addition, the All Company Working Group (ACWG) involved in developing Strategic Resource Options⁷ (SROs) has published relevant assessment methodology to help ensure consistency in the assessments undertaken by individual water companies of their SROs, aligned to the RAPID gated process.

This report presents the findings of the WFD assessment for Southern Water’s WRMP24. Separate reports have been completed to address the SEA and HRA requirements.

1.1. Water Resource Management Plans

Each water company’s WRMP sets out how the balance between water supply and demand, and security of supply, will be maintained over a minimum of 25 years in a way that is economically, socially and

¹ UK Government (2004) Statutory Instrument No.1633 - The Environmental Assessment of Plans and Programmes Regulations 2004

² UK Government (2017) Statutory Instrument No. 2010/490 Conservation of Habitats and Species Regulations 2017

³ Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy and the Water Environment (WFD) (England and Wales) Regulations 2017

⁴ Ofwat, NRW & EA (2022), Water Resources Planning Guideline – Updated 22 July 2022. Available at: <https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline>.

⁵ Environment Agency (2022) *Water resources planning guideline supplementary guidance – Environment and society in decision-making* (External guidance: Version 2, Dated: 03 March 2022)

⁶ UKWIR (2021) *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans*. UK Water Industry Research Limited, London.

⁷ The Strategic Water Resource Options (SROs) programme has been initiated by Ofwat to provide at least 1500MI/d of water to areas of England facing a water deficit. The SRO Programme includes 17 schemes which will be funded and assessed during AMP7 to determine the right portfolio of projects to be selected by Regional Plans ready for implementation in AMP8. Schemes are evaluated at a series of decision points (Gates).

environmentally sustainable. This will include public water supply (PWS) and non-public water supply (non-PWS).

A supply-demand balance is used to identify those water resource zones⁸ (WRZs) in deficit over the lifetime of the plan (and so where additional water resources are required). The WRMP presents options for the resolution of the WRZ deficit. The plan process initially reviews as many potential solutions as possible (the ‘unconstrained list’ of options) to identify ‘feasible’ options for each WRZ which will contribute to meeting the supply demand deficit across the operational area.

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

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

The ‘feasible’ options are screened against criteria and options that were impractical or have unacceptable environmental or economic impacts were removed. This identifies a constrained list of options which are then subject to more detailed assessment. These are reviewed and considered through decision making tools to identify the preferred plan options that collectively comprise the proposed plan programme. In developing the preferred programme, consideration is given to alternative plan programmes (or pathways) developed in response to different scenarios, to resolve any supply deficits in relation to financial, environmental and social costing and, potentially, to facilitate water trading between companies.

Southern Water provides water supplies to just over 2.4 million customers across an area of 4,450km², extending from East Kent, through parts of Sussex, to Hampshire and the Isle of Wight in the west. The Southern Water region is divided into fourteen Water Resource Zones (WRZs) which are geographically separate and amalgamated into three larger, sub-regional areas (see **Figure 1**).

⁸ Ofwat, NRW & EA (2022), Water Resources Planning Guideline – Updated 22 July 2022

<https://www.gov.uk/government/publications/waterresources-planning-guideline/water-resources-planning-guideline>. Section 4.4. of the WRPG defines a water resource zone as “an area within which the sources of water and distribution of water to meet demand, is largely self-contained (with the exception of agreed bulk transfers)”.

Figure 1 Southern Water’s Supply Area



Water supplies are predominantly reliant on the transmission and storage of groundwater from the widespread chalk aquifer that underlies much of the region. This extends throughout parts of Kent, Sussex, Hampshire and the Isle of Wight; and makes up 70% of the total water supply. River abstractions account for 23% of the water supplies, most notably the Eastern Yar and Medina on the Isle of Wight, the Rivers Test and Itchen in Hampshire, the Western Rother and Arun in West Sussex, the River Eastern Rother and River Brede in East Sussex, and the River Teise, River Medway and Great Stour in Kent. Four surface water impounding reservoirs provide the remaining 7% of water supplies: Bewl Water, Darwell, Powdermill and Weir Wood. The total storage capacity of these four reservoirs amounts to 42,390MI. South East Water is entitled to 25% of the available supplies from the River Medway Scheme, which incorporates Bewl Water Reservoir.

Southern Water face challenges in its Western and Central Areas, as a result of implemented licence changes, and proposed further abstraction reductions to protect and enhance the environment. There are now limited opportunities to develop new ‘conventional’ sources of water such as abstraction from rivers or groundwater and instead Southern Water has provided an optimised programme of water efficiency, demand management and leakage reduction in conjunction with other sources of water.

Southern Water has identified that all of the 14 WRZs will be in deficit over the lifetime of the draft WRMP24, as follows:

Western Area – comprising the following seven WRZs:

- Hants Kingsclere (HK);
- Hants Andover (HA);
- Isle of Wight (IW);
- Hants Rural (HR);
- Hants Winchester (HW);
- Hants Southampton East (HSE);
- Hants Southampton West (HSW).

Central Area – comprising the following three WRZs:

- Sussex North (SN);
- Sussex Worthing (SW);
- Sussex Brighton (SB).

Eastern Area – comprising the following four WRZs:

- Kent Medway East (KME);
- Kent Medway West (KMW);
- Kent Thanet (KT);
- Sussex Hastings (SH).

Southern Water has identified some 300 constrained options. Following evaluation, 129 preferred options covering customer, efficiency and new sources of supply have been selected for inclusion in the best value draft WRMP24. These are reflected in the strategies for each area.

Western Area strategy

- Reducing consumption by household customers in order to reduce average per capita consumption to less than 110 litres per person per day across the company by 2050
- Leakage reduction: reduce leakage so as to achieve a minimum 50% reduction in leakage across the company by 2050
- Catchment First: implementing a catchment solution to improve environmental resilience
- Hampshire Water Transfer and Water Recycling Project (a Strategic Resource Option)
- Recycling water at Sandown Water Treatment Works
- Recycling water at Woolston Water Treatment Works
- River Test Managed Aquifer Recharge
- Newbury groundwater option
- Romsey groundwater option
- Newchurch groundwater option
- Bulk imports – both continuation of existing imports and new transfers from Portsmouth Water and Thames Water
- Drought Interventions (Temporary Use Bans and Non-Essential Use Bans) and Test Drought Permit/Order.

Central Area strategy

- Reducing consumption by household customers in order to reduce average per capita consumption to less than 110 litres per person per day across the company by 2050
- Leakage reduction: reduce leakage so as to achieve a minimum 50% reduction in leakage across the company by 2050
- Recycling at Littlehampton Water Treatment Works
- Recycling at Horsham Water Treatment Works
- Desalination on the Sussex Coast
- River Adur Offline Reservoir
- Pulborough groundwater option
- Western Rother licence change and water storage
- Bulk transfers – both continuation of existing import and new transfer from Portsmouth Water, SES Water and South East Water

- Drought Interventions (Temporary Use Bans and Non-Essential Use Bans) and Pulborough, North Arundel and East Worthing Drought Permit/Orders.

Eastern Area strategy

- Reducing consumption by household customers in order to reduce average per capita consumption to less than 110 litres per person per day across the company by 2050
- Leakage reduction: reduce leakage so as to achieve a minimum 50% reduction in leakage across the company by 2050
- Recycling at Medway Water Treatment Works
- Recycling at Hastings Water Treatment Works
- Desalination on the East Thanet Coast
- Desalination on the Thames Estuary
- Desalination on the Isle of Sheppey
- Recommissioning of Gravesend groundwater source
- Reconfiguration of Rye groundwater source
- Raising Bewl Reservoir
- Bulk transfers – both continuation of existing import and new transfer from Affinity Water and South East Water
- Drought Interventions (Temporary Use Bans and Non-Essential Use Bans) and River Medway Scheme and Sandwich Drought Permit/Orders.

In June 2022 Southern Water submitted an early draft WRMP24 submission to Defra as required by the WRMP Direction 2022. This was accompanied by a Technical Note that addressed the WFD requirements. Submission of the June draft WRMP24 enabled Southern Water to take on board some early feedback which has influenced the development of the plan and accompanying assessments.

This report is being issued as part of the evidence base to support the consultation on the draft WRMP24. The consultation will run from **XXX, 2022 – YYY 2023**. Following consultation, and within 26 weeks of consultation beginning, Southern Water will need to prepare a Statement of Response to the representations received. The revised draft WRMP24 will be sent to the Government, and if changes are likely to be significant, is likely to be subject to further assessment and consultation. Following direction from the Government, the final WRMP24 will be published and implemented accordingly (anticipated August 2023). Once the final WRMP24 has been published, the preferred options for managing water supply and demand contained in it will need to be implemented through specific projects. As part of this process, each project may be subject to further assessment to understand and manage its potential environmental and social impacts.

1.2. Relationship with Water Resources South East

National guidance⁹ requires alignment of water company WRMPs with the respective regional plan. In the case of Southern Water, the draft WRMP24 is being developed within the context of the Water Resources South East (WRSE) Regional Plan¹⁰. WRSE is a collaboration of the six¹¹ water companies that supply water in South East England. The Regional Plan looks beyond the boundaries of individual companies and identifies options that will deliver the most benefit across the region.

⁹ UK Government (2021) *Water Resource Planning Guidance* [online]. Available at: <https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline>.

¹⁰ WRSE (2022) Futureproofing our water supplies: A Consultation On Our Emerging Regional Plan For South East England. Available at: <https://wrse.uk.engage.mh.com/the-proposed-solution>.

¹¹ Affinity Water, Portsmouth Water, SES Water, South East Water, Southern Water and Thames Water

The interactions and the need for consistency between the regional plans and the WRMPs, and between regions has driven development of new approaches and methodologies in the preparation of water resources plans. In this regard, WRSE commissioned the development of a new integrated environmental appraisal process to provide a consistent framework for environmental assessments for WRMP24. The method¹² has been developed taking into account the guidance from the Environment Agency (EA) and uses an integrated approach covering SEA, HRA, WFD assessment, Natural Capital Assessment (NCA) and Biodiversity Net Gain (BNG). It was subject to consultation in 2020 and has been revised¹³.

The revised WRSE environmental assessment methodology provides the approach to assessment for water companies when undertaking their WRMP24 regulatory environmental assessments. In consequence, a large amount of the supporting information required for the WFD assessment of Southern Water's WRMP24 has been produced as part of the regional plan environmental assessment. The relationship was set out in a scoping technical note issued for consultation with the Environment Agency, Natural England and Historic England for 5 weeks from 21st February to 27th March 2022. Subsequently, the approach has been further refined and is detailed in **Section 4**.

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

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

2. The Water Framework Directive

The WFD's key objectives are general protection of aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water. All objectives are integrated for each river basin, and the last three to specific bodies of water that support special wetlands, are designated for drinking water abstraction, and bathing areas. Ecological protection should apply to all waters.

The environmental objectives of the WFD are the core of the UK legislation providing for long-term sustainable water management on the basis of a high level of protection of the aquatic environment. Within the directive Regulation 13 sets out the "environmental objectives" for natural surface and groundwater bodies, artificial, and heavily modified water bodies (HMWBs). Natural surface water bodies must, by 2015, aim to achieve good ecological and chemical status and groundwater bodies good quantitative and chemical status. Artificial and HMWBs must aim to achieve good ecological potential and good chemical status. Regulation 13 also sets out the principle of no deterioration, providing protection from the deterioration of water status/ potential.

Exemptions are defined within Regulations 16 to 19, outlining the conditions under which the achievement of good status or potential may be phased or not be achieved, or under which deterioration may be allowed. Regulation 16 to 19 describe these distinct conditions. In summary:

- **Regulation 16** allows an extension of the time limit so that good status or potential is, under certain conditions, achieved after 2015;
- **Regulation 17** allows the achievement of less stringent objectives under certain conditions;
- **Regulation 18** allows the temporary deterioration of status in case of natural causes or "force majeure";
- **Regulation 19** allows for deterioration of status or non-achievement of good status or potential under certain distinct conditions.

3. The WFD and WRMP

The requirements for a WFD assessment of a water company WRMP are outlined in the 2022 WRPG Section 8.2.2.2:

“River basin management plan (RBMP) and WFD regulations RBMPs and WFD regulations environmental objectives are a constraint on your options. You should screen out any options that have unacceptable environmental impacts that cannot be overcome. You should ensure that there is no risk of deterioration from a potential new abstraction or from increased abstraction at an existing source before you consider it as a feasible option. Alternatively if investigations are yet to be completed, you should set out what your alternative options would be should those investigations demonstrate that there will be an unacceptable environmental impact.

You should also assess new supply options against the RBMP measures and objectives for each water body and meet your obligations to avoid future deterioration. You should ensure that your feasible options do not compromise the achievement of RBMP objectives.

You should talk to the Environment Agency or Natural Resources Wales about any intended actions that may:

- *cause deterioration of status (or potential);*
- *prevent the achievement of the water body status objectives in RBMPs; or*
- *prevent the achievement of water body status (or potential) for new modifications.*

You should do this as soon as possible before developing your plan. You should make a clear statement in your plan about any potential impacts.”

These WRPG requirements reflect Defra’s Guiding Principles for Water Resources Planning (May 2016) which state that companies should take account of the government’s objectives for the environment including the “appropriate parts of the EU Water Framework Directive”. Defra also expects that companies will:

- Have regard to RBMPs and their objectives when making decisions that could affect the condition of the water environment;
- Ensure that current abstractions and operations, as well as future plans, support the achievement of environmental objectives and measures set out in RBMPs;
- Ensure plans:
 - prevent deterioration in water body status;
 - support the achievement of protected area and species objectives;
 - support the achievement of water body status objectives.
- Continue working with the Environment Agency to take a proportionate and evidence based approach to identify the changes needed to current abstraction licences to meet environmental requirements.

Both the WRPG and the Defra Guiding Principles refer to ensuring ‘no deterioration’ of water body status. A recent (2015) European Court of Justice (ECJ) ruling clarified that ‘no deterioration’ means a deterioration between a whole ‘status class’ (e.g. ‘good’, ‘moderate’, etc.) of one or more of the relevant ‘quality elements’ (e.g. biological, physico-chemical, etc.). This definition applies equally to Artificial Water Bodies and Heavily Modified Water Bodies in respect of the relevant quality elements that relate to the defined uses of these water bodies. The ECJ ruling further states that if the quality element concerned is already in the lowest class, any deterioration of that element constitutes a deterioration of the status.

4. WFD Assessment Approach

4.1. Objectives

The objectives of the WFD assessment are to demonstrate that the individual options and the plan as a whole will:

1. Prevent deterioration between WFD status class of any element in the waterbody as set out in WFD Regulation 13;
2. Prevent new impediments to attaining 'Good' WFD status or potential for the waterbody, or any assessed element, as set out in Regulation 13;
3. Ensure that the planned programme of measures to help attain the WFD objectives for the waterbody in the current cycle of RBMPs, are not compromised.

These objectives are used as a test of constraint, and assess if an option and the plan is compliant or non-compliant with the WFD. In addition, the following objectives will apply to the plan as a whole. These are considered as progressive objectives rather than tests of constraint and do not lead to WFD non-compliance if not achieved. These are as follows:

4. Assist in attaining the WFD objectives for the waterbodies in line with Regulation 13;
5. Assist in attaining the objectives associated with WFD protected areas in line with Regulation 13;
6. Reduce treatment needed to produce drinking water and look to work in partnership with others; promoting the requirements of Regulation 8.

Where objectives 1, 2 and/or 3 are not met by an option or the plan then, unless there is no reasonable alternative, that option or plan should not be progressed as the preferred plan without discussion with the relevant regulatory body. Discussion with the regulatory body will include:

- If a plan is reported as potentially WFD non-compliant it may be appropriate to consider an adaptive plan where it is considered that additional evidence to improve confidence in assessment and enhanced design could mitigate the potentially WFD non-compliant issues.
- Where a plan is assessed as WFD non-compliant, in circumstances where there is an over-riding public interest or the benefits of achieving the WFD Assessment Objectives are outweighed by benefits to human health, human safety or sustainable development there is scope to apply for a Regulation 19 exemption as to why these WFD Assessment Objectives are not achieved.

4.2. Methodology

The WFD Assessment comprises four stages to ensure a level of assessment proportionate to the risk posed by the options and the status of the options within the dWRMP (i.e. constrained or preferred options):

- Stage 1: Basic Screening of Options
- Stage 2: Detailed Impact Screening of Options
- Stage 3: Plan Level Assessment
- Stage 4: Cumulative Assessment with other Plans/Projects.

A description of the four Stages of assessment are provided in the following sections. For the October 2022 submission of the dWRMP, all Stages from 1 to 4 have been undertaken.

4.2.1. Stage 1: Basic Screening based on activities

The first stage of WFD assessment was initially completed by Mott Macdonald on behalf of Southern Water using the agreed WRSE Regional Plan methodology, and was used to inform the WFD assessment of the WRSE Emerging Regional Plan.

Stage 1 screening has been repeated at this stage for Southern Water’s preferred options to review the assessment against the latest option information, and to take into account previous regulator feedback.

The purpose of Stage 1 is to identify and ‘screen-out’ options and waterbodies with no or very minor potential impacts from further assessment (Stage 2), and focus further assessment effort on those options with the potential to be non-compliant with the WFD.

The Stage 1 assessment comprises a basic screening of all constrained and preferred options and follows the following steps for each option:

- Identification of the activities involved in construction, operation and decommissioning phases;
- Identification of the WFD waterbodies which these activities may affect, and collation of baseline WFD status for each waterbody;
- Each activity in each water body is assigned an impact score;
- Consideration of the embedded mitigation measures included in the option design, and assumed in the list of impact scores. Where appropriate, the impact score is revised to take account of additional or reduced embedded mitigation; and
- Calculation of the maximum impact score (i.e. the highest screening score from any one activity in any waterbody).

The Stage 1 assessment is undertaken using a spreadsheet too. The assessment spreadsheets for all constrained and preferred options are available on request.

The impact scores are a six-point scale ranging from -2 ‘very beneficial’ to 3 ‘high impact’, see **Table 1**. Options with a maximum impact score of two or higher are “screened-in” for the Stage 2 assessment, and considered, at this stage to be potentially non-compliant with the WFD.

Options with an impact score of one or less are not “screened-in” for Stage 2 assessment and are considered to be WFD compliant. This means that WFD compliance will not be a constraint on the implementation of the option. Embedded mitigation may be required, and further WFD investigation may be required at the time of implementation to design such mitigation, but that should be easily achieved within normal best practice for construction and operation.

Table 1 Impact scoring system for Stage 1 of the WFD assessment

Impact	Score	Description
Very beneficial	-2	Impacts that, taken on their own, have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody.
Beneficial	-1	Impacts that, when taken on their own, have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements.
No/minimal	0	No measurable change in the quality of the water environment or the ability for target WFD objectives to be achieved.
Low	1	Impacts that, when taken on their own, have the potential to lead to a minor localised, short-term and fully reversible effects on one or more of the quality elements but would not result in the lowering of WFD status. Impacts would be very unlikely to prevent any target WFD objectives from being achieved.
Medium	2	Impacts that, when taken on their own, have the potential to lead to a widespread or prolonged effect on the quality of the water environment. This may result in the temporary reduction in WFD status class (e.g., from good to moderate), or temporary deterioration within the lowest status class. Impacts have the potential to prevent target WFD objectives from being achieved.
High	3	Impacts when taken on their own have the potential to lead to a significant effect and permanent deterioration of WFD status class, or permanent deterioration within the lowest status class. Potential for high impact on preventing target WFD objectives from being achieved.



A summary of the outcomes from the Stage 1 assessments for all the constrained and preferred options is provided within **Section 5**.

4.2.2. Stage 2: Detailed Impact Screening

Options that are considered to be potentially non-compliant in Stage 1, and selected by Southern Water as preferred options, have been brought forward to Stage 2 assessment.

The Stage 2 assessment for each option comprises a waterbody scale assessment of impacts on each WFD quality element for each activity flagged as potentially non-compliant. Where appropriate, activities or quality elements are grouped where potential impacts are similar. The assessments are based on expert judgement, supported by the following:

- Baseline WFD data (status, objectives, reasons for not achieving good status);
- A review of the hydrological/hydrogeological setting;
- A review of the regulatory position on water availability as presented in the Environment Agency Abstraction Licensing Strategy datasets;
- Where available, a review of regulator concerns/comments on the options;
- Where available any exiting studies/knowledge of the options or water bodies in which they are located (e.g., WINEP investigations);
- Consideration of additional mitigation that could be implemented to limit or avoid impacts.

The Stage 2 impact screening has been undertaken on all water bodies that could potentially be impacted by an option. For example, for a new/increased surface water abstraction, the river water body in which the abstraction is located has been assessed, as well as any downstream water bodies which may be impacted by changes to the flow regime. For options which impact groundwater, the assessment also considers surface water bodies that may be hydraulically connected to the groundwater body in which the option is located.

The same numerical scale is used for the Stage 2 assessment as has been used in the Stage 1 assessments (i.e. **Table 1**). The Stage 1 impact scores have been reviewed and where appropriate revised based on the Stage 2 assessment. Where it is possible to lower the impact score to one or lower, the option is considered to be compliant with the WFD. Where the impact scores are unchanged or raised, the option is considered to be potentially non-compliant with the WFD.

A confidence level is assigned to the Stage 2 assessment, based on the quality and availability of both environment data and design information about the option at the time of assessment (see **Table 2**). Where the confidence levels are medium or low, the requirements for further data or design information to raise this confidence level are listed.

Where there is high confidence that an option is potentially non-compliant with the WFD Assessment Objectives, it should not be included as a preferred option, without more detailed impact assessment (this may include site specific data collection, bespoke modelling etc), and/or alternative options within the preferred plan should WFD compliance not be established. This will require discussion with the environmental regulators at an early stage as the option may pose a risk to the plan. A bespoke method for this detailed assessment will be produced on an ad-hoc basis if required. No preferred options have been assessed as potentially non-compliant (high confidence) however (see **Section 5**).

Table 2 Confidence levels used in Stage 2 assessment

Confidence level	Description
Low	Limited data and evidence available, based mainly or completely on expert judgement with many assumptions. Preliminary design information only, detailed information on location/routes, construction methods etc. not yet available.
Medium	Some data and evidence available, based partially on expert judgement with some assumptions Design progressed but some assumptions made on construction methods etc.
High	Lots of good data and evidence available, minimal assumptions Design advanced minimal assumptions needed.

4.2.3. Stage 3: Plan Level Assessment

A cumulative assessment of the preferred options has been undertaken to assess the WFD compliance of the preferred plan and any alternative plans. Where more than one option is located in the same groundwater body and/or in the same surface water catchment, there is the potential for cumulative impacts. This may occur even where the individual options have been assessed to be WFD compliant (e.g., the cumulative impact of multiple small river flow reductions in several tributaries of the same river). The preferred plan has been reviewed for both spatial and temporal cumulative impacts, using the same method and WFD objectives as the option level assessments.

4.2.4. Stage 4: Cumulative Assessment with other Plans/Projects

The preferred plan has been assessed for in combination impacts with WRMPs for other water companies, and the WRSE Regional Plan. This follows a similar process to the Stage 3 Plan Level Assessment.

4.2.5. Limitations and assumptions

The constrained and preferred options are still in the early stages of design development and therefore a precautionary approach has been exercised because of residual uncertainty. The WFD assessments have the following limitations and assumptions:

- The assessments refer to both 2015 and 2019 WFD baseline data. The 2015 WFD baseline status data are the current officially reported baseline in the 2015-2021 Cycle 2 RBMP. The third cycle of RBMP (RBMP3) is expected to be published later in 2022, however, it is our current understanding that the RBMP3 status, when published, will match the 2019 interim status as currently published. In the absence of the RBMP3 water body status, assessments have been undertaken against the RBMP2 status.
- The assessment assumes pipelines are underground (directionally drilled or pipe-jacked beneath any water courses) and therefore will not cross watercourses above ground or cause direct impacts.
- For canal transfer options, the assessment does not currently include structural changes to canals where these are used, although some modifications would likely be necessary. Modifications to canals would be unlikely to pose risk of deterioration to WFD status given their artificial nature but would need to consider future objectives and environmentally sensitive designs/mitigation to be integrated when design information becomes available.
- For effluent reuse options, it is assumed that the current discharge water quality would fail to meet Good status for at least some of the WFD water quality parameters in receiving waterbodies. At this stage the WFD risk assessment does not take into account additional treatment and retains a risk of

changes to physico-chemical conditions until further evidence is provided by treatment process design and water quality dispersion modelling.

- Assessment assumes fail safes / stop of transfer will be in place in the case of a significant failure of treatment.
- The geographical extent of the WFD assessment has been limited to waterbodies between the start point and end point of the option. For options which involve abstractions from or discharges to watercourses there is potential for some effects continuing downstream or upstream. These would become increasingly limited to 'negligible' with distance, but downstream and upstream waterbodies are considered in the Stage 2 assessments.
- Transfer operational requirements are unknown at this stage and the assessment has not accounted for seasonality or sweetening flows (e.g. with respect to flows in watercourses).

4.3. Consultation

Environment Agency (EA) comments were provided on the options in January 2021 after the initial Stage 1 WFD assessment of the constrained options was completed (see Section 5.1). Further comments were provided on the WRSE WFD assessment for the emerging Regional Plan in May 2022.

These comments have been considered and used to inform the assessments for this report.

5. Option-level WFD Assessment (Stage 1 and Stage 2)

5.1. Initial Constrained Options Stage 1 WFD assessment

288 constrained options were initially subjected to Stage 1 WFD assessment, completed by Mott Macdonald on behalf of Southern Water Services using the agreed WRSE Regional Plan methodology, and used to inform the WRSE Emerging Regional Plan.

The full results of this assessment are presented in **Appendix A**, including a summary broken down by Water Resource Zone (WRZ) / export option group. This allows review of the number of constrained options per WRZ, the number of constrained options initially screened in and out at Stage 1, and for constrained options screened in, the number of WFD waterbodies requiring further assessment at Stage 2 including waterbody ID(s) and name(s).

Of the 288 constrained options:

- 193 passed the initial Stage 1 WFD assessment and therefore are considered to be WFD compliant, and require no further WFD assessment for the dWRMP;
- The remaining 95 options were flagged as having the potential to adversely impact one or more WFD waterbodies during the construction or operation of the scheme. For these options further assessment is required to understand the implications of the scheme on WFD objectives and to identify whether mitigation is possible.
- In total there were 76 unique WFD waterbodies identified for the 95 options screened in as requiring further WFD assessment. Note that some WFD waterbodies are linked to more than one option.

5.2. Preferred Options Stage 1 and Stage 2 WFD assessment

Preferred Options included in the WFD Compliance Assessment

Of the 288 constrained options there are 129 options which have been selected as preferred options for inclusion in Southern Water's dWRMP24 for WRZs in deficit. These include,

- 7 demand management options which will not impact WFD status;
- 56 drought options identified in the emerging Drought Plan and assessed as part of the WFD assessment of that Plan (available from Southern Water). These comprise non-essential use bans which will not impact on WFD status and drought orders/permits subject to separate EARs.
- 66 supply-side preferred options that could potentially impact on WFD status. These include SROs that are also subject to separate WFD assessments.

The 7 demand management options and 56 drought options are listed with more detail in **Appendix B** for reference but are not included in this WFD assessment, to ensure consistency of approach across the parallel workstreams.

The 66 supply-side preferred options are the subject of this WFD compliance assessment. A number of these options are essentially phases of the same scheme. The majority of the preferred options are network solutions, designed to improve resilience and move water around the supply network. Other preferred options to increase Southern Water's water supply include:

- The Severn Thames Transfer (STT) and the Thames Southern Transfer (T2S);
- Havant Thicket reservoir;
- Various desalination schemes;
- Various wastewater recovery schemes;
- Other optimisations and borehole improvements.

WFD Compliance Assessment Outcomes

The results of the screening (Stage 1) and impact assessment (Stage 2) are given in full in **Appendix C** and **Appendix D**, and summarised in **Table 3**.

In summary, the list of preferred options assessed includes:

- 36 options that are anticipated to be Compliant with the WFD, and therefore require no further WFD assessment for the dWRMP;
- 30 options taken forward to Stage 2 for further assessment;
 - Of these, 19 options are anticipated to be potentially non-compliant (with low confidence). These options include some groundwater sources and a reservoir. They also include all of the desalination and effluent re-use schemes relating to the potential for impacts on water quality and, in some cases flow (where discharge is to a river).
 - 2 options are anticipated to be potentially non-compliant (with medium confidence). These options involve a change to the groundwater abstraction regime.

Compliance with WFD cannot be yet concluded for those options assessed as potentially non-compliant as detailed design information and data are not yet available. Therefore none of these options should not be excluded at this stage.

There are also a variety of options available from the wider pool of the constrained option list which passed the Stage 1 assessment. These are available for Southern Water to supply the deficit of the WRZ even if further assessment shows that some options are not compliant with the WFD because their impacts cannot be mitigated.

Comparison to Initial Constrained Options Stage 1 WFD assessment

The availability of updated option information has given rise to some differences in the latest WFD Stage 1 assessments.

- Some options have been taken forward to Stage 2 that had been previously screened out at Stage 1.
- One option involving a pipeline scheme has been re-assessed as Stage 1 compliant where it was previously anticipated to be potentially WFD non-compliant; SWS_SBZ_EF-TFR_REP_ALL_har2 res Transfer: Winter transfer Stage 2: New main Shoreham/North Shoreham and Brighton A (4MI/d).

In addition, the latest assessments have considered regulator feedback, including Environment Agency (EA) comments in January 2021 that identified nine constrained options that were initially screened out at Stage 1 for which further WFD assessment may be required. Of these nine options:

- Two are not taken forward as preferred options and therefore have not been re-assessed (Romsey - new boreholes to replace shallow adit; and Sandown WwTW Indirect Potable Reuse (Circa 5.2MI/d).
- The assessments for two options remain Compliant with the WFD at Stage 1:
 - SWS_KTZ_HI-TFR_KME_ALL_SFL Transfer: KTZ-KME (14MI/d), based on use of existing assets and continuation of a current option; and
 - SWS_HSE_EF-TFR_REP_ALL_pwc1 Import: PWC Import from Portsmouth Water (9MI/d). Based on this option as a pipeline scheme. It is assumed that the availability of the water resource will be assessed as part of Portsmouth Water's WRMP.
- The following four options have been taken through to Stage 2 assessment:
 - SWS_IOW_HI-REU_RE1_ALL_sey9 Recycling: Sandown WwTW (8.1MI/d);
 - SWS_IOW_HI-GRW_ALL_ALL_nw_gwa_kni_westi Groundwater: Newchurch LGS;
 - SWS_KTZ_HI-DES_ALL_ALL_tha20 Desalination: Desalination: East Thanet coast & transfer (20MI/d);

- SWS_SNZ_HI-REU_RE1_ALL_env_cu_chu2_conju Recycling: Horsham WTW conjunctive use with Arun Reservoir, Pulborough (6.8Ml/d).

Table 3 Summary of WFD Compliance Assessment of preferred options

Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
Bulk transfers within region (treated)	Import: PWC Import from Portsmouth Water (21MI/d)	SWS_HSE_HI-TFR_PRT_ALL_pwc2	Compliant (Stage 1)	-	Stage 1
Reclaimed water, water re-use, effluent re-use	Recycling: Hastings WTW to augment storage in Darwell reservoir (9.5MI/d)	SWS_SHZ_HI-REU_RE1_ALL_dar10	Potentially non-compliant (low conf.)	A new discharge (treated effluent) into the reservoir could potentially change the physico-chemistry of the water body, for example by increasing nutrient concentrations, changing dissolved oxygen concentrations, and changing water temperature, and could impact biological status elements. Further assessment is therefore required to consider the final characteristics of the new discharge and ensure that water quality is not compromised. Although considered unlikely, there is potential for any changes in water quality to affect dissolved oxygen and water temperature downstream of the reservoir. Furthermore, the installation of new discharge infrastructure and increase in inflow to the lake could potentially alter the hydromorphology of the water body and change aquatic habitats.	Stage 2
Desalination	Desalination: Sussex Coast (Modular 0-10MI/d) (10MI/d)	SWS_SBZ_HI-DES_ALL_ALL_shom10	Potentially non-compliant (low conf.)	The discharge of hypersaline water into the coastal water body could impact on water quality and affect biological elements. Water quality modelling will be required to determine the potential effects on biological compliance parameters and protected areas. Whilst fish is not a parameter monitored under coastal water bodies, the potential impacts on fish resulting from a plume of hypersaline water could give rise to an impact on nearby transitional water bodies, e.g. by creating a barrier to population movements.	Stage 2
Desalination	Desalination: Sussex Coast (Modular 10-20MI/d) (10MI/d)	SWS_SBZ_HI-DES_ALL_ALL_shom20	Potentially non-compliant (low conf.)	The discharge of hypersaline water into the coastal water body could impact on water quality and affect biological elements. Water quality modelling will be required to determine the potential effects on biological compliance parameters and protected areas. Whilst fish is not a parameter monitored under coastal water bodies, the potential impacts on fish resulting from a plume of hypersaline water could give rise to an impact on nearby transitional water bodies, e.g. by creating a barrier to population movements.	Stage 2
Desalination	Desalination: Sussex Coast (Modular 10-20MI/d) (40MI/d)	SWS_SBZ_HI-DES_ALL_ALL_shom40	Potentially non-compliant (low conf.)	The discharge of hypersaline water into the coastal water body could impact on water quality and affect biological elements. Water quality modelling will be required to determine the potential effects on biological compliance parameters and protected areas. Whilst fish is not a	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				parameter monitored under coastal water bodies, the potential impacts on fish resulting from a plume of hypersaline water could give rise to an impact on nearby transitional water bodies, e.g. by creating a barrier to population movements.	
Desalination	Desalination: East Thanet coast & transfer (10MI/d) Phase 2	SWS_KTZ_HI-DES_ALL_ALL_tha10_p2	Potentially non-compliant (low conf.)	The discharge of hypersaline water into the coastal water body could impact on water quality and affect biological elements. Water quality modelling will be required to determine the potential effects on biological compliance parameters and protected areas. Whilst fish is not a parameter monitored under coastal water bodies, the potential impacts on fish resulting from a plume of hypersaline water could give rise to an impact on nearby transitional water bodies, e.g. by creating a barrier to population movements. Construction of new infrastructure to support this option could impact on both water quality and biology if significant seabed disturbance is required. Sediment sampling will be required to confirm whether there is sufficient risk to water quality to affect biological parameters.	Stage 2
Desalination	Desalination: East Thanet coast & transfer (20MI/d)	SWS_KTZ_HI-DES_ALL_ALL_tha20	Potentially non-compliant (low conf.)	The discharge of hypersaline water into the coastal water body could impact on water quality and affect biological elements. Water quality modelling will be required to determine the potential effects on biological compliance parameters and protected areas. Whilst fish is not a parameter monitored under coastal water bodies, the potential impacts on fish resulting from a plume of hypersaline water could give rise to an impact on nearby transitional water bodies, e.g. by creating a barrier to population movements. Construction of new infrastructure to support this option could impact on both water quality and biology if significant seabed disturbance is required. Sediment sampling will be required to confirm whether there is sufficient risk to water quality to affect biological parameters.	Stage 2
Desalination	Desalination: East Thanet coast & transfer (20MI/d) Phase 2	SWS_KTZ_HI-DES_ALL_ALL_tha20_p2	Potentially non-compliant (low conf.)	The discharge of hypersaline water into the coastal water body could impact on water quality and affect biological elements. Water quality modelling will be required to determine the potential effects on biological compliance parameters and protected areas. Whilst fish is not a parameter monitored under coastal water bodies, the potential impacts on fish resulting from a plume of hypersaline water could give rise to an impact on nearby transitional water bodies, e.g. by creating a barrier to population movements.	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				Construction of new infrastructure to support this option could impact on both water quality and biology if significant seabed disturbance is required. Sediment sampling will be required to confirm whether there is sufficient risk to water quality to affect biological parameters.	
Bulk transfers within region (treated)	Pulborough to Worthing: 30MI/d	SWS_SWZ_HI-TFR_SNZ_ALL_hardham-tenant p 30	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Transfer: Lower Itchen to Hampshire grid (reversible link HW-HA) (30MI/d)	SWS_HAZ_HI-TFR_HWZ_ALL_oan2	Compliant (Stage 1)	-	Stage 1
New reservoir	Storage: Raising Bawl by 0.4m (3MI/d)	SWS_KMW_HI-RSR_RE1_ALL_rab1	Potentially non-compliant (low conf.)	Increasing the height of dam wall will lead to flooding of new reaches of existing feeding streams. Changes to the hydrological regime, river continuity and morphological conditions due to change in water level and increased reservoir storage could impact fish and invertebrate populations, suitability of habitat change in species. Loss of riverine habitat in upstream feeder streams due to increased water level would lead to permanent impacts on WFD receptors as fluvial habitats would transition to lacustrine habitats. Reduction in flow upstream due to higher dam level, particularly during times of low flow, could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature), potentially causing a deterioration in status. Levels may be higher but flow rate lower (risk of stagnation). The option would not introduce new priority or priority hazardous chemicals but lower or stagnating flows could result in a reduction in dilution of chemicals already present in the reservoir tributaries, and potentially further deterioration in status.	Stage 2
Reclaimed water, water re-use, effluent re-use	Recycling: Sandown WwTW (8.1MI/d)	SWS_IOW_HI-REU_RE1_ALL_sey9	Potentially non-compliant (low conf.)	The new discharge could affect physico-chemistry, potentially including concentrations of dissolved oxygen and nutrients, and water temperature. Further investigations are required to determine whether any changes to physico-chemistry could result in impacts upon biological quality elements. Localised changes to hydromorphology could also occur, although these are considered unlikely to result in deterioration in water body status. The installation of new in-channel infrastructure to support the discharge could potentially reduce the effectiveness of measures that are in place to limit hard bank protection, and limit the future effectiveness of measures that	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				are not yet in place to improve the physical form and function of the waterbody.	
Bulk transfers within region (treated)	Transfer: Lower Itchen to Hampshire grid (reversible link HA-HK) (10MI/d)	SWS_HKZ_HI-TFR_HAZ_ALL_oan3	Compliant (Stage 1)	-	Stage 1
Bulk Transfer Agreement (Treated)	Import: PWC Import from Portsmouth Water (9MI/d)	SWS_HSE_EF-TFR_REP_ALL_pwc1	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Transfer: Hampshire grid (reversible link HSE-HW) (30MI/d)	SWS_HWZ_HI-TFR_HSE_CNO_oan1	Compliant (Stage 1)	-	Stage 1
New reservoir	Storage: River Adur offline Reservoir (19.5MI/d)	SWS_SNZ_HI-RSR_RE1_ALL_bla	Potentially non-compliant (low conf.)	Increase in abstraction may affect flow in nearby River Adur. Abstraction Licensing Strategy shows there is water available at Q95, Q70, Q50, Q30 and streams are discharge rich. Abstraction in discharge rich surface waters may not breach EFI. Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish and invertebrate populations. Reduction in flow, particularly during times of low flow, could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature), potentially causing a deterioration in status. The Catchment Data Explorer indicate that Phosphate contributions and poor DO are a key RNAG, flow reductions could exacerbate this issue. The option would not introduce new priority or priority hazardous chemicals but lower flows could result in a reduction in dilution of chemicals already present in the River Adur, and potentially further deterioration in status.	Stage 2
Bulk transfers within region (treated)	Transfer: Romsey Town & Broadlands valve (HSW to HRZ)	SWS_HRZ_HI-TFR_HSW_ALL_bro	Compliant (Stage 1)	-	Stage 1
Desalination	Desalination: Isle of Sheppey (10MI/d)	SWS_KME_HI-DES_ALL_ALL_ios10	Compliant (low conf.)	-	Stage 2
Desalination	Desalination: Isle of Sheppey (20MI/d)	SWS_KME_HI-DES_ALL_ALL_ios20	Compliant (low conf.)	-	Stage 2
Desalination	Desalination: Isle of Sheppey (20MI/d) Phase 2	SWS_KME_HI-DES_ALL_ALL_ios20_p2	Compliant (low conf.)	-	Stage 2
Increase water treatment works (WTW) efficiency	Transfer: Hardham winter transfer stage 1 - Provision of a permanent	SWS_SWZ_HI-LRE_ALL_ALL_har1	Compliant (Stage 1)	-	Stage 1

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
	sludge treatment facility at Pulborough WSW (2MI/d)				
Groundwater sources	Groundwater: Recommission Gravesend source (2.7MI/d)	SWS_KME_HI-GRW_ALL_ALL_nw_gwa_win_eastn	Potentially non-compliant (med. Conf.)	<p>Increase in recent actual abstraction within licence limits may affect flow in nearby Nunningham stream. Abstraction Licensing Strategy shows there is no water available at Q95 and Q70, however the groundwater unit Hastings Beds Cuckmere and Pevensy Levels has water availability. Restricted water available at Q50. Geology indicates likely high degree of continuity between groundwater and surface water due to the permeable nature of the solid and superficial geology, and the proximity of watercourses.</p> <p>Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish and invertebrate populations. Reduction in flow, particularly during times of low flow, could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature), potentially causing a deterioration in status. The Catchment Data Explorer (GB107041012610) indicates that phys-chem currently at high to poor status which might be put at risk of deterioration, and that Phosphate contributions is a key RNAG, flow reductions could exacerbate this issue. The option would not introduce new priority or priority hazardous chemicals but lower flows could result in a reduction in dilution of chemicals already present in the Nunningham Stream, and potentially further deterioration in status.</p> <p>Changed groundwater flow patterns due to the increased abstraction could potentially result in migration of pollutants, but given Chemical status is Good and no RNAG this is not considered to pose a significant risk to the chemical status. Increased abstraction. Increased abstraction will reduce the surplus in the water balance potentially leading to deterioration. The Pevensy Levels SAC/RAMSAR/SSSI GWDTE receives inflows of surface water from the Nunningham Stream and other streams downstream of the abstraction locations. Baseflow to the Nunningham Stream may reduce which will reduce inflow to the SAC.</p>	Stage 2
Reclaimed water, water re-use, effluent re-use	Recycling: Woolston WwTW (7.1MI/d)	SWS_HSE_HI-REU_RE1_ALL_wol8	Potentially non-compliant (low conf.)	The installation of new in-channel infrastructure to support the discharge could potentially result in localised changes to hydromorphology and the disturbance of existing habitats. Localised changes to hydromorphology could also occur as a	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				result of increased flows in the River Itchen. However, any effects are likely to be temporary and are unlikely to result in deterioration in water body status. The new discharge could affect physico-chemistry, potentially including concentrations of dissolved oxygen and nutrients, and water temperature. Further investigations are required to determine whether any changes to physico-chemistry could result in impacts upon biological quality elements.	
Groundwater sources	Groundwater: Romsey - new BHs (4.8MI/d)	SWS_HRZ_HI-GRW_ALL_ALL_nw_gwa_tim_westi	Compliant (low conf.)	-	Stage 2
Bulk transfers within region (treated)	Transfer: Sandy Lane Abbotswood (HSE-HRZ) (1.1MI/d)	SWS_HSE_HI-TFR_HRZ_ALL_sla	Compliant (Stage 1)	-	Stage 1
Increase water treatment works (WTW) capacity	Treatment capacity: Upgrade Lower Itchen WSW (30MI/d)	SWS_HSE_HI-ROC_WT1_ALL_cpy_ott_30	Compliant (Stage 1)	-	Stage 1
Import from Portsmouth Water	Import: PWC Import from Portsmouth Water (30MI/d)	SWS_HSE_EF-TFR_REP_ALL_pwg_res2	Compliant (Stage 1)	-	Stage 1
Extension of Bulk Transfer agreement - Import from Portsmouth Water	Import: PWC Import from Portsmouth Water to Moor Hill reservoir extension (30MI/d)	SWS_HSE_EF-TFR_REP_ALL_pwg_res2	Compliant (Stage 1)	-	Stage 1
Artificial Storage and Recovery wells (or Aquifer Storage and Recovery (ASR))	Groundwater: Test MAR (5.5MI/d)	SWS_HSW_HI-GRW_RE1_ALL_str_asr_tes_westi	Compliant (Stage 1)	-	Stage 1
Bulk transfers into region (treated)	Transfer: Romsey Town & Broadlands valve (HSW-HRZ) (3.1MI//d)	SWS_HRZ_HI-IMP_HSW_ALL_rob1	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Transfer: KTZ-KME (14MI/d)	SWS_KTZ_HI-TFR_KME_ALL_sfl	Compliant (Stage 1)	-	Stage 1
Reclaimed water, water re-use, effluent re-use	Recycling: Recharge of Havant Thicket reservoir from Portsmouth Harbour WTW and new WRP (60MI/d)	SWS_PWE_HI-REU_RE1_ALL_60toht v0.1	Potentially non-compliant (low conf.)	The installation of a new pipeline beneath the River Meon and the River Itchen could affect the hydromorphology and/or physico-chemistry of the waterbodies, and could also affect the biology that these elements support.	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				<p>Trenched crossing techniques could result in considerable disturbance to hydromorphology and biology, and could also release contaminants directly into the watercourse. Trenchless crossing techniques would avoid direct hydromorphological disturbance, but could change subsurface flows in the adjacent floodplain and release contaminants into the watercourse (e.g. through an accidental breakout of drilling fluids), thereby affecting biological parameters. Trenched crossing techniques could release contaminants directly into the watercourse. Trenchless crossing techniques could also release contaminants into the watercourse (e.g. through an accidental breakout of drilling fluids).</p> <p>Further investigations are required to develop crossing methods to minimise impacts and avoid deterioration in water body status. However, crossing the watercourse with a pipeline is unlikely to release the chemicals for which the water body is currently failing.</p>	
Groundwater sources	Groundwater: Rye reconfiguration (1.5MI/d)	SWS_SHZ_HI-GRW_ALL_ALL_ass_br_bre_eastn	Compliant (stage 1)	-	Stage 1
Reclaimed water, water re-use, effluent re-use	Recycling: Horsham WTW conjunctive use with Arun Reservoir, Pulborough (6.8MI/d)	SWS_SNZ_HI-REU_RE1_ALL_env_cu_chu2_conju	Potentially non-compliant (low conf.)	A reduction in discharges from the WwTW could potentially affect the physico-chemistry of the water body. Although nutrient reductions are likely to be positive given the ongoing impact of phosphate discharges from the water industry, there is potential for adverse impacts during periods of low flow, including a reduction in dissolved oxygen concentrations and an increase in water temperature (i.e. due to shallow, sluggish flows).	Stage 2
Bulk transfers into region (treated)	Import: PWC to Pulborough (15MI/d)	SWS_SNZ_HI-IMP_PRT_ALL_pwh	Compliant (Stage 1)	-	Stage 1
Bulk transfers into region (treated)	Transfer: Bi-directional transfer (SWZ-SNZ) (15MI/d)	SWS_SNZ_HI-IMP_SWZ_ALL_rrn	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Transfer: SWZ-SBZ v6 valve (17MI/d)	SWS_SBZ_HI-TFR_SWZ_ALL_v6b	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Transfer: SWZ-SBZ additional through v6 valve (13MI/d)	SWS_SBZ_HI-TFR_SWZ_ALL_v6b 2026	Compliant (Stage 1)	-	Stage 1
Desalination	Desalination: River Thames estuary (10MI/d)	SWS_KMW_HI-DES_ALL_ALL_swa10	Compliant (low conf.)	-	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
Desalination	Desalination: River Thames estuary (10MI/d) Phase 2	SWS_KMW_HI-DES_ALL_ALL_swa10_p2	Compliant (low conf.)	-	Stage 2
Desalination	Desalination: River Thames estuary (20MI/d)	SWS_KMW_HI-DES_ALL_ALL_swa20	Compliant (low conf.)	-	Stage 2
Desalination	Desalination: River Thames estuary (20MI/d)	SWS_KMW_HI-DES_ALL_ALL_swa20p2	Compliant (low conf.)	-	Stage 2
Increase water treatment works (WTW) capacity	Treatment capacity: Upgrade Lower Test WSW (60MI/d)	SWS_HSW_HI-ROC_WT1_ALL_cpy_tst_60	Compliant (Stage 1)	-	Stage 1
Groundwater sources	Groundwater: Newchurch LGS	SWS_IOW_HI-GRW_ALL_ALL_nw_gwa_kni_westi	Potentially non-compliant (low conf.)	<p>Increase in recent actual abstraction within licence limits may affect flow in nearby stream discharging to the River Rother. Abstraction Licensing Strategy for the surface waterbody shows there is no water available at Q95 and Q70. Restricted water available at Q50. The groundwater has restricted water availability.</p> <p>Geology indicates likely high degree of continuity between groundwater and surface water due to the permeable nature of the solid and superficial geology, and the proximity of watercourses.</p> <p>Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish and invertebrate populations. Reduction in flow, particularly during times of low flow, could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature), potentially causing a deterioration in status. The Catchment Data Explorer indicate that phys-chem currently at good or high status which might be put at risk of deterioration. The option would not introduce new priority or priority hazardous chemicals but lower flows could result in a reduction in dilution of chemicals already present in the River Yar, and potentially further deterioration in status. Increased abstraction will reduce the surplus in the water balance potentially leading to deterioration. Changed groundwater flow patterns due to the increased abstraction could potentially result in migration of pollutants, but given Chemical status is Good and no RNAG this is not considered to pose a significant risk to the chemical status.</p> <p>The Alverstone Marshes GWDTE present in the vicinity of the abstraction locations which are likely to have good hydraulic</p>	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				connection to the groundwater body. Potential for some disconnection in the area due to overlying head and peat deposits containing clay.	
Desalination	Desalination: Tidal River Arun (10MI/d)	SWS_SWZ_HI-DES_ALL_ALL_aru10	Potentially non-compliant (low conf.)	The discharge of hypersaline water into the coastal water body could impact on water quality and affect biological elements. Water quality modelling will be required to determine the potential effects on biological compliance parameters and protected areas. Whilst fish is not a parameter monitored under coastal water bodies, the potential impacts on fish resulting from a plume of hypersaline water could give rise to an impact on nearby transitional water bodies, e.g. by creating a barrier to population movements.	Stage 2
Increase water treatment works (WTW) capacity	Groundwater: Newbury WSW (1.3MI/d)	SWS_HKZ_HI-ROC_ALL_ALL_ewo	Compliant (Stage 1)	-	Stage 1
Redevelopment of existing resources with increased yields	Groundwater: Petworth WSW return to service with a new borehole (4.0MI/d)	SWS_SNZ_HI-ROC_RE1_ALL_hsb-rcm	Potentially non-compliant (med. conf.)	<p>Increase in recent actual abstraction within licence limits may affect flow in nearby stream discharging to the River Rother. Abstraction Licensing Strategy for the surface waterbody shows there is no water available at Q95 and Q70. Restricted water available at Q50. The GWMU has restricted water availability. Geology indicates likely high degree of continuity between groundwater and surface water due to the permeable nature of the solid and superficial geology, and the proximity of watercourses. Increased abstraction will reduce the surplus in the water balance potentially leading to deterioration.</p> <p>Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish, invertebrate and macrophyte/phytobenthos populations. Reduction in flow, particularly during times of low flow, could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature), potentially causing a deterioration in status. The Catchment Data Explorer indicate that Phosphate contributions is a key RNAG (for GB107041012810 and GB107041012780) and DO is a key RNAG (for GB107041012780), flow reductions could exacerbate this issue.</p> <p>The option would not introduce new priority or priority hazardous chemicals but lower flows could result in a reduction in dilution of chemicals already present in the River Rother, and potentially further deterioration in status.</p>	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				Changed groundwater flow patterns due to the increased abstraction could potentially result in migration of pollutants, but given the RNAG is related to agriculture this is not considered to pose a significant risk to the chemical status.	
Groundwater sources	Groundwater: Eastern Yar3 replacement BH (1.5MI/d)	SWS_IOW_HI-GRW_ALL_ALL_br_less	Potentially non-compliant (low conf.)	<p>Increase in abstraction may affect flow in Wroxall Stream. Abstraction Licensing Strategy shows there is no water available at Q95, Q70, Q50, Q30 meaning flows are already lower than the requirement to support GES. The groundwater has restricted water availability. Geology indicates likely high degree of continuity between groundwater and surface water due to the permeable nature of the solid and superficial geology, and the proximity of watercourses. Hydrological regime currently does not support Good status. Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish and invertebrate populations. Reduction in flow, particularly during times of low flow, could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature), potentially causing a deterioration in status. The Catchment Data Explorer (GB107101006210) indicate that Phosphate contributions are a key RNAG, flow reductions could exacerbate this issue.</p> <p>The option would not introduce new priority or priority hazardous chemicals but lower flows could result in a reduction in dilution of chemicals already present in the Wroxall Stream, and potentially further deterioration in status. Increased abstraction will reduce the surplus in the water balance potentially leading to deterioration. Changed groundwater flow patterns due to the increased abstraction could potentially result in migration of pollutants, but given Chemical status is Good and no RNAG this is not considered to pose a significant risk to the chemical status.</p>	Stage 2
Bulk transfers within region (treated)	Import: SEW Kingston to KTZ Near Canterbury (2MI/d)	SWS_KTZ_HI-TFR_RZ8_ALL_win	Compliant (Stage 1)	-	Stage 1
Reclaimed water, water re-use, effluent re-use	Recycling: Medway WwTW (12.8MI/d)	SWS_KMW_HI-REU_RE1_ALL_ecc18	Potentially non-compliant (low conf.)	The new discharge of treated effluent could potentially result in physico-chemical effects that could impact on biological status elements for example by increasing nutrient concentrations, changing dissolved oxygen concentrations, and changing water temperature. The water body has had previous issues due to phosphorus, as demonstrated by the current moderate status classification for phosphorous. This	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				could impact phytoplankton communities. Further assessment is therefore required to consider the final characteristics of the new discharge and ensure that water quality is not compromised. Furthermore, the installation of new discharge infrastructure and increase in inflow to the lake could potentially alter the hydromorphology of the water body and change aquatic habitats.	
Reclaimed water, water re-use, effluent re-use	Recycling: Littlehampton WTW (15MI/d)	SWS_SNZ_HI-REU_RE1_ALL_for20	Potentially non-compliant (low conf.)	The installation of new discharge infrastructure and increase in flows in the river could potentially alter the hydromorphology of the water body and change aquatic habitats. However, given that this option is intended to augment river flows to support further abstraction, deterioration in water body status is unlikely. Increased river flows could also potentially benefit the downstream Arun Valley Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar. The new discharge of treated effluent could potentially result in physico-chemical effects that could impact on biological status elements for example by increasing nutrient concentrations, changing dissolved oxygen concentrations, and changing water temperature. The water body is currently failing to achieve status targets due to excess phosphorus concentrations from the water industry, and any increases could result in adverse impacts. Further assessment is therefore required to consider the final characteristics of the new discharge and ensure that water quality is not compromised, particularly given the likely connectivity between the river and the Arun Valley SAC, SPA and Ramsar.	Stage 2
Reclaimed water, water re-use, effluent re-use	Recycling: Sittingbourne industrial reuse (7.5MI/d)	SWS_KME_HI-REU_RE1_ALL_sit8	Compliant (low conf.)	-	Stage 2
Reclaimed water, water re-use, effluent re-use	Recycling: Tunbridge Wells WTW conjunctive use with Bewl reservoir (3.6MI/d)	SWS_SHZ_HI-REU_RE1_ALL_env_cu_bew1_conju	Potentially non-compliant (low conf.)	The installation of new discharge infrastructure and increase in inflow to the lake could potentially alter the hydromorphology of the Bewl Water waterbody and change aquatic habitats. It is important to note that the waterbody is already under pressure as a result of physical modifications due to the water industry. A new discharge (treated effluent) into the reservoir could potentially change the physico-chemistry of the water body, for example by increasing nutrient concentrations, changing dissolved oxygen concentrations, and changing water temperature.	Stage 2

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
				<p>The Bewl Water waterbody has had previous issues due to phosphorus, as demonstrated by the current status classification. This could impact phytoplankton communities. Further assessment is therefore required to consider the final characteristics of the new discharge and ensure that water quality is not compromised.</p> <p>The installation of additional infrastructure could potentially conflict with measures in place to address structural modification pressures. A reduction in discharges from the WwTW to Somerhill Stream could potentially change the physico-chemistry of the waterbody. A reduction in nutrient supply is likely to result in beneficial impacts on biological quality elements. However, there is some potential for adverse impacts during periods of low flow, including a reduction in dissolved oxygen concentrations and an increase in water temperature (i.e. due to shallow, sluggish flows). This could potentially result in adverse impacts on biological quality elements.</p>	
Potential Transfer Resource (Treated)	Transfer: Winter transfer Stage 2: New main Shoreham/North Shoreham and Brighton A (4MI/d)	SWS_SBZ_EF-TFR_REP_ALL_har2 res	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Transfer: Utilise full existing KME-KTZ transfer capacity (9MI/d)	SWS_KTZ_HI-TFR_KME_ALL_sel3	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Canterbury (Broad Oak) to Near Canterbury: 20MI/d	SWS_KTZ_HI-TFR_RZ8_ALL canterb-wingha p 20	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Culham (120) - potable - Construction	SWS_T2S_HI-ROC_WT1_CNO_culham120pot	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Culham (50) - potable - Construction	SWS_T2S_HI-ROC_WT1_CNO_culham50pot	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Havant Thicket To Pulborough WTW: 50MI/d	SWS_SNZ_HI-TFR_PWE_ALL_havant -hardha r 50	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Havant Thicket To Pulborough WTW: 20MI/d	SWS_SNZ_HI-TFR_PWE_ALL_havant -hardha r 20	Compliant (Stage 1)	-	Stage 1

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Option Type	Option Name	Option ID	Outcome	Reason, if not confirmed as compliant	Final Stage
Bulk transfers within region (treated)	Import: SEW Kingston to KTZ Near Canterbury (2MI/d)	SWS_KTZ_HI-TFR_AZ7_ALL_win	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Lower Itchen to Portsmouth Water: 45MI/d	SWS_PRT_HI-TFR_HSE_ALL_otterbo-gaters p	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Outwood To Turners Hill: 10MI/d	SWS_SNZ_HI-TFR_SES_ALL_outwood-turner p 10	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	HWZ to Lower Itchen (120) Potable - Construction	SWS_HSE_HI-TFR_T2S_CNO_spar to ott 120 pot	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	HWZ to Lower Itchen (50) Potable - Construction	SWS_HSE_HI-TFR_T2S_CNO_spar to ott 50 pot	Compliant (Stage 1)	-	Stage 1
Bulk transfers within region (treated)	Tilmore to Pulborough: 10MI/d	SWS_SNZ_HI-TFR_RZ5_ALL_tilmore-hardha p 10	Compliant (Stage 1)	-	Stage 1

6. Programme-level WFD Assessment (Stage 3)

In order to understand the WFD compliance of the draft WRMP as a whole, a cumulative assessment has been undertaken of the options within the preferred plan. This makes use of the individual option-level assessments (as presented in **Section 5**), but also recognises that when considered as a whole plan, some water bodies could be impacted by more than one option.

The cumulative assessment is summarised in **Table 4**, showing that five water bodies that could be impacted by one or more options of the Preferred Plan. Four of these relate to the various desalination options which comprise variations of the same scheme implemented at different times. Two groundwater borehole options have also been identified that could lead to cumulative effects on the WFD status of one water body.

No change to the potential risk of WFD non-compliance has been identified as a result of this cumulative assessment.

Table 4 Cumulative Assessment of the Preferred Plan

Type	Water body	Operational Catchment	Options contributing to cumulative effect	Risk of WFD non-compliance	Comments
Groundwater	GB40701 G502900	IOW Lower Greensand	SWS_IOW_HI-GRW_ALL_ALL_nw_gwa_kni_westi, SWS_IOW_HI-GRW_ALL_ALL_br_less	Potentially non-compliant (low confidence)	<p>Potential for cumulative effects on dependent surface water body status and water balance.</p> <p>Connectivity between the aquifer and overlying surface waters is likely to be high due to the permeable nature of the solid and superficial geology, and the proximity of watercourses. Some peat and alluvium along the River Yar which may limit groundwater interaction over some reaches but overall groundwater expected to discharge to the River Yar.</p> <p>A change in baseflow in the River Yar upstream of Alverstone Marshes due to abstraction at Lessland leading to less flow into marshes, and potential drawdown of aquifer near Alverstone Marshes due to abstraction at Newchurch may lead to cumulative effect on Alverstone Marshes SSSI/SAC if each option individually did not.</p> <p>Reduction in flow from both options effects described above may lead to cumulative effect on status of River Yar surface water dependence test. Cumulative effect on water balance due to additional abstraction in water body may affect status if each option individually did not.</p> <p>No change to the overall cumulative risk of potential WFD non-compliance (low confidence).</p>
Coastal	GB65070 4510000	Kent East Coast	SWS_KTZ_HI-DES_ALL_ALL_tha10_p2, SWS_KTZ_HI-DES_ALL_ALL_tha20, SWS_KTZ_HI-DES_ALL_ALL_tha20_p2	Potentially non-compliant (low confidence)	<p>These options are all variations of the same desalination scheme, with different output volumes.</p> <p>The main effects on WFD parameters are associated with the construction of new marine infrastructure and the operational discharge of hypersaline water. Each option is assessed as potentially non-compliant (low confidence) alone. No change to the overall cumulative risk of potential WFD non-compliance (low confidence).</p>

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Type	Water body	Operational Catchment	Options contributing to cumulative effect	Risk of WFD non-compliance	Comments
Transitional	GB53060 4002300	Medway Swale Estuary	SWS_KME_HI-DES_ALL_ALL_ios10, SWS_KME_HI-DES_ALL_ALL_ios20, SWS_KME_HI-DES_ALL_ALL_ios20_p2, SWS_KMW_HI-REU_RE1_ALL_ecc18	Potentially non-compliant (low confidence)	<p>The first three options are all variations of the same desalination scheme, with different output volumes.</p> <p>The main effects on WFD parameters are associated with the construction of new marine infrastructure and the operational discharge of hypersaline water. Each option is assessed as potentially non-compliant (low confidence) alone.</p> <p>Although the fourth option would be located in the same water body as the desalination scheme, construction activities would be a considerable distance apart (22km) and temporary, which limits the potential for direct cumulative effects. No potential cumulative effects during operation have been identified.</p> <p>No change to the overall cumulative risk of potential WFD non-compliance (low confidence).</p>
Transitional	GB53060 4011500	Medway Swale Estuary	SWS_KME_HI-DES_ALL_ALL_ios10, SWS_KME_HI-DES_ALL_ALL_ios20, SWS_KME_HI-DES_ALL_ALL_ios20_p2, SWS_KME_HI-REU_RE1_ALL_sit8	Potentially non-compliant (low confidence)	<p>The first three options are all variations of the same desalination scheme, with different output volumes.</p> <p>The main effects on WFD parameters are associated with the construction of new marine infrastructure and the operational discharge of hypersaline water. Each option is assessed as potentially non-compliant (low confidence) alone.</p> <p>Although the fourth option would be located in the same water body as the desalination scheme, construction activities would be temporary, which limits the potential for direct cumulative effects. No potential cumulative effects during operation have been identified.</p> <p>No change to the overall cumulative risk of potential WFD non-compliance (low confidence).</p>
Coastal	GB64070 4540003	Sussex TraC	SWS_SBZ_HI-DES_ALL_ALL_shom10, SWS_SBZ_HI-DES_ALL_ALL_shom20, SWS_SBZ_HI-DES_ALL_ALL_shom40, SWS_SWZ_HI-DES_ALL_ALL_aru10	Potentially non-compliant (low confidence)	<p>The first three options are all variations of the same desalination scheme, with different output volumes.</p> <p>The main effects on WFD parameters are associated with the operational discharge of hypersaline water. Each option is assessed as potentially non-compliant (low confidence) alone.</p> <p>There is the possibility of the desalination scheme options and the fourth option giving rise to cumulative effects due to water quality impacts during the operational phase, associated with the new</p>

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Type	Water body	Operational Catchment	Options contributing to cumulative effect	Risk of WFD non-compliance	Comments
					discharge from the desalination plant and the altered discharge from Littlehampton WTW. No change to the overall cumulative risk of potential WFD non-compliance (low confidence).

7. Preferred WRMP WFD Assessment Stage 4 Results: assessment against other Plans and Projects

The potential for combined impacts of SWS's draft WRMP24 with other water companies' draft WRMPs has been considered.

The WFD assessment produced by WRSE to support the draft Regional Plan contains an in-combination effects assessment for options across water companies based on the options proposed in the individual WRMP plans.

For Southern Water's draft WRMP24, this identifies the potential for cumulative increased risk of WFD deterioration in 5 water bodies as summarised in **Table 5**. Of these,

- For 4 water bodies all the potential in-combination effects are assessed cumulatively as 'no increase in risk of WFD deterioration',
- For 1 water body, GB40701G505200: Chichester Chalk, the assessment identifies that the operational impact (if options were used at same time) could lead to a temporary, increased risk of WFD deterioration for the waterbody.

The WRSE assessment of the magnitude of potential cumulative effects is in line with this assessment, with two recommendations made for consideration:

- A potential risk of deterioration is not anticipated by WRSE in the Sussex coastal water body (GB640704540003) as a result of potential changes to discharges from the four options in this water body (SWS_SBZ_HI-DES_ALL_ALL_shom10, SWS_SBZ_HI-DES_ALL_ALL_shom20, SWS_SBZ_HI-DES_ALL_ALL_shom40, and SWS_SWZ_HI-DES_ALL_ALL_aru10 - see **Table 4**). However, in the absence of further data, it is recommended that WRSE consider flagging the risk to this water body at this stage.
- For the Chichester Chalk water body GB40701G505200, the two Havant Thicket To Pulborough WTW options are not listed (SWS_SNZ_HI-TFR_PWE_ALL_havant -hardha r 20 and SWS_SNZ_HI-TFR_PWE_ALL_havant -hardha r 50). These pipeline schemes are both screened out at Stage 1 in this assessment because they will not interact with the groundwater body. However, these schemes may add to the temporary construction impacts.

Table 5 Cumulative Assessment of the Preferred Plan against other Plans: Potential increased risk of WFD deterioration (information taken from WRSE draft Regional Plan WFD Assessment)

*SWS options

Waterbody impacted	Water company	Options	Selected Comments
GB40701G501500: East Kent Chalk - Stour	Affinity and Southern Water	Barham Import Increase (of 4MI/d) to 6MI/d *Import: SEW Kingston to KTZ Near Canterbury (2MI/d) *Canterbury (Broad Oak) to Near Canterbury: 20MI/d Dover Docks Reservoir - Broomfield Banks Effluent Reuse Dover Constraint Removal Deal Supply Scheme	Option activities include the installation of new pipelines and below ground structures. These option activities could lead to adverse impacts on the groundwater environment. Options have overlapping construction periods, with operational impacts assumed minimal for all options. The staggered construction impacts partnered with the appropriate mitigation measures (as described in WFD assessments) in place will lead to no increase in risk of WFD deterioration.
GB530603911401: Thames Lower	South East and Southern Water	*Desalination: Isle of Sheppey (20MI/d) *Recycling: Sittingbourne industrial reuse (7.5MI/d) New Company Transfer: RZ8 to RZ6 Transfer - Canterbury to Maidstone (10 MI/d) *Transfer: Utilise full existing KME-KTZ transfer capacity (9MI/d)	Activities include the installation of new pipelines, below ground structures, refurbishment of existing groundwater sources and modification of an existing WTW. There is the potential for WFD deterioration due to the combined impacts of these options. It is anticipated that the impact on the waterbody will not exceed that already described in the Recycling: Sittingbourne industrial reuse (7.5MI/d) option assessment. This is due in part to the minor and localised impacts associated with the other three options and the difference in construction periods leading to an assumed reduced cumulative impact. Therefore, no increased risk of WFD deterioration anticipated and risk remains as amber adverse effect.
GB40601G501700: North Kent Swale Chalk	South East and Southern Water	*Desalination: Isle of Sheppey (20MI/d) *Recycling: Sittingbourne industrial reuse (7.5MI/d) New Company Transfer: RZ8 to RZ6 Transfer - Canterbury to Maidstone (10 MI/d)	Activities include the installation of new pipelines, below ground structures, refurbishment of existing groundwater sources and modification of an existing WTW. It is anticipated that impact on the waterbody will not exceed that already described in Recycling: Sittingbourne industrial reuse (7.5MI/d) option assessment when considering the in-combination effect of the BVP options. This is due in part to the minor and localised impacts associated with the other three

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Waterbody impacted	Water company	Options	Selected Comments
		*Transfer: Utilise full existing KME-KTZ transfer capacity (9MI/d)	options and the difference in construction periods leading to an assumed reduced cumulative impact. Therefore, no increased risk of WFD deterioration anticipated and risk remains as amber adverse effect.
GB40602G500200: North Kent Tertiaries	South East and Southern Water	*Desalination: Isle of Sheppey (20MI/d) Recycling: Sittingbourne industrial reuse (7.5MI/d) New Company Transfer: RZ8 to RZ6 Transfer - Canterbury to Maidstone (10 MI/d)	Activities associated with these three options include the installation of new pipelines, below ground structures, refurbishment of existing groundwater sources and modification of an existing WTW. It is anticipated that impact on the waterbody will not exceed that already described in the Recycling: Sittingbourne industrial water reuse (7.5MI/d) option assessment when considering the in-combination effect of the BVP options. This is due in part to the minor and localised impacts associated with the other three options and the difference in construction periods leading to an assumed reduced cumulative impact. Therefore, no increased risk of WFD deterioration anticipated and risk remains as amber adverse effect.
GB40701G505200: Chichester Chalk	Portsmouth and Southern Water	SRN Source D To Havant Thicket: 50MI/d Havant Thicket To Pulborough WTW: 50MI/d Recycling: Littlehampton WwTW (15MI/d) Drought option: North Arundel Drought Permit/Order (2025 onwards) Drought Permit: Source S	Both SRN Source D To Havant Thicket: 50MI/d and Havant Thicket To Pulborough WTW: 50MI/d cross the 500m water company boundary within the Chichester Chalk waterbody. These options use the same stretch of new pipeline (in opposite directions) and associated crossings, so impacts are assumed to be the same for both options. Recycling: Littlehampton WwTW (15MI/d) option also crosses the boundary and involves a new pipeline and crossings. Drought option: North Arundel Drought Permit/Order (2025 onwards) and Drought Permit: Source S options both impact the groundwater through increased abstractions (outside of RAA rates) to be used as emergency sources in droughts. They are both scheduled to be ready for operation by 2026 and it is assumed that the operational impact (if options were used at same time) could lead to a temporary, increased risk of WFD deterioration for the waterbody.

8. WFD compliance summary of the Southern Water draft WRMP24

A summary of the assessment is provided in **Table 5**, which considers the overall compliance of the Preferred Plan.

The assessments shown in this report currently conclude potential non-compliance of the Preferred Plan, with individual options being potentially non-compliant with either low or medium confidence.

Those that have low confidence of non-compliance are considered relatively precautionary assessments, whereas for those with medium confidence of non-compliance, there is a greater chance of a conclusion of non-compliant being retained following further assessments. However, in all cases, further evidence and assessment is required, and is being progressed through the programme of work to reduce delivery risk as well as programmes to support the Hampshire Water Transfer and Water Recycling Project (HWTWRP) SRO. Given the significant lead in time for some options, it is considered to provide an adequate period with which to conclude such investigations and establish conclusions with which the regulator would concur.

However, if after the completion of the further work, a conclusion of potential non-compliance remains, Southern Water will then review the potential to use alternative water resource options. In this regard, given that 193 of the original 288 constrained options were assessed as passing the initial Stage 1 WFD assessment, Southern Water has a range of options that are considered to be viable and potentially deliverable if required.

Table 6 Summary of plan level WFD compliance for the Southern Water WRMP24

WFD Assessment Objective	Summary of WFD compliance (Preferred Plan)	Explanation
1) To prevent deterioration of any WFD element of any water body - in line with Regulation 13(2)a and 13(5)a	Potentially non-compliant	<p>21 preferred options in the plan remain potentially non-compliant at this stage, due to the relatively limited level of evidence and assessment available. Further evidence collection and assessment is ongoing through the programme of work to reduce delivery risk with pre-planning work and enabling studies. This includes:</p> <ul style="list-style-type: none"> ■ Engineering, process, MEICA, civil engineering and network connectivity work, with activities including: <ul style="list-style-type: none"> - Water quality sampling of sources and baselining for consideration in design; - Intake and outfall screening and pipe configurations; - Detailed site locations and assessments; - Saline plume modelling (for desalination plants). ■ Environmental and planning works <ul style="list-style-type: none"> - Baseline surveys of the current environmental conditions, possibly over multiple years - Investigations on the impact of any new discharge in conjunction with the Environmental Quality Standards (EQS (environmental quality standards) <p>Some of this will be completed through the further work to support SRO programme.</p>

WFD Assessment Objective	Summary of WFD compliance (Preferred Plan)	Explanation
<p>2) To prevent the introduction of impediments to the attainment of 'Good' WFD status or potential for any water body -in line with Regulation 13(2)b and 13(5)c.</p>	<p>Potentially non-compliant</p>	<p>21 preferred options in the plan remain potentially non-compliant at this stage, due to the relatively limited level of evidence and assessment available. Further evidence collection and assessment is ongoing through the programme of work to reduce delivery risk with pre-planning work and enabling studies. This includes:</p> <ul style="list-style-type: none"> ■ Engineering, process, MEICA, civil engineering and network connectivity work, with activities including: <ul style="list-style-type: none"> - Water quality sampling of sources and baselining for consideration in design; - Intake and outfall screening and pipe configurations; - Detailed site locations and assessments; - Saline plume modelling (for desalination plants). ■ Environmental and planning works <ul style="list-style-type: none"> - Baseline surveys of the current environmental conditions, possibly over multiple years - Investigations on the impact of any new discharge in conjunction with the Environmental Quality Standards (EQS (environmental quality standards) <p>Some of this will be completed through the further work to support SRO programme.</p>
<p>3) To ensure that the planned programme of water body measures in RBMP2 to protect and enhance the status of water bodies are not compromised.</p>	<p>Compliant</p>	<p>No planned water body measures, as identified in the RBMP2, have been identified as being compromised.</p>
<p>4) To assist the attainment of the WFD objectives for the water body – in line with Regulation 13(2)b and 13(2)c</p>	<p>Neutral</p>	<p>The assessment as presented here does not show that the plan would assist in attainment of the WFD objectives for any water bodies. However, this may be possible through delivery of BNG or other enhancements, once those are further developed. Demand and leakage management options could also assist.</p>
<p>5) To assist the attainment of the WFD objectives for associated WFD protected areas – in line with Regulation 13(6)</p>	<p>Compliant</p>	<p>The HRA for the WRMP concludes that, based on the currently available data, none of the options will adversely affect the integrity of any European sites, alone or in combination.</p>

WFD Assessment Objective	Summary of WFD compliance (Preferred Plan)	Explanation
6) To progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment	Compliant	The options in the preferred plan will be compliant with any required discharge consents. This will ensure that there are any activities do not have a significant adverse effect or pose a risk of a significant adverse effect on the aquatic environment. .

Appendix A: Initial Stage 1 Screening Results of Constrained Options

This Appendix presents the results of the initial Stage 1 constrained options WFD assessment. 288 constrained options were initially subjected to Stage 1 WFD assessment, completed by Mott Macdonald on behalf of Southern Water Services using the agreed WRSE Regional Plan methodology, and used to inform the WRSE Emerging Regional Plan.

Appendix B: Preferred options: demand management options and drought options

This Appendix lists Southern Water’s preferred options which are not included in this WFD assessment, comprising:

- **7 demand management options**, which will not impact on WFD status. It is assumed that these will be employed across the planning period. The ‘demand side’ measures are not geographically specific at the WRMP level, and could be applied anywhere within SWS’s network. Location-specific information on the measures is not available without specific investigations, which would form part of the package (for example, the location and severity of most leakages is not known).
- **56 drought options** identified in the emerging Drought Plan and assessed as part of the WFD assessment of that Plan (available from Southern Water). These comprise non-essential use bans which will not impact on WFD status and drought orders/permits subject to separate EARs. These options do not deviate from the Drought Plan proposals, but are identified as WRMP options for modelling purposes (i.e. they are assumed to still be available for use beyond the end of the current Drought Plan period).

Table B1: Preferred demand-side options

Option Ref / Name	Summary	Yield (Ml/d)
SWS_T100 Audits (all)	A co-ordinated programme of water audits. Contains the following sub options: - Normal Water Audits (audit a) - Smart metering assisted water audits (audit b)	2.5
SWS_T100 Comms (all)	A marketing and comms campaign to promote behaviour change to reduce the amount of water used. Contains three sub-options: - National Campaign - Local Campaign - Awareness Campaign	9.12 (by end of programme)
SWS_T100 Education (all)	Educational talks (schools and groups and Water Efficiency events). Aim to raise awareness and the importance of water efficiency to ensure water supplies and the environment are sustainable in the future. School children will be the future bill payers and can also take home the messages to parents. This engagement sits alongside areas such as smart metering to help homes and families understand the context behind which these initiatives reside. We Are Futures: Currently engaged to create water efficiency course content and other mechanisms for embedding T100 values at an early age.	3 (by end of programme)
SWS_T100 Products and innovation (all)	A co-ordinated programme of water efficiency products, services and innovation to reduce water consumption. Contains the following sub options: - Colour changing/more efficient showers - Supply of products to reduce garden water use - Leaky loo campaign - Goal setting templates - Innovation programme	32 (by end of programme)

Option Ref / Name	Summary	Yield (Ml/d)
SWS_T100 Reg and Policy (all)	This is a programme of changes to regulation and policy with regard to new building standards and appliances to reduce water consumption. Contains three sub options: - New building standards to 100l/p/d (from 2030) - New building standards to 85l/p/day (from 2035) - New water efficiency labelling on products (from 2030)	6.5
SWS_T100 Smart Metering (all)	Rollout of AMI Smart meters to all households over the 2025-2030 period.	11
SWS_T100 Tariffs (all)	Applying differential tariffs such as a summer/winter tariff or a rising block tariff to deliver a dual benefit of reducing water wastage and reducing bills. The AMI smart metering programme acts as an enabler to implement different tariffs structures in future. This option could be utilised, for example, to change tariffs during dry weather events to peak lop demand or reduce demand over the year on average. The operating cost of the option is unlikely to vary year on year as it is a billing tool, however, it would have a net positive impact on carbon through reduced water consumption.	14.6

Appendix C: Combined Stage 1 and Stage 2 Screening Results of Preferred Options

This Appendix presents the summary combined results of the WFD compliance assessment screening outcomes (Stage 1) and impact assessment (Stage 2) for all of the preferred options assessed. Where an option has been screened in for an impact assessment, the water bodies that were screened in are identified on separate lines.

A breakdown of the Stage 1 assessment by activity is presented in **Appendix D**. The Stage 2 impact assessments for the options and water bodies scoped in for further assessment are presented in **Appendix E**.

Appendix D: Breakdown of Stage 1 and Stage 2 Screening Results of Preferred Options

This Appendix presents the activity breakdown of the WFD compliance assessment screening outcomes (Stage 1) for the preferred options assessed and indicates whether they were screened in for an impact assessment (Stage 2) based on the potential risk of deterioration of WFD status. Where an option has been screened in for an impact assessment, the water bodies that were screened in have also been identified.

The individual impact assessments for the options and water bodies scoped in for further assessment are presented in **Appendix E**.

Appendix E: Stage 2 Preferred Options Impact Assessments

This Appendix presents the impact assessment (Stage 2) for the options that were screened in for more detailed assessment. An impact assessment table has been completed for each water body for each option that has been identified through the screening process.