

Drought Plan 2019

Annex 13: Water Framework Directive Assessment

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**Southern
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Glossary

Drought Order

An authorisation granted by the Secretary of State under legally defined drought conditions which (amongst other powers) gives a water company the power to temporarily abstract and/or impound and/or discharge water outside of the normal abstraction licence regulatory process, or to temporarily modify the conditions of any existing abstraction licence/legal authorisation.

Drought Permit

An authorisation granted by the Environment Agency under legally defined drought conditions which gives a water company the power to temporarily abstract and/or impound water outside of its normal abstraction licence permissions.

Macroinvertebrates

Macroinvertebrates are small animals (but visible with the naked eye) without a backbone, for example insects, worms and larvae. Rivers and most water bodies normally contain communities of aquatic macroinvertebrates. The species composition, species diversity and abundance in a given river or water body can provide valuable information on the relative health and water quality of that river or water body.

Natural Environment and Rural Communities (NERC) Act Section 41

In England, many rare and threatened species are listed under Section 41 of the 2006 Natural Environment and Rural Communities (NERC) Act. Outcome 3 of the Government's Biodiversity 2020 strategy contains an ambition to ensure that *'By 2020, we will see an overall improvement in the status of our wildlife and will have prevented further human-induced extinctions of known threatened species.'* Protecting and enhancing England's designated Section 41 species is key to delivering this outcome.

Water Framework Directive (WFD)

Water Framework Directive: Council of the European Communities 2000 Directive 2000/60/EC (OJ No L 327 22.12.2000) (establishing a framework for Community action in the field of water policy). This important European Union directive for management of the water environment and water catchment areas was transposed into national law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (Statutory Instrument 2003 No. 3242). In April 2017 these were replaced by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Statutory Instrument 2017 No. 407).

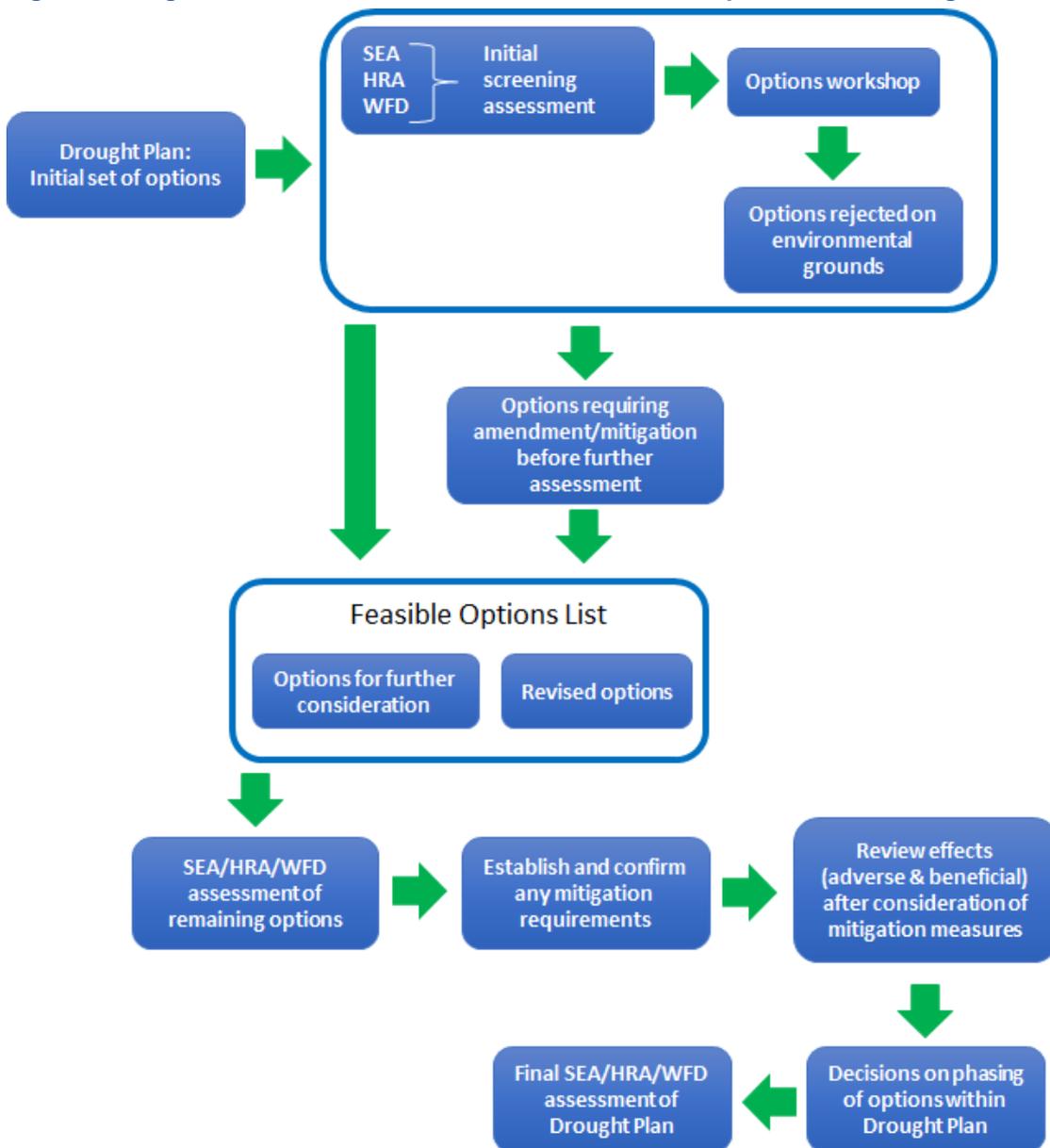
1 Introduction

1.1 Purpose of the Water Framework Directive assessment

This report summarises the results of the Water Framework Directive (WFD) assessment of the Southern Water Services (“Southern Water”) Drought Plan 2019. The methodology adopted is in accordance with the Environment Agency’s 2015 Drought Plan Guidance (DPG) first published in July 2015, the Drought Plan Guideline Extra Information - Environmental Assessment for Water Company Drought Plans (2016) issued by the Environment Agency (and updated September 2017).

The WFD assessment of the Drought Plan 2019 includes both the supply-side and demand-side measures considered for inclusion in the plan. Figure 1 illustrates how the WFD assessment (as well as the SEA and HRA) have influenced the development of the Drought Plan.

Figure 1 Integration of the WFD assessment into the development of the Drought Plan



1.2 Drought planning and WFD

In the event of a drought, Southern Water will need to implement a range of management measures to ensure the continued provision of essential water supplies to all of its customers. The Southern Water Drought Plan sets out the range of measures that the company will consider implementing in managing drought conditions, taking account of statutory legislation and regulatory requirements. These measures include a number of potential supply augmentation options as well as a range of drought orders or drought permits that Southern Water may apply for to enable additional water to be abstracted from the water environment. Drought Order or Permit applications are made in accordance with the Water Resources Act 1991, as amended by the Environment Act 1995, the Water Act 2003 and the Water Act 2014.

The Drought Plan outlines the steps that would be taken by Southern Water to ensure it can maintain essential water supplies to its customers while minimising the impact on the water environment. The drought management measures considered within the Drought Plan include:

- Demand-side measures: these include water use restrictions and actions to reduce leakage or enhance water conservation activities
- Supply-side measures: these include drought permits or drought orders and the use of standby or emergency water sources to augment available supplies.

In developing the drought plan, a balance needs to be struck between ensuring essential water supplies can be maintained to customers and protection of the environment, including compliance with the WFD and other environmental regulations.

The DPG (2015) and supplementary guidance (2016 and further updated in 2017) requires that an assessment is carried out of how the drought plan may affect WFD status (or potential) and how the drought plan might affect the environmental objectives and measures set out in River Basin Management Plans (RBMPs). The latest (2015) RBMPs include:

- 2015 classification results that form the baseline for assessing deterioration in water body status for the 6-year period (December 2015 to 2021)
- Updated water body status objectives
- Updated Protected Area objectives
- Programme of Measures required to help achieve the stated water body objectives.

It is important to note that the baseline for assessing drought plan measures is considered as the conditions anticipated in a natural drought and with all existing abstractions and discharges in operation under their normal regulatory conditions. In a drought, the environment and ecosystems will already be under stress prior to implementation of any drought plan measures. The WFD assessment of the Drought Plan only considers the impact of implementing the drought plan measures against the baseline of drought conditions.

Additionally, the assessment should take account of the purpose of the WFD as set out in Article 1 of the Directive - this highlights that it is intended (amongst other purposes) to contribute to “mitigating the effects of floods and droughts and thereby contribute to the provision of the sufficient supply of good quality surface water and groundwater as needed for sustainable, balanced and equitable water use”.

The Environmental Assessment for Water Company Drought Plans guidance (2016 and 2017) states that the WFD Articles most relevant to drought plans are 4.1 and 4.6 to 4.9, which are discussed in the following sections:

- Article 4.1 Environmental objectives
- Article 4.6 Temporary deterioration in status
- Article 4.7 Defence against breach of WFD objectives
- Article 4.8 Impact on other water bodies
- Article 4.9 Level of protection.

The 2016 and 2017 Environment Agency guidance specifically requires that the potential impacts of the drought plan measures on the following are considered (as discussed further within Section 2.1 of this report):

- Impacts on the quality elements or features that are used to determine WFD surface water and groundwater body status and elements that could influence the status; and
- Impacts on priority substances, priority hazardous substances and other pollutants.

1.2.1 Article 4.1 Environmental objectives

The WFD environmental objectives under Article 4.1 are:

- Prevention of deterioration in status of surface waters and groundwater
- Achievement of objectives and standards for Protected Areas
- Aims to achieve good status for all water bodies by 2015. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve good status by 2021 or 2027 or set a less stringent objective
- Aims to achieve good ecological potential and good surface water chemical status for heavily modified water bodies and artificial water bodies
- Reversal of any significant and sustained upward trends in pollutant concentrations in groundwater
- Cessation of discharges of priority hazardous substances into surface waters
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants.

A 2015 European Court of Justice (ECJ) ruling¹ clarified that ‘no deterioration’ in Article 4.1 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.

The Environment Agency’s 2016 and 2017 Guidance also confirms that this approach should be taken for each water body affected and that it should be clearly indicated whether the changes are temporary. It advises that if the drought plan has the potential to result in WFD status deterioration, then mitigation measures should be clearly set out, referencing the relevant Articles from the WFD.

1.2.2 Article 4.6 Temporary deterioration

Article 4.6 of the WFD makes provision for exemptions for temporary deterioration of status, that are “the result of circumstances of natural causes or force majeure which are exceptional or could not reasonably have been foreseen, in particular extreme floods and prolonged droughts, or the result of circumstances due to accidents which could not reasonably have been foreseen”.

The Environment Agency’s 2017 Guidance confirms that Article 4.6 can apply to the implementation of drought plan measures. Drought Plans can cover circumstances that are exceptional and so may need to contain actions which would cause temporary deterioration. In relation to drought, exceptional circumstances could reasonably relate to shortage of rain, low river flows or levels, low groundwater levels or low reservoir levels where these are due to natural cause or force majeure. In providing this guidance, the Environment Agency refers to the Common Implementation Strategy for the Water Framework Directive (2000/60/EC).² Any exemptions under this Article must also be considered alongside the requirements of Article 4.8 and 4.9.

1.2.3 Article 4.7 Defence against breach of WFD objectives

Article 4.7 of the WFD makes provision for exemptions to the achievement of certain WFD objectives³ which might need to be considered within the context of the objectives of Drought Planning. Exemptions may be invoked where there is a failure to prevent deterioration of status arising from new modifications or new sustainable human development activities where there are reasons of over-riding public interest or where the benefits of achieving WFD objectives are outweighed by the benefits to human health, human safety or sustainable development. Various other criteria must also be met before such exemptions can be considered, along with Article 4.8 and 4.9.

Risks of temporary WFD status deterioration have been brought to the attention of the Environment Agency during the development of the Drought Plan and in the associated Environmental Assessment Reports for the Drought Orders and Permits. Further dialogue will be required with the

¹ ECJ Case C-461/13: Bund für Umwelt und Naturschutz Deutschland v Bundesrepublik Deutschland <http://curia.europa.eu/juris/document/document.jsf?docid=178918&mode=req&pageIndex=1&dir=&occ=first&part=1&text=&doclang=EN&cid=175124> [accessed 30.6.16]

² Common Implementation Strategy for the Water Framework Directive (2000/60/EC) (2009) Guidance Document No. 20 Guidance Document on Exceptions to the Environmental Objectives

³ See European Communities (2009) Common Implementation Strategy for the WFD (2000/60/EC): Guidance Document 20 on Exemptions to the Environmental Objectives

Environment Agency in the event that Article 4.7 is required to be invoked as part of implementing a drought plan measure.

1.2.4 Article 4.8 Impact on other water bodies

Article 4.8 of the WFD requires that a Member State ensures that if an exemption such as Article 4.6 or 4.7 is utilised that it “*does not permanently exclude or compromise the achievement of the objectives of [the WFD] in other bodies of water within the same river basin district and is consistent with the implementation of other Community environmental legislation*”.

1.2.5 Article 4.9 Level of protection

Article 4.9 of the WFD requires that when applying exemptions under Article 4 the same level of protection must be given as in existing EU legislation and that the objectives and obligations set down by them cannot be deviated from.

1.3 Background to WFD status classification

This section provides an overview of RBMPs and the associated Programme of Measures and how they may relate to drought plan measures. An overview of the assessment methodologies for the status of different water body types and how they might relate to Drought Planning is also provided.

Not all of this section will be relevant to every drought plan measure and will depend on the particular measure being considered. Where applicable, evidence for the effects on water bodies is provided in the accompanying drought permit/drought order Environmental Assessment Reports (EARs).

1.3.1 RBMPs

RBMPs are required to report on the planned steps and measures required to achieve the environmental objectives of the WFD. They provide the framework for protecting and enhancing the water environment. The RBMPs are required to include the information listed in WFD (Annex VII). The RBMPs provide an overview of the baseline characterisation of water bodies and their status classification, the statutory objectives for Protected Areas, statutory objectives for water bodies and a summary of the Programme of Measures to achieve statutory objectives. The WFD assessment of the Drought Plan will need to demonstrate that implementation of the Drought Plan will not adversely affect the delivery of the confirmed Programme of Measures or other actions set out in the relevant RBMP.

1.3.2 Surface water

Under the WFD, surface water categories include rivers, lakes, transitional waters or coastal waters (TraC). In addition, there are surface waters that can be characterised as Artificial Bodies or Heavily Modified Water Bodies (Section 1.3.4). Good surface water status is when the surface water body is assessed as having at least good status for both ecological status and chemical status. Surface water bodies can be classed as high, good, moderate, poor or bad status.

For WFD status classification, the Environment Agency⁴ has set out the methodology for classification of surface waters which is based on the both ecological status and chemical status. Ecological status is based on biology, physico-chemical, specific substances and hydromorphology as well as incorporating the results of the chemical status assessment (priority substances). Biological status is a sub-set of ecological status where physico-chemical parameters, specific substances and hydromorphology are not considered. Ecological status is determined by the element with the lowest classification. The methodologies for status classification are slightly different for each surface water body type as outlined by the Environment Agency⁴.

Drought Plan measures have the potential to affect the physical environment of rivers, reservoirs and transitional water bodies due to changes in water levels and flow regimes. Demand management measures may have a beneficial effect on some surface water bodies during drought by reducing the overall volume of water being abstracted from water sources. Measures to augment water supplies during a drought may have beneficial effects on some surface water bodies (e.g. reservoirs) if water levels are conserved or increased (e.g. by reducing compensation flow releases or pumping more water in to the water body). Other supply augmentation measures have the potential to adversely impact upon WFD biological quality elements which could in turn lead to a deterioration of status, particularly WFD biological elements:

- *Rivers*: macroinvertebrates, macrophytes, fish, and diatoms
- *Lakes/reservoirs*: phytoplankton, macrophytes and phytobenthos (diatoms), macrophytes and macroinvertebrates
- *Transitional and Coastal (TraC) Waters*: phytoplankton, macroalgae, angiosperms, benthic invertebrates and fish (transitional waters only).

It is the biological status that is invariably at the highest risk of impact from supply augmentation measures in drought plans and is therefore the principal focus of the environmental assessment of the Drought Plan. There are also risks to physico-chemical parameters that predominately support the biological elements and which need to be carefully considered, noting that each surface water body type has different physico-chemical monitoring and classification standards associated with them⁴.

Hydromorphology is taken into account for rivers when classifying high status water bodies and where flows are supporting, or not supporting, good ecological status. UKTAG (2014)⁵ provides guidance for assessing changes in lake levels based on bathymetry data and lake level regimes; UKTAG (2009)⁶ provides guidance on condition limits for transitional waters based on the changes to their freshwater flows.

Chemical status is assessed through consideration of compliance with environmental standards for chemicals that are designated as Priority Substances and/or Priority Hazardous Substances. Changes to chemical status as a result of drought plan implementation are likely to be temporary and generally are unlikely to affect WFD chemical status. An example of where WFD assessment may be required to focus on chemical status is when there is a possibility of cumulative, in combination effects of a nearby discharge from a wastewater treatment works which includes Priority

⁴ Environment Agency (2012) Method statement for the classification of surface water bodies v3 (external release) Monitoring Strategy

⁵ UKTAG (2014) Updated Recommendations on Environmental Standards River Basin Management (2015-21). Final Report January 2014.

⁶ UKTAG (2009) UK Environmental Standards and Conditions (Phase 2). March 2008.

(Hazardous) Substances, and where the Drought Plan measure reduces the buffering capacity of the receiving waters.

1.3.3 Groundwater

Good groundwater status is achieved for a groundwater body when both its quantitative status (i.e. water quantity/water balance) and its chemical status (i.e. water quality) are at least 'good'. Status classification involves carrying out "tests" on groundwater bodies as listed below. The methodologies for assessing groundwater status are outlined in a series of UKTAG documents (2012)⁷.

■ Quantitative status element:

- Dependent surface water body status
- Groundwater Dependent Terrestrial Ecosystems⁸ (GWDTEs)
- Water balance
- Chemical considerations.

■ Chemical status element:

- Dependent surface water body status
- Drinking Water Protected Area considerations
- Groundwater Dependent Terrestrial Ecosystems
- Saline Intrusion
- Chemical considerations.

1.3.4 Heavily modified or artificial water bodies

Classification of Heavily Modified or Artificial Water Bodies (HMAWB) is based on mitigation measures being in place to reach good ecological potential⁹ rather than status. Article 2.8 of the WFD defines an Artificial Water Body as a "*body of surface water created by human activity*". Article 2.9 defines a Heavily Modified Water Body as a "*body of surface water which, as a result of physical alterations by human activity, is substantially changed in character*".

⁷ UKTAG (2012) Paper 11b(i) Groundwater Chemical Classification for the purposes of the Water Framework Directive and the Groundwater Directive and UKTAG (2012) Paper 11b(ii): Groundwater Quantitative Classification for the purposes of the Water Framework Directive

⁸ GWDTE is defined as "A terrestrial ecosystem of importance at Member State level that is directly dependent on the water level in or flow of water from a groundwater body (that is, in or from the saturated zone). Such an ecosystem may also be dependent on the concentrations of substances (and potential pollutants) within that groundwater body, but there must be a direct hydraulic connection with the groundwater body." From UKTAG (2005) Draft Protocol for determining "Significant Damage" to a "Groundwater Dependent Terrestrial Ecosystem".

⁹ Good Ecological Potential is "the degree to which the quality of the water body's aquatic ecosystem approaches the maximum it could achieve, given the heavily modified or artificial characteristics of the water body that are necessary for the use or for the protection of the wider environment"

A water body is designated as Artificial or Heavily Modified if the ability to achieve good ecological status is limited and where the changes necessary to the hydromorphology of the water body to achieve good ecological status would have significant adverse effects on the specified uses. These specified uses can include for example, navigation, water regulation, urbanisation and flood protection.

If mitigation measures are not in place to address the effects of the specified use(s), then ecological potential is assessed as 'moderate'; once acceptable mitigation measures are in place, the potential is assessed as 'good'. The mitigation measures must relate to the adverse impacts on the water environment that the different water uses can have. There is specific guidance from UKTAG (2013)¹⁰ on designing appropriate mitigation flow regimes to achieve good ecological potential in rivers designated as heavily modified because of the impacts of water storage and water supply.

The Drought Plan measures should not prevent the implementation of mitigation measures required in order to meet good ecological potential; the extent of any temporary impact on implementation of these mitigation measures will be assessed, where applicable, as part of the Drought Plan WFD assessment.

1.3.5 Protected Areas

Under Article 6 of the WFD, Member States are required to establish a register of Protected Areas within each river basin. Protected Areas are areas of land and water bodies that require special protection under WFD as set out below:

- Recreational waters – linked to the Bathing Water Directive
- Drinking Water Protected Areas – linked to the Drinking Water Directive
- Economically significant species – including shellfish waters¹¹
- Nutrient sensitive areas (Nitrate vulnerable zones) – linked to the Nitrates Directive
- Nutrient sensitive areas – linked to the Urban Waste Water Treatment Directive
- Natura 2000 sites: water dependent sites¹²:
 - Special Protection Areas (SPAs) - Conservation of Wild Birds Directive
 - Special Areas of Conservation (SACs) - Habitats Directive

10 UKTAG (2013) River flow for good ecological potential Final recommendations. UKTAG December 2013. Version 1.0.

11 The Shellfish Directive 2006/113/EC was repealed by the Water Framework Directive 2000/60/EC in 2013. The shellfish waters protected areas are waters designated by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 as amended. The aim is to protect and improve water quality, to support the growth of healthy shellfish (bivalve and gastropod molluscs) and contribute to good quality edible shellfish.

12 Natura 2000 protected areas "are designated for one or more water-dependent „feature onto the register of protected areas, as required by Article 6" of the WFD. Definition from UKTAG (2011) Guidance on determining whether Natura 2000 Protected Areas are meeting the requirements of Article 4 (1c). Final – Revised March 2011.

1.4 Consultation

Discussions have been held with the Environment Agency on the potential implications of the Drought Plan measures on WFD status as part of the development of the draft Drought Plan. This included sharing draft Environmental Assessment Reports for the drought orders and permits contained in the draft Drought Plan.

The draft Drought Plan was subject to formal consultation and feedback from the consultation process has informed the development of the final Drought Plan 2019 and this updated WFD assessment report. Annex 8 to the final Drought Plan details the engagement with regulatory bodies.

2 Approach

2.1 Assessment

The WFD assessment involves a review of the water bodies that may be affected by the drought plan measures and consideration of the objectives set out below. As a guide, consideration will be given to:

- Potentially affected water bodies and associated WFD Protected Areas
- Current water body status, including a breakdown of the status of individual elements or tests, as relevant
- Defined objectives for the water bodies and Protected Areas (where available)
- Mitigation measures for relevant Artificial and Heavily Modified water bodies (where available).
- Programme of measures contained within River Basin Management Plans (where published)

The assessment provides an indication of the risk of a change in the status of each relevant WFD element or status test, or risk of adverse effects on defined objectives, RBMP measures or mitigation measures (as applicable), as well as consideration as to whether the risk of change would be temporary (and therefore reversible) or permanent. This has drawn on the hydrological/hydrogeological and environmental assessments of supply-side options and drought permit/order options.

Fundamental environmental objectives of the WFD are to attain good ecological status and prevent deterioration of the status of water bodies. These objectives are set down in Article 4 of the WFD as set out in Section 1 earlier. Any new development (as well as existing operations) must ensure that these WFD objectives are not compromised.

Article 4 on environmental objectives has been interpreted and further developed in Environment Agency (2016)¹³, Defra/EA (2009)¹⁴, DoE NI (2012)¹⁵ and in the Water Resources Planning Guideline (2016) to give a series of objectives to test in the WFD assessment. Based on these, the following are set out in this WFD methodology as objectives against which the Drought Plan can be tested:

- Objective 1: To prevent deterioration between status classes of any waterbody, including any temporary deterioration in status
- Objective 2: To prevent the introduction of impediments to the attainment of Good WFD status or potential for the waterbody. It is noted that for some waterbodies, it is accepted that achievement of Good status or potential is currently technically infeasible or disproportionately costly. Where this is the case, the test will be applied to the currently agreed objectives for that water body rather than against Good status/potential.

13 EA (2016) Protecting and improving the water environment – Water Framework Directive compliance of physical works in rivers. Doc No. 488_10.

14 Defra/EA (2009) WFD Expert Assessment of Flood Management Impacts. Joint Defra/ EA Flood and Coastal Erosion Risk Management R&D Programme. R&D Technical Report FD2609/TR. Report prepared by Royal Haskoning.

15 Department of the Environment Northern Ireland (2012) Carrying Out a Water Framework Directive (WFD) Assessment on EIA Developments. A Water Management Unit Guidance Note. March 2012

- Objective 3: To ensure that the planned Programme of Measures in the RBMP to help attain the WFD objectives for the waterbody (or the environmental objectives in the 2015 RBMPs) are not compromised.
- Objective 4: To ensure the achievement of the WFD objectives in other waterbodies within the same catchment are not permanently excluded or compromised.

Two further objectives have been added to review and document if the scheme assists the meeting of WFD objectives, which is over and above a test of WFD compliance of the scheme:

- Objective 5: To ensure no adverse effects on Protected Areas and WFD objectives for these Protected Areas
- Objective 6: To ensure no hindrance to measures to address priority substances, priority hazardous substances and other pollutants

2.2 Stages of assessment

A sequential 2-stage process for undertaking WFD assessments has been applied as follows:

- WFD screening: involves a preliminary assessment of the drought measure and identifies if there is any risk of deterioration in WFD status.
- WFD assessment: This involves using available environmental and hydrological data and evidence to assess the likely changes to hydro-morphology occurring as a result of the drought measure and the possible risk of changes for biology. This is then equated to a level of risk of deterioration in WFD status class, ranging from negligible to high. This stage of assessment is supported by the drought order/drought permit Environmental Assessment Reports (EARs) where applicable.

2.3 Supporting information

Environmental Assessment Reports (EARs) been completed for each Drought Order/Drought Permit contained in the Drought Plan and these have been used to inform the WFD assessment. These provide assessments of the potential environmental effects of implementing the drought measures, over and above those effects arising due to natural drought and those which would occur under 'normal' abstraction licence conditions. The assessment also considers how the proposed Drought Order or Permit may affect the environment in combination with the effects of other existing abstraction licences, environmental permits and other drought plan measures.

The WFD status, water body information and information on the linked protected areas has been obtained from the Environment Agency (2016)¹⁶ online "Catchment Data Explorer" for RBMP2 for the year 2015.

¹⁶ Environment Agency (2016). Catchment Data Explorer - New version released 31/03/2016.
<http://environment.data.gov.uk/catchment-planning/>

2.3.1 Hydrology/ hydrogeology assessment

The hydrological/hydrogeological assessment methodology used in the Environmental Assessment Reports incorporates the characterisation of the baseline surface water and/or groundwater conditions and considers how the drought order/permit may lead to changes in water levels and/or river flows, and the consequent implications for surface water features such as river channel parameters (e.g. wetted width, water depth, flow velocity), estuarine dynamics or water levels in standing water bodies or wetland features. This is supported by the physical environment characterisation which has described the baseline geomorphology and anthropogenic features, water quality and environmental pressures together with an assessment of the consequences of the hydrological/hydrogeological changes on the physical environment. Other abstractions have also been reviewed within the physical environment assessment, along with discharges to the water environment.

2.3.2 Surface water bodies WFD assessment

The ecological assessments underpinning the WFD risk assessments have been undertaken within the Environmental Assessment Reports recognising the CIEEM study guidelines¹⁷ and using the most recent available WFD monitoring data, along with other relevant survey data and evidence relevant to the water body. The assessment has considered the likely magnitude of impact (from negligible to high) and the overall significance of impact (from negligible to major). This assessment has been used alongside the WFD status assessment data for each relevant water body to form a judgement as to the likely risk of temporary (or permanent) deterioration to the status of each applicable element for each water body. The risk of temporary (or permanent) deterioration is expressed against a risk scale of negligible to high, noting that this remains a **risk** and not a statement of certain deterioration; the higher the risk rating, the greater the likelihood that the risk may actually occur.

2.3.3 Groundwater WFD assessment

The elements that are generally at highest risk of impact from the Drought Plan measures relating to groundwater abstraction are the dependant surface water bodies and Groundwater Dependent Terrestrial Ecosystems (GWDTEs).

- The groundwater dependent surface water body status test is addressed as part of the surface water status section by assessing the risk of change in the status of the biological elements of the surface water bodies in hydraulic connection with the aquifer.
- The GWDTE test is addressed through the assessment of groundwater dependent wetlands, notably those located either within Protected Areas (e.g. Natura 2000 Sites) and Sites of Special Scientific Interest (SSSI) or the UK Priority Habitat Inventory (PHI – NERC habitats). The risk of “*significant damage to terrestrial ecosystems which depend directly on the groundwater body*”¹⁸ is assessed and summarised in the groundwater body WFD assessments.

17 CIEEM (2016) Guidelines for Ecological Impact Assessment for the UK and Ireland – Terrestrial, Freshwater and Coastal, Second Edition, January, 2016.

18 The term “significant damage” has been described in UKTAG (2005) as a function of: “a) ‘degree of damage’ occurring to a GWDTE (caused by groundwater related factors); and b) the ‘significance’ or ‘conservation value’ of the ecosystem”.

- The potential for saline intrusion as a result of the drought measure or any other changes in the chemical status of the groundwater body are also assessed.

Changes to groundwater conditions due to drought plan measures are generally likely to be temporary and are generally unlikely to cause an impact at a groundwater body scale that would lead to temporary status deterioration of a groundwater body.

2.3.4 Protected Areas assessment

The objectives for the WFD Protected Area types are listed in the relevant RBMPs and assessment is needed to establish if any drought plan measures hinder the attainment of these objectives. Drought Plan measures may impact upon the flow and water levels of surface water and groundwater levels which could impact upon the physical environment required to support habitats and species. Natura 2000 sites are likely to be the main WFD Protected Areas of concern for the potential impacts of drought plan measures (which has been assessed through the accompanying Habitats Regulations Assessment (HRA) report).

The other types of WFD Protected Area where drought management measures could potentially have an affect are nutrient sensitive areas or potentially bathing waters, due to reduction to the buffering capacity of rivers and an increase risk of an existing wastewater treatment works having an impact on these designated areas. The risk may not increase that greatly compared with baseline drought conditions but has been assessed on a case by case basis.

2.4 Cumulative assessment

The WFD assessment also considers the cumulative, in combination effects of implementing the range of drought plan measures to assess how various measures may interact with each other, and in combination with other plans, programmes or projects (both within Southern Water and external to Southern Water). This dovetails with the cumulative, in combination assessments being undertaken in parallel for the Habitats Regulations Assessment and Strategic Environmental Assessment of the Drought Plan, along with the Environmental Assessment Reports.

3 Summary of Drought Plan screening and assessment results

This section presents the results of the WFD screening and compliance assessments. The individual WFD assessment tables for each option variant are provided in the Appendix.

3.1 WFD screening

3.1.1 WFD screening of demand side options

Table 3.1 shows the results of the WFD screening for the demand management options. These options have been screened out of any further assessment as there is no risk of deterioration in WFD status as a result of their implementation.

Table 3.1 Demand management options screened out for WFD compliance assessment

Drought Measure Name	Water Body Name	Water Body Code	Water Body Type	Reason for scoping out of Assessment:
Media /water efficiency campaigns	n/a	n/a	n/a	No risk of deterioration in WFD status. Decreased consumer demand will have a net positive effect by reducing pressures on water resources and reducing the need for abstraction from water sources.
Enhanced leakage reduction	n/a	n/a	n/a	No risk of deterioration in WFD status. Decreased consumer demand will have a net positive effect by reducing pressures on water resources and reducing the need for abstraction from water sources.
Temporary Use Ban	n/a	n/a	n/a	No risk of deterioration in WFD status. Decreased consumer demand will have a net positive effect by reducing pressures on water resources and reducing the need for abstraction from water sources.
Drought Order to ban prescribed non-essential water uses	n/a	n/a	n/a	No risk of deterioration in WFD status. Decreased consumer demand will have a net positive effect by reducing pressures on water resources and reducing the need for abstraction from water sources.
Emergency Drought Order restrictions	n/a	n/a	n/a	No risk of deterioration in WFD status. Decreased consumer demand will have a net positive effect by reducing pressures on water resources and reducing the need for abstraction from water sources.

3.1.2 WFD Screening of supply-side options

Table 3.2 shows the results of the WFD screening for the supply-side options (excluding drought permits or orders). Three supply-side options have been screened in for further assessment:

- Emergency Desalination – Sandown, Isle of Wight
- Emergency Desalination - Littlehampton
- Emergency Desalination - Sheerness, Isle of Sheppey

These results are discussed in Section 3.2 and the WFD compliance tables are provided in the Appendix.

Table 3.2 Supply-side options screened out for WFD compliance assessment

Drought measure name	Water body name	Water body code	Water body type	Reason for scoping out of assessment:
Additional import from Portsmouth Water to Hampshire Southampton East Water Resource Zone	River Itchen	GB107042022580	River	Abstraction to provide this import would be within existing abstraction licence limits with no known adverse effects on WFD status of the River Itchen or Southampton Water WFD water bodies
	Southampton Water	GB520704202800	Transitional Water	
Additional import from Portsmouth Water to support Sussex North Water Resource Zone	Various different sources	Various different sources	River or Groundwater	The drought measure involves a 15MI/d bulk import from Portsmouth Water. The water could come from any existing source within Portsmouth Water's supply area. The abstraction will be within existing abstraction licence conditions and through an existing transfer pipeline, with no known adverse effects on WFD status of any water body.
Rest Weir Wood reservoir source during early stages of drought	Weir Wood Reservoir	GB30644310	Lake	There will be a small, temporary beneficial effect to water levels in Weir Wood Reservoir. Therefore, there is no risk of deterioration in WFD status.
Tankering of water (emergency only)	Various different sources	Various different sources	River or Groundwater	This drought management measure involves the emergency tankering of water from existing water sources where there is a surplus of water supplies (this may be outside of the Southern Water supply area in severe drought). It is unlikely to lead to a risk of deterioration in WFD status in view of the volumes involved and given that the water would be from sources with spare resource availability against the source abstraction licence limits.
Rest Groundwater Sources: Isle of Wight (IOW) Water Resource Zone	IOW Solent Group	GB407002G501000	Groundwater	This drought management measure is an operational strategy to limit the use of groundwater sources as much as possible during the early stages of drought so that groundwater storage is conserved for later abstraction as a drought intensifies. The measure would provide a low temporary benefit of less than 1MI/d. Therefore, there is no risk of deterioration in the groundwater body, dependent surface water bodies or GWDTEs.
	IOW Central Downs Chalk	GB40701G503200		
	IOW Lower Greensand	GB40701G502900		
	IOW Southern Downs Chalk	GB40701G502800		
Rest Groundwater Sources: Worthing Sussex Water Resource Zone	Worthing chalk	GB40701G505300	Groundwater	This drought management measure is an operational strategy to limit the use of groundwater sources during the early stages of drought so that groundwater storage is conserved for later abstraction as a drought intensifies. Therefore, there is no risk of deterioration in the groundwater body, dependent surface water bodies or GWDTEs.
	Sussex Lambeth Group	GB40701G505100		

3.1.3 WFD Screening of Drought Permits and Orders

All Drought Permits and Orders were screened in for further assessment due to the risk of temporary WFD deterioration. These results are discussed in Section 3.2 and the WFD compliance tables are provided in the Appendix.

3.2 WFD compliance assessment summary of supply-side options

This section presents the summary results of the WFD assessments. The Appendix presents the individual detailed WFD assessment tables. The hydrological impact for each water body associated with the drought plan measure and details on the WFD water bodies scoped in for assessment are identified.

Table 3.1 summarises the water bodies that have not been scoped for further assessment for each option variant due to the initial screening assessment indicating no likely risks of WFD deterioration (taking account of WFD considerations in the associated Environmental Assessment Reports). Details of the scoping decisions are provided in the Appendix.

Table 3.2 shows the conclusions of the WFD assessment for each supply-side option. It can be seen that several of the options are at temporary risk of being non-compliant with the Objective 1 which relates to the risk of deterioration in status of the water body. All of the impacts are considered to be short-term, temporary and reversible.

Some option variants do not comply with Objective 5 relating to the attainment of objectives for Protected Areas. This is generally due to the potential risk of temporary impacts on Natura 2000 sites as a result of the implementation of the drought order or permit – these have been subject to more detailed assessment under the HRA process (see accompanying HRA report).

For Objectives 2 and 3 relating to the creation of no impediments for achieving good ecological status (or potential) and not compromising water body objectives: all of the drought orders and permits were compliant because all of the impacts are considered to be short-term, temporary and reversible. The same is true for Objective 6 relating to ensuring no hindrance to measures to address priority substances, priority hazardous substances and other pollutants.

Where a risk of temporary deterioration in WFD status has been identified, this will be discussed with the Environment Agency in the event that the drought plan measure needs to be implemented in a future drought. The risks to WFD compliance will also be further assessed at this time to take account of any new evidence from the baseline Drought Plan monitoring programme and any WFD monitoring carried out by the Environment Agency.

In respect of the WFD compliance risks associated with the Test Surface Water Drought Permit, this has been updated following the Hampshire Abstraction Licences Public Inquiry held in March 2018 and the agreement reached between Southern Water and the Environment Agency as part of the inquiry process and formalised in an operating agreement under Section 20 of the Water Resources Act 1991 (Section 20 Agreement). In the event that monitoring of the Lower River Test concludes that the Drought Permit implementation may lead to a temporary deterioration in the Water Framework Directive status of the River Test, then it is agreed in principle within the Section 20 Agreement, that the provisions of Article 4(6) of the Water Framework Directive, can be used to enable the granting of a Test Surface Water Drought Permit authorising abstraction below 355 MI/d and that low flows on the River Test between 355MI/d and 265 MI/d are also capable of

constituting exceptional circumstances for the purpose of Article 4(6) of the Water Framework Directive. Article 4(6) of the WFD details the circumstances in which temporary deteriorations do not amount to breaches of the requirements of the Directive.

While not wanting to fetter the Environment Agency's discretion, it is presumed by Southern Water that on the basis of this principle in relation to Article 4 (6) having been agreed with the Environment Agency for the Test Surface Water Drought Permit application, the Environment Agency would support (or at least not oppose) this same principle being presented by Southern Water in any Test Surface Water Drought Order application to the Secretary of State; and that low flows on the River Test of between 265 MI/d and 200 MI/d may equally be capable of constituting exceptional circumstances for the purposes of Article 4(6) of the Water Framework Directive. It is acknowledged that acceptance of this principle in a Test Surface Water Drought Order application would be at the discretion of the Secretary of State. Southern Water would seek to secure the support of the Environment Agency prior to submission of a Test Surface Water Drought Order as part of its pre-application consultations.

Table 3.1 WFD water bodies not scoped in for further assessment for Drought Permit / Orders

Drought Permit/Order	Water body name	Water body code	Water body type	Scoped in?
Weir Wood Reservoir - reduce compensation flow (Summer: 5.4MI/d)	Mid Medway from Eden Confluence to Yalding	GB106040018370	River	No
Weir Wood Reservoir - reduce compensation flow (Summer: 5.4MI/d)	Weir Wood Reservoir	GB30644310	Lake	No
Weir Wood Reservoir - reduce compensation flow (Winter: 3.6MI/d)	Mid Medway from Eden Confluence to Yalding	GB106040018370	River	No
Weir Wood Reservoir- reduce compensation flow (Winter: 3.6MI/d)	Weir Wood Reservoir	GB30644310	Lake	No
Darwell Reservoir- reduce MRF (Summer: 18.5MI/d)	Rother	GB540704016100	Transitional	No
Darwell Reservoir - reduce MRF Freshet volume (500MI/d)	Lower Rother from Etchingham to Scot's Float	GB107040013640	River	No
Darwell Reservoir - reduce MRF Freshet volume (500MI/d)	Rother	GB540704016100	Transitional	No
Powdermill Reservoir - reduce MRF Summer: 4.2MI/d	Powdermill Reservoir	GB30745011	Lake	No
Pulborough– (10MI/d Summer)	Western Rother	GB107041012810	River	No
Pulborough – (10MI/d Summer)	Arun	GB540704105000	Transitional	No
Pulborough – (20MI/d Summer)	Western Rother	GB107041012810	River	No
Pulborough – (20MI/d Summer)	Arun	GB540704105000	Transitional	No
Pulborough – (10MI/d Winter)	Western Rother	GB107041012810	River	No
Pulborough – (10MI/d Winter)	Arun	GB540704105000	Transitional	No
Pulborough – (20MI/d Winter)	Western Rother	GB107041012810	River	No
Pulborough – (20MI/d Winter)	Arun	GB540704105000	Transitional	No
River Medway Scheme - Stages 1 to 3	Bewl	GB106040018500	River	No
River Medway Scheme - Stages 1 to 3	Teise at Lamberhurst	GB106040018520	River	No
River Medway Scheme - Stages 1 to 3	Teise and Lesser Teise	GB106040018260	River	No

Drought Permit/Order	Water body name	Water body code	Water body type	Scoped in?
River Medway Scheme - Stages 1 to 3	Beult at Yalding	GB106040018140	River	No
North Arundel WSW - increase abstraction to 7MI/d	Arun	GB540704105000	Transitional	No
East Worthing WSW - increase abstraction to 7MI/d	Teville Stream	GB107041011940	River	No
Test Valley site WSW - Re-commissioning of unlicensed source	Test - conf Anton to conf Dun	GB107042022670	River	No
North Deal WSW - increase licensed volumes to 4MI/d	Nailbourne and Little Stour	GB107040019590	River	No
North Deal WSW - increase licensed volumes to 4MI/d	Ash Levels	GB107040019600	River	No
Stourmouth - reduce MRF (Summer: 45MI/d)	Stour (Kent)	GB520704004700	Transitional	No
Stourmouth - reduce MRF (Winter: 45MI/d)	Stour (Kent)	GB520704004700	Transitional	No
Candover Augmentation Scheme Drought Order – abstract 27 MI/d from Candover boreholes to augment River Itchen	Southampton Water	GB520704202800	Transitional	No
Lower Itchen Sources Drought Order – Reduce HOF to 160 MI/d	Bow Lake Stream	GB107042016650	River	No

Table 3.2 WFD assessment conclusions for supply-side options and Drought Permit / Orders (scoped in)

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
Weir Wood Reservoir - reduce compensation flow (Summer: 5.4M/d)	Medway at Weir Wood	GB106040018070	River	Yes	No; there is a high risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is risk of impacting downstream water body GB106040018181.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Weir Wood Reservoir - reduce compensation flow (Summer: 5.4M/d)	Mid Medway from Hartfield to Eden Confluence	GB106040018181	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; the impact on downstream water body GB106040018182 is negligible.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Weir Wood Reservoir - reduce compensation flow (Winter: 3.6M/d)	Medway at Weir Wood	GB106040018070	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream water body GB106040018181.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Weir Wood Reservoir - reduce compensation flow (Winter: 3.6M/d)	Mid Medway from Hartfield to Eden Confluence	GB106040018181	River	Yes	No; there is a low risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; the impact on downstream water body GB106040018182 is negligible.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Darwell Reservoir - reduce MRF (Spring: 30M/d)	Lower Rother from Etchingam to Scots Float	GB107040013640	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is risk of impacting downstream water body GB540704016100.	Yes; complies with WFD objective. (Annex 13: No; there is a risk of impact on Dungeness, Romney Marsh and Rye Bay SPA)	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
Darwell Reservoir - reduce MRF (Spring: 30MI/d)	Rother	GB540704016100	Transitional	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective. (Annex 13: No; there is a risk of impact on Dungeness, Romney Marsh and Rye Bay SPA)	Yes; complies with WFD objective.
Darwell Reservoir - reduce MRF (Spring: 30MI/d)	Darwell Reservoir	GB30744955	Lake	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting the drinking water protected area:	Yes; complies with WFD objective.
Darwell Reservoir - reduce MRF (Summer: 18.5MI/d)	Lower Rother from Etchingam to Scots Float	GB107040013640	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is risk of having a minor impact on the downstream water body GB540704016100.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Darwell Reservoir - reduce MRF (Summer: 18.5MI/d)	Darwell Reservoir	GB30744955	Lake	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting the drinking water protected area	Yes; complies with WFD objective.
Darwell Reservoir - reduce MRF Freshet volume (500MI/d)	Darwell Reservoir	GB30744955	Lake	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting the drinking water protected area:	Yes; complies with WFD objective.
Powdermill Reservoir - reduce	Brede	GB107040013550	River	Yes	No; there is a medium risk of temporary	Yes; complies	Yes; complies	No; there is risk of impacting	Yes; complies with WFD	Yes; complies

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
MRF Summer: 4.2M/d					deterioration in status.	with WFD objective.	with WFD objective.	downstream water body GB540704016 100.	objective. (Annex 13: No; there is a risk of impact on Dungeness, Romney Marsh and Rye Bay SPA)	with WFD objective.
Powdermill Reservoir - reduce MRF Summer: 4.2M/d	Rother	GB540704016100	Transitional	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective. (Annex 13: No; there is a low risk of impacting the Dungeness, Romney Marsh and Rye Bay SPA)	Yes; complies with WFD objective.
Pulborough– (30M/d Summer)	Western Rother	GB107041012810	River	Yes	No; there is a high risk of temporary deterioration in status due to impacts on some fish species.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a high risk of impacting downstream water body GB540704105 000	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Pulborough– (30M/d Summer)	Arun	GB540704105000	Transitional	Yes	No; there is a high risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Pulborough– (30M/d Winter)	Western Rother	GB107041012810	River	Yes	No; there is a high risk of temporary deterioration in status due to impacts on some fish species.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a high risk of impacting downstream water body GB540704105 000	Yes; complies with WFD objective.	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
Pulborough– (30M/d Winter)	Arun	GB540704105000	Transitional	Yes	No; there is a medium risk of temporary deterioration in status due to impacts on fish, invertebrate and macroalgal communities.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Eastern Yar Augmentation Scheme - Summer: 1M/d (Shide + Blackwater)	Medina	GB107101005990	River	Yes	No; there is a high risk of temporary deterioration in status due to its impacts on the fish community.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is risk of impacting downstream water body GB520710101600	No; potential risk of impacting on Solent and Southampt on Water SPA and Solent Maritime SAC.	Yes; complies with WFD objective.
Eastern Yar Augmentation Scheme - Summer: 1M/d (Shide + Blackwater)	Medina	GB520710101600	Transitional	Yes	No; there is a high risk of temporary deterioration in status due to its impacts on the fish community.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; potential risk of impacting on Solent and Southampt on Water SPA and Solent Maritime SAC.	Yes; complies with WFD objective.
Eastern Yar Augmentation Scheme -Winter: 1M/d (Shide + Blackwater)	Medina	GB107101005990	River	Yes	No; there is a high risk of temporary deterioration in status due to its impact on the fish community.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is risk of impacting downstream water body GB520710101600	No; potential risk of impacting on Solent and Southampt on Water SPA and Solent Maritime	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
									SAC. (Annex 13: Yes; complies with WFD objective)	
Eastern Yar Augmentation Scheme -Winter: 1MI/d (Shide + Blackwater)	Medina	GB520710101600	Transitional	Yes	No; there is a low risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; potential high risk of impacting on Solent and Southamt on Water SPA and Solent Maritime SAC.	Yes; complies with WFD objective.
River Medway Scheme - Stage 4	Bewl	GB106040018500	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream GB106040018520.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
River Medway Scheme - Stage 4	Teise at Lamberhurst	GB106040018520	River	Yes	No; there is a high risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream water body GB106040018260.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
River Medway Scheme - Stage 4	Teise and Lesser Teise	GB106040018260	River	Yes	No; there is a high risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream water body GB106040018140.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
River Medway Scheme - Stage 4	Bault at Yalding	GB106040018140	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream water body GB106040018130.	Yes; complies with WFD objective.	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
River Medway Scheme - Stages 1 to 3	Lower Teise	GB106040018130	River	Yes	No; there is a low risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream water body GB106040018130.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
River Medway Scheme - Stage 4	Lower Teise	GB106040018130	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream water body GB106040018130.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
River Medway Scheme - Stages 1 to 3	Medway at Maidstone	GB106040018440	River	Yes	No; there is a low risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting the downstream water body GB530604002300.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
River Medway Scheme - Stage 4	Medway at Maidstone	GB106040018440	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting the downstream water body GB530604002300.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
River Medway Scheme - Stages 1 to 3	Medway	GB530604002300	Transitional	Yes	No; there is a low risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
River Medway Scheme - Stages 1 to 5	Bewl Water	GB30644398	Lake	Yes	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
North Arundel WSW - increase abstraction to 7MI/d	Chichester Chalk	GB40701G505200	Groundwater	Yes	No; there is a medium (uncertain) risk of temporary deterioration in quantitative status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
East Worthing WSW - increase abstraction to 7MI/d	Worthing chalk	GB40701G505300	Groundwater	Yes	Yes; there is a negligible risk of temporary deterioration in quantitative and chemical status (within class).	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Test Valley site WSW – recommissioning of unlicensed source	River Test Chalk	GB40701G501200	Groundwater	Yes	No; there is a medium (uncertain) risk of temporary deterioration in quantitative and low risk for chemical status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Test Valley site WSW – recommissioning of unlicensed source	Wallop Brook	GB107042022650	River	Yes	No; there is a high risk of temporary deterioration in status due to its impact on the fish community.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Caul Bourne WSW - increase abstraction and reduce MRF	IOW Central Downs Chalk	GB40701G503200	Groundwater	Yes	No; there is a medium risk of temporary deterioration in quantitative status and low risk for chemical status (within class).	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there are surface water bodies that will be potentially impacted (GB107101006020 and GB520710101700).	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Caul Bourne WSW - increase abstraction and reduce MRF	Caul Bourne	GB107101006020	River	Yes	No; there is a high risk of temporary deterioration in status due to impacts on the fish community.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream transitional water body GB520710101700	No; potential risks to Solent and Southampton on Water SPA Solent Maritime SAC.	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
Caul Bourne WSW - increase abstraction and reduce MRF	Newtown River	GB520710101700	Transitional	Yes	No; there is a high risk of temporary deterioration in status due to impact on the fish community.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; potential risks to Solent and Southampton on Water SPA Solent Maritime SAC.	Yes; complies with WFD objective.
Shalcombe - licence variation	IOW Central Downs Chalk	GB40701G503200	Groundwater	Yes	No; there is a medium risk of temporary deterioration in quantitative status and low risk for chemical status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there are surface water bodies that will be potentially impacted (GB107101006020 and GB520710101700).	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Shalcombe WSW - licence variation	Caul Bourne	GB107101006020	River	Yes	No; there is a high risk of temporary deterioration in status, due to impacts on the fish community.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is risk of impacting downstream transitional water body GB520710101700	No; potential risks to Solent and Southampton on Water SPA Solent Maritime SAC.	Yes; complies with WFD objective.
Shalcombe WSW - licence variation	Newtown River	GB520710101700	Transitional	Yes	No; there is a high risk of temporary deterioration in status due to impacts on estuarine fish, invertebrate and macroalgal communities.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; potential risks to Solent and Southampton on Water SPA Solent Maritime SAC.	Yes; complies with WFD objective.
Faversham sources WSWs - removal of constraints	North Kent Swale Chalk	GB40601G501700	Groundwater	Yes	No; there is a low risk of temporary deterioration in quantitative status and medium risk	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there are surface water bodies that will be potentially impacted (GB106040018430,	Yes; complies with WFD objective.	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives						
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	
					for chemical status (within class).				GB107040019660 and GB530604011500).		
Faversham sources WSWs - removal of constraints	Len	GB106040018430	River	Yes	No; there is a low risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Faversham sources WSWs - removal of constraints	Upper Great Stour	GB107040019660	River	Yes	No; there is a low risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Faversham sources WSWs - removal of constraints	Swale	GB530604011500	Transitional	Yes	No; there is a low risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; there is a low risk of temporary deterioration in chemical status but unlikely to hinder measures for to address priority substances, priority hazardous substances and other pollutants.
Lukely Brook WSW - reduce MRF	IOW Central Downs Chalk	GB40701G503200	Groundwater	Yes	No; there is a medium risk of temporary deterioration in quantitative status and a medium risk of temporary deterioration in chemical	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is the potential to impact on associated surface water bodies water body GB107101006250 and GB520710101600.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives					
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
Lukely Brook WSW - reduce MRF	Lukely Brook	GB107101006250	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is the potential to impact the transitional water body downstream (GB520710101600)	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Lukely Brook WSW - reduce MRF	Medina	GB520710101600	Transitional	Yes	No; there is a medium risk of temporary deterioration in status, due to its impact on the fish community.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
North Deal - increase licensed volumes to 4MI/d	East Kent Chalk aquifer– Stour	GB40701G501500	Groundwater	Yes	No; there is a medium risk of temporary deterioration in quantitative status and medium risk for chemical status (within class).	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there are surface water bodies that will be potentially impacted (GB107040019570, GB107040019550 and GB107040019730).	Yes; complies with WFD objective.	Yes; complies with WFD objective.
North Deal WSW - increase licensed volumes to 4MI/d	North and South Streams at Eastry	GB107040019730	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; there is a risk of impacting downstream water body GB107040019550.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
North Deal WSW - increase licensed volumes to 4MI/d	North and South Streams in the Lydden Valley	GB107040019550	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
North Deal WSW - increase licensed volumes to 4MI/d	Wingham and Little Stour	GB107040019570	River	Yes	No; there is a medium risk of temporary	Yes; complies with WFD objective.	Yes; complies with WFD objective,	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives						
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	
					deterioration in status.						
Lower Itchen Sources	River Itchen Chalk	GB40701G505000	Groundwater	Yes	Yes; complies with WFD objective,	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Lower Itchen Sources	Itchen	GB107042022580	River	Yes	No; there is a medium risk of temporary deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; risks to the River Itchen SAC cannot be ruled out.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Lower Itchen Sources	Southampton Water	GB520704202800	Transitional Water	Yes	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Emergency Desalination - Sandown	Isle of Wight East	GB650705530000	Coastal	Yes	No; there is a medium risk of deterioration in status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Emergency Desalination - Littlehampton	Sussex	GB640704540003	Coastal	Yes	No; there is a low risk of deterioration in status. Further assessment is required.	Yes; complies with WFD objective.	No; it is uncertain whether the nearby mussel beds would be impacted by the discharge, which may interfere with the water body mitigation measures to "retain habitats".	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Emergency Desalination - Sheerness, Isle of Sheppey	Medway	GB530604002300	Transitional	Yes	No; there is a medium risk of deterioration in status. Further assessment is required of the brine discharge arrangements	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; potential risk to Medway Estuary and Marshes SPA and Thames Estuary and	Yes; complies with WFD objective.	Yes; complies with WFD objective.

Drought Plan Measure	Water body name	Water body code	Water body type	Scoped in?	WFD Objectives						
					Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	
					and mitigation that may be required.					Marshes SPA.	
Candover Augmentation Scheme Drought Order	River Itchen Chalk	GB40701G505000	Groundwater	Yes	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Candover Augmentation Scheme Drought Order	Candover Brook	GB107042022620	River	Yes	No; low risk of temporary deterioration to WFD status.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; risks to the River Itchen SAC cannot be ruled out.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Candover Augmentation Scheme Drought Order	Itchen	GB107042022580	River	Yes	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	No; risks to the River Itchen SAC cannot be ruled out.	Yes; complies with WFD objective.	Yes; complies with WFD objective.
Test Surface Water Drought Permit/Order	Test (Lower)	GB107042016840	River	Yes	No (uncertain). There is a low (but uncertain) risk of deterioration into WFD status. There is uncertainty due to lack of WFD monitoring sites downstream of the abstraction)#	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.			
Test Surface Water Drought Permit/Order	Southampton Water	GB520704202800	Transitional	Yes	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.	Yes; complies with WFD objective.

See commentary above in Section 3.2 in relation to the Test Surface Water Drought Permit

4 Cumulative assessment

The potential for cumulative effects between each supply-side and Drought Permit / Order drought management measure has been assessed. Options that have been assessed as having a temporary risk of deterioration on the same WFD water bodies as other drought management measures within the Drought Plan have been identified and grouped in **Table 4**. An assessment of the hydrological/hydrogeological impacts of the grouped options in combination with one another has then been carried out to determine whether this will increase the level of risk of temporary deterioration in WFD status. The findings from this cumulative assessment are summarised **Table 4**.

The Lukely Brook Drought Permit option in combination with the Eastern Yar Drought Order option could potentially lead to a slight increase in the overall impacts on the Medina transitional water body (GB520710101600) with the potential for a small increase in risk of temporary deterioration in WFD status. The Caul Bourne and Shalcombe Drought Order measures in combination with one another could increase the risk of temporary deterioration to the Isle of Wight Central Downs Chalk groundwater body (GB40701G503200) and its dependant surface water body, the Caul Bourne (GB107101006020).

The potential for cumulative effects on WFD water bodies between Southern Water's Drought Plan and other water company's previous published drought plans and Water Resources Management Plans has also been examined, along with other relevant plans and projects. The results of the assessment are shown in **Table 4.1**. The following drought management measure combinations have been assessed as having the potential to increase the risk of WFD temporary deterioration if implemented concurrently with the measures set out in the plans of other water companies:

- Weir Wood reservoir Drought Order (summer) and River Medway Scheme Stage 3 Drought Permit (summer) with Sutton and East Surrey Water's Bough Beech reservoir / River Eden Drought Permit
- North Arundel Drought Order with Portsmouth Water's "Source S" borehole Drought Permit.

Table 4.1 Cumulative effects assessment of drought measures within Southern Water's Drought Plan

Water body	Drought management measures	Hydrological/ hydrogeological cumulative assessment summary	Ecological cumulative assessment summary	Overall risk of temporary deterioration
Medina (GB520710101600)	Lukely Brook/ Eastern Yar (Winter)	The Lukely Brook and Eastern Yar (Winter) measures have a cumulative impact on the Medina (transitional water) into which they discharge. Lukely Brook is the smallest in terms of total discharge comparatively to the Medina, with a Q95 and Q99 approximately 10 times less than the Medina. Moderate hydrological impact to the already Major impact that may be caused by the Eastern Yar Augmentation Scheme.	Risk of deterioration could increase slightly to the Medina for macrophytes, macroalgae and phytoplankton, macroinvertebrates and freshwater fish due to further decrease in freshwater flow to the estuary but noting the large disparity between the flow contributions of the two rivers. Overall, cumulative risk of WFD deterioration is assessed as remaining as low.	Low (Medina transitional water body)
Medina (GB520710101600)	Lukely Brook / Eastern Yar (Summer)	The Lukely Brook and Eastern Yar (summer) measures have a cumulative impact on the Medina (transitional water) into which they discharge. Lukely Brook is the smallest in terms of total discharge comparatively to the Medina, with a Q95 and Q99 ~10 times less than the Medina. Moderate hydrological impact to the already Major impact that may be caused by the Eastern Yar Augmentation Scheme.	Risk of deterioration could increase slightly to the Medina for macrophytes, macroalgae and phytoplankton, macroinvertebrates and freshwater fish due to further decrease in freshwater flow to the estuary but noting the large disparity between the flow contributions of the two rivers. Overall, cumulative risk of WFD deterioration is assessed as high reflecting the high risk associated with the Eastern Yar option in isolation.	High (Medina transitional water body)
Caul Bourne (GB107101006020) / Newtown River (GB520710101700)	Caul Bourne / Shalcombe	The Shalcombe Stream flows into the Caul Bourne (GB107101006020) at Newbridge. The Caul Bourne flows into the Newtown River transitional water body (GB520710101700). Potential cumulative impacts due to the combined drought orders are expected to be moderate impact on flows in Caul Bourne. The reduction of freshwater flow into the Newtown River (GB520710101700) is only marginally greater with both drought orders implemented concurrently. Overall, there is a moderate hydrological cumulative impact to the river environment.	The moderate cumulative hydrological impacts would impact on the aquatic ecology with potential increase to the WFD deterioration risk from medium to high in the Caul Bourne for macrophytes, macroinvertebrates and fish. Cumulative risk to Newtown water body assessed as high reflecting the high risk for each option in isolation.	High (Caul Bourne) High (Newtown River)

Water body	Drought management measures	Hydrological/ hydrogeological cumulative assessment summary	Ecological cumulative assessment summary	Overall risk of temporary deterioration
IoW Central Downs Chalk (GB40701G503200)	Shalcombe / Caul Bourne / Lukely Brook	<p>The Shalcombe, Caul Bourne and Lukely Brook drought order/permit options may all have a cumulative impact on the IoW Chalk groundwater body (GB40701G503200) due to the additional abstraction of groundwater. Further to this, the surface water catchment of Lukely Brook is adjacent to that of Caul Bourne. It is noted that there is a risk of cumulative drawdown impacts in the radius of influence, but this is expected to be limited. Where the radius of influence overlaps between the drought permits, the cumulative impact will be more significant.</p> <p>Cumulative hydrogeological impact assessed as moderate which could increase the risk of deterioration specific to the quantitative water balance test.</p>	<p>Both Lukely Brook and Caul Bourne are at medium risk of temporary deterioration due to the potential impact on dependent water bodies and groundwater dependent terrestrial ecosystems, and consequently there is an increased (but uncertain) risk of WFD deterioration with these three drought orders/permits implemented concurrently. There is some uncertainty in this assessment due to the absence of a groundwater model to assess cumulative effects.</p>	High - uncertain (IoW Chalk)
Medway at Maidstone (GB106040018440) Medway Transitional (GB530604002300)	Weir Wood Reservoir (Winter) / River Medway Scheme (Winter Stage 1)	<p>The Weir Wood Reservoir (Winter) drought order and River Medway Scheme (Stage 1) drought permit would have a cumulative impact on the Medway at the confluence of the Teise/Beult at Yalding (Medway at Maidstone GB106040018182) and downstream to the Medway transitional water body (GB530604002300). However, due to the flow amelioration in the intervening River Medway catchment between Weir Wood reservoir and Yalding, the additional cumulative hydrological impact is expected to be negligible.</p>	<p>Due to the negligible additional cumulative hydrological impacts, impacts to the aquatic ecology would not increase as a result of these drought orders/permits being implemented in combination. The risk of deterioration would remain low due to the impacts of River Medway Scheme Stage 1 drought permit on the Medway at Maidstone (GB106040018182). Cumulative risks to WFD deterioration on the Medway transitional water body (GB530604002300) remain as low.</p>	Low (Medway at Maidstone; Medway Transitional)
Medway at Maidstone (GB106040018440) Medway Transitional (GB530604002300)	Weir Wood Reservoir (Winter) / River Medway Scheme (Winter Stage 2)	<p>The Weir Wood Reservoir (Winter) drought order and River Medway Scheme (Stage 2) drought permit would have a cumulative impact on the Medway at the confluence of the Teise/Beult at Yalding (Medway at Maidstone GB106040018182) and downstream to the Medway transitional water body (GB530604002300). However, due to the flow amelioration in the intervening River Medway catchment between Weir Wood reservoir and Yalding, the additional cumulative hydrological impact is expected to be negligible.</p>	<p>Due to the negligible additional cumulative hydrological impacts, impacts to the aquatic ecology would not increase as a result of these drought orders/permits being implemented in combination. The risk of deterioration would remain low due to the impacts of River Medway Scheme Stage 2 drought permit on the Medway at Maidstone (GB106040018182). Cumulative risks to WFD deterioration on the Medway transitional water body (GB530604002300) remain as low.</p>	Low (Medway at Maidstone; Medway Transitional)
	Weir Wood (Summer) / River Medway Scheme	<p>The Weir Wood Reservoir (summer) drought order and River Medway Scheme (Stage 3) drought permit would have a cumulative impact on the Medway at the confluence of the Teise/Beult at Yalding (Medway at Maidstone</p>	<p>Due to the negligible additional cumulative hydrological impacts, impacts to the aquatic ecology would not increase as a result of these drought orders/permits being implemented in</p>	Low (Medway at Maidstone;

Water body	Drought management measures	Hydrological/ hydrogeological cumulative assessment summary	Ecological cumulative assessment summary	Overall risk of temporary deterioration
	(Summer Stage 3)	GB106040018182) and downstream to the Medway transitional water body (GB530604002300). However, due to the flow amelioration in the intervening River Medway catchment between Weir Wood reservoir and Yalding, the cumulative impact is expected to be negligible.	combination. The risk of deterioration would remain low due to the impacts of River Medway Scheme Stage 3 drought permit on the Medway at Maidstone (GB106040018182). Cumulative risks to WFD deterioration in the Medway transitional water body (GB530604002300) remain as low.	Medway Transitional)
	Weir Wood (Winter) / River Medway Scheme (Winter Stage 4)	The Weir Wood Reservoir (Winter) drought order and River Medway Scheme (Stage 4) drought order would have a cumulative impact on the Medway at the confluence of the Teise/Beult in the vicinity of Yalding (Medway at Maidstone GB106040018182) and downstream to the Medway transitional (GB530604002300). However, due to the flow amelioration in the intervening River Medway catchment between Weir Wood reservoir and Yalding, the additional cumulative impact is expected to be negligible.	Due to the negligible additional cumulative hydrological impacts, impacts to the aquatic ecology would not increase as a result of these drought orders/permits being implemented in combination. The risk of deterioration would remain medium due to the impacts of River Medway Scheme Stage 4 drought order on the Medway at Maidstone (GB106040018182). Cumulative effects on the Medway transitional water body (GB530604002300). Cumulative risks to WFD deterioration on the Medway transitional water body (GB530604002300) remain as low.	Medium (Medway at Maidstone)
				Low (Medway Transitional)
Medway Transitional (GB530604002300)	Emergency Desalination - Sheerness, Isle of Sheppey / River Medway Scheme - Stages 1 to 4	The River Medway Scheme drought permits/order have a minor (Stages 1 to 3) or moderate (Stage 4) hydrological impact on the Medway transitional water body. The Emergency desalination plant at Sheerness would abstract water from the estuary and discharge brine. It is considered that the hydrological impacts of these two drought management measures being implemented in combination would not increase over and above that assessed for the River Medway Scheme drought permits/order.	The risk of WFD deterioration due to the drought permits/order is assessed as medium taking account of the low risk for the River Medway Scheme drought permits (Stages 1 to 3) and medium risk for the River Medway Scheme Stage 4 drought order. The potential risk to WFD status due to the brine discharge from the emergency desalination plant on WFD status is assessed as no greater than medium after taking account of mitigation measures to maximise dispersion of the brine discharge. Given the distance downstream of the temporary desalination plan within the Medway estuary it is considered that the risk of WFD deterioration is not increased above medium if both drought plan measures were to be implemented concurrently.	Medium (Medway Transitional)

Water body	Drought management measures	Hydrological/ hydrogeological cumulative assessment summary	Ecological cumulative assessment summary	Overall risk of temporary deterioration
Lower Rother from Etchingam to Scots Float (GB107040013640) and Rother Transitional Water Body (GB540704016100)	Darwell Reservoir Freshet Removal drought permit / Darwell Reservoir (Summer) drought order	The 'freshet' volume of water that is normally required to be held in reserve in Darwell Reservoir equates to 500MI. This drought permit would enable this 500 MI to instead be abstracted for public water supply. The permit is unlikely to have any hydrological impact on the downstream water bodies during a drought. Consequently, there is no cumulative hydrological impact between the Darwell 'freshet' removal drought permit and the Darwell reservoir drought order (spring or summer) to reduce the MRF in the River Rother at Robertsbridge.	Due to the lack of cumulative hydrological impacts, the impacts to the aquatic ecology would not increase due to the concurrent implementation of the Darwell Reservoir freshet drought permit with the Darwell Reservoir drought order. The cumulative risk to the ecological features would remain medium to the Lower Rother from Etchingam to Scot's Float (GB107040013640) and the Rother Transitional Water Body (GB540704016100).	Medium (Etchingam to Scots Float and Rother Transitional Water Body)
	Darwell Reservoir Freshet Removal drought permit / Darwell Reservoir (Spring) drought order		Due to the lack of cumulative hydrological impacts, the impacts to the aquatic ecology would not increase due to the concurrent implementation of the Darwell Reservoir freshet drought permit with the Darwell Reservoir drought order. The cumulative impact to the ecological features would remain as medium to the Lower Rother from Etchingam to Scot's Float (GB107040013640) and the Rother Transitional Water Body (GB540704016100).	Medium (Etchingam to Scots Float and Rother Transitional Water Body)
Rother Transitional Water Body (GB540704016100)	Darwell Reservoir (summer) drought order / Powdermill drought permit	The cumulative hydrological impact is dependent on the prevailing control of flows to the estuary in drought conditions from the freshwater river Rother, but it is likely that flow releases from the sluice gates to the estuary will already be low, and therefore the cumulative effects of the drought order and drought permit are no greater than when compared to only one of these drought management measures being implemented due to the flow control management.	No change to risk assessment for WFD deterioration for the Rother Transitional Water Body (GB540704016100), which is assessed as medium risk in summer.	Medium (Rother Transitional Water Body)
	Darwell Reservoir (spring) drought order / Powdermill drought permit	The cumulative hydrological impact is dependent on the prevailing control of flows to the estuary in drought conditions from the freshwater river Rother, but it is likely that flow releases from the sluice gates to the estuary will already be low, and therefore the cumulative effects of the drought order and drought permit are no greater than when compared to only one of these drought management measures being implemented due to the flow control management.	No change to risk assessment for WFD deterioration for the Rother Transitional Water Body (GB540704016100), which is assessed as medium risk in spring.	Medium (Rother Transitional Water Body)

Table 4.1 Cumulative effects assessment of Southern Water's drought management measures with other water company Drought Plan measures

Water body	Drought management measures	Hydrological/ hydrogeological cumulative assessment summary	Ecological cumulative assessment summary and risk to WFD deterioration
Mid Medway from Eden Confluence to Yalding (GB106040018182)	Weir Wood Reservoir (Summer) drought order/ Sutton and East Surrey Water Bough Beech River Eden drought order	The Sutton and East Surrey Water drought order for Bough Beech/River Eden is expected to have a negligible hydrological impact (if implemented in May only) and up to a moderate hydrological impact if implemented from June onwards. The hydrological impact of the Weir Wood summer drought order on the Mid Medway from Eden confluence water body is assessed as negligible. Consequently, cumulative hydrological impacts between Weir Wood Reservoir (summer) drought order and the Bough Beech/River Eden drought permit on the Mid Medway from Eden Confluence to Yalding (GB106040018182) will be no greater than that relating to the Bough Beech/River Eden drought order if implemented in isolation.	<p>No additional cumulative effects during summer on hydrology and ecology in and no change to the risk of WFD deterioration in relation to macrophytes, macroinvertebrates and fish.</p> <p>No additional cumulative risk to WFD deterioration for the Mid Medway from Eden Confluence to Yalding (GB106040018182) water body.</p>
Medway at Maidstone (GB106040018440) Medway Transitional (GB530604002300)	Weir Wood Reservoir (Summer) drought order / River Medway Scheme (Summer Stage 3) drought permit/ Sutton and East Surrey Water Bough Beech/River Eden Drought Order	Concurrent implementation of the Weir Wood Reservoir drought order, Sutton and East Surrey Water's Bough Beech/River Eden drought order and the River Medway Scheme drought permit would only occur during the summer period (May onwards). Impacts of the Weir Wood Reservoir summer drought order are negligible on these water bodies. Based on a possible abstraction in the region of 3.46Ml/d by Sutton and East Surrey Water under its drought order, river flows in the Eden upstream of the confluence with the Medway at Yalding may be reduced by ~17% and ~18% at Q99 and Q95 flows, respectively. The River Medway Scheme summer drought permit would reduce the MRF at Teston (in the Medway at Maidstone WFD water body) to 275Ml/d and reduce the river regulation flow requirement from Bewl Water Reservoir to the Medway. Given the dominant effect of the River Medway Scheme drought permit, the cumulative hydrological impact is assessed as no greater than the moderate hydrological impact assessed for the River Medway Scheme implemented on its own.	<p>The aquatic ecology could be impacted further due to the slightly lower flow (approximately a 7Ml/d further flow reduction compared to River Medway Scheme drought permit on its own) in the river system with all three drought permits/orders in place concurrently.</p> <p>Risk to WFD deterioration could potentially alter from low to medium risk for the Medway at Maidstone water body (GB106040018440) for macrophytes, macroalgae and phytoplankton, macroinvertebrates and fish.</p> <p>Cumulative risks to the Medway transitional water body (GB530604002300) considered unlikely to increase from the low risk assigned to the River Medway Scheme drought permit.</p>

Water body	Drought management measures	Hydrological/ hydrogeological cumulative assessment summary	Ecological cumulative assessment summary and risk to WFD deterioration
Chichester chalk groundwater body (GB40701G505200) and Arun Transitional water body (GB540704105000)	North Arundel drought order/ Portsmouth Water "Source S" borehole drought permit	<p>Portsmouth Water's "Source S" borehole drought permit may increase abstraction by 8.5MI/d from the licensed volume of 2.5MI/d. Cumulative hydrogeological effects may be major (but uncertain) as a consequence. Further monitoring/modelling is required to reduce this uncertainty.</p> <p>Cumulative effects may arise through increased groundwater level drawdown leading to reduced water levels in Swanbourne Lake, but this is not a WFD water body. Effects on Swanbourne Lake are uncertain and further monitoring/modelling is required to better understand the hydrogeological impacts, as it likely that the lake is dry prior to any drought permits being implemented, although recovery of water levels in the lake may take longer due to the drought permits being implemented.</p>	<p>Cumulative effects are uncertain but provisionally assessed as leading to a moderate risk (uncertain) of WFD deterioration on the Chichester Chalk groundwater body (GB40701G505200), taking account of the size of this groundwater body.</p> <p>Cumulative effects on the Arun Transitional water body (GB540704105000) are provisionally assessed as leading to a minor risk of WFD deterioration (uncertain).</p>
Medway Transitional (GB530604002300)	River Medway Scheme drought permits or order/ South East Water drought permit	The South East Water groundwater source near Rochester is located adjacent to the Medway Estuary transitional water body (GB530604002300) and has a hydraulic connection to the Grey Pit, which overflows into the Medway Marshes. However, this overflow is known to cease in summer. The hydrological impact of this drought permit on the Medway transitional water body is assessed as negligible and therefore there is no change to overall hydrological impact of the River Medway Scheme drought permits/order.	No additional cumulative risk to WFD deterioration for the Medway Transitional water body (GB530604002300)

5 Summary

The WFD assessment has concluded that:

- Several drought management measures were screened out of the WFD assessment as there was no risk of deterioration in WFD status. These included the demand-side measures and several supply-side measures such as resting the use of Weir Wood reservoir source during early stages of drought and resting certain groundwater sources during early stages of drought.
- Some supply-side drought management options and all of the Drought Permit / Order options were screened in for further assessment. This assessment indicated that several of the drought management options are at risk of being non-compliant with Objective 1 which relates to the risk of deterioration in status of the water body. However, all of the impacts are considered to be short-term, temporary and reversible. Importantly, no permanent risk of status deterioration has been identified. In some cases, these risks could be compounded by more than one option being implemented concurrently or being implemented at the same time as a drought permit relating to a neighbouring water company.
- Cumulative effects between some drought management measures within the Drought Plan and/or with other water company Drought Plan measures have been identified that may lead to an increased risk of WFD status deterioration. This applies to:
 - Drought Permit / Order options on the Isle of Wight
 - Weir Wood reservoir Drought Order (summer) and River Medway Scheme Stage 3 Drought Permit (summer) with Sutton and East Surrey Water's Bough Beech / River Eden Drought Permit
 - North Arundel Drought Order with Portsmouth Water's "Source S" borehole Drought Permit
- Several options may not meet Objective 5 relating to the attainment of objectives for Protected Areas on a temporary basis during implementation (Sheerness desalination plant option, Shalcombe, Caul Bourne, Eastern Yar (and Lukely Brook in combination with Eastern Yar), Candover Augmentation Scheme and the Lower Itchen sources Drought Order. This is primarily due to the potential impacts on Natura 2000 sites as a result of the implementation of the drought order or permit which are subject to more detailed assessment under the HRA process (see accompanying HRA report).

Where a risk of temporary deterioration in WFD status has been identified, this will be discussed with the Environment Agency in the event that the drought plan measure needs to be implemented in a future drought. The risks to WFD compliance will also be further assessed at this time to take account of any new evidence from the baseline Drought Plan monitoring programme and any WFD monitoring carried out by the Environment Agency.

In respect of the WFD compliance risks associated with the Test Surface Water Drought Permit, discussions took place with the Environment Agency as part of the Hampshire Abstraction Licences public inquiry process (March-April 2018). This resulted in an agreement being made under Section 20 of the Water Resources Act 1991 between Southern Water and the Environment Agency. The Section 20 Agreement was welcomed and supported by all major stakeholders. In the event that monitoring of the Lower River Test concludes that the Drought Permit implementation may lead to a temporary deterioration in the Water Framework Directive status of the River Test,

then it is agreed in principle within the Section 20 Agreement, that the provisions of Article 4(6) of the Water Framework Directive, can be used to enable the grant of a Test Surface Water Drought Permit authorising abstraction below 355 Ml/d and that low flows on the River Test between 355Ml/d and 265Ml/d are also capable of constituting exceptional circumstances for the purpose of Article 4(6) of the Water Framework Directive. Article 4(6) of the WFD details the circumstances in which temporary deteriorations do not amount to breaches of the requirements of the Directive.