



Ricardo  
Energy & Environment



---

## Bristol Water Drought Plan 2018 Strategic Environmental Assessment Environmental Report

Report for Bristol Water Plc

**Customer:**

**Bristol Water Plc**

**Customer reference:**

**3500035354**

**Confidentiality, copyright & reproduction:**

This report is the Copyright of Bristol Water. It has been prepared by Ricardo Energy & Environment, a trading name of Ricardo-AEA Ltd, under contract to Bristol Water Plc dated 11/11/2016. The contents of this report may not be reproduced in whole or in part, nor passed to any organisation or person without the specific prior written permission of Bristol Water. Ricardo Energy & Environment accepts no liability whatsoever to any third party for any loss or damage arising from any interpretation or use of the information contained in this report, or reliance on any views expressed therein.

**Contact:**

Ed Fredenham  
Ricardo Energy & Environment  
G2 Bristol & Exeter House, Lower Approach  
Road, Temple Meads, Bristol. BS1 6QS.

**t:** +44 (0) 117 954 4825

**e:** ed.fredenham@ricardo.com

**Author:**

Ed Fredenham and Shawn Beatson

**Approved By:**

John Sanders

**Date:**

21/06/2018

**Ricardo Energy & Environment reference:**

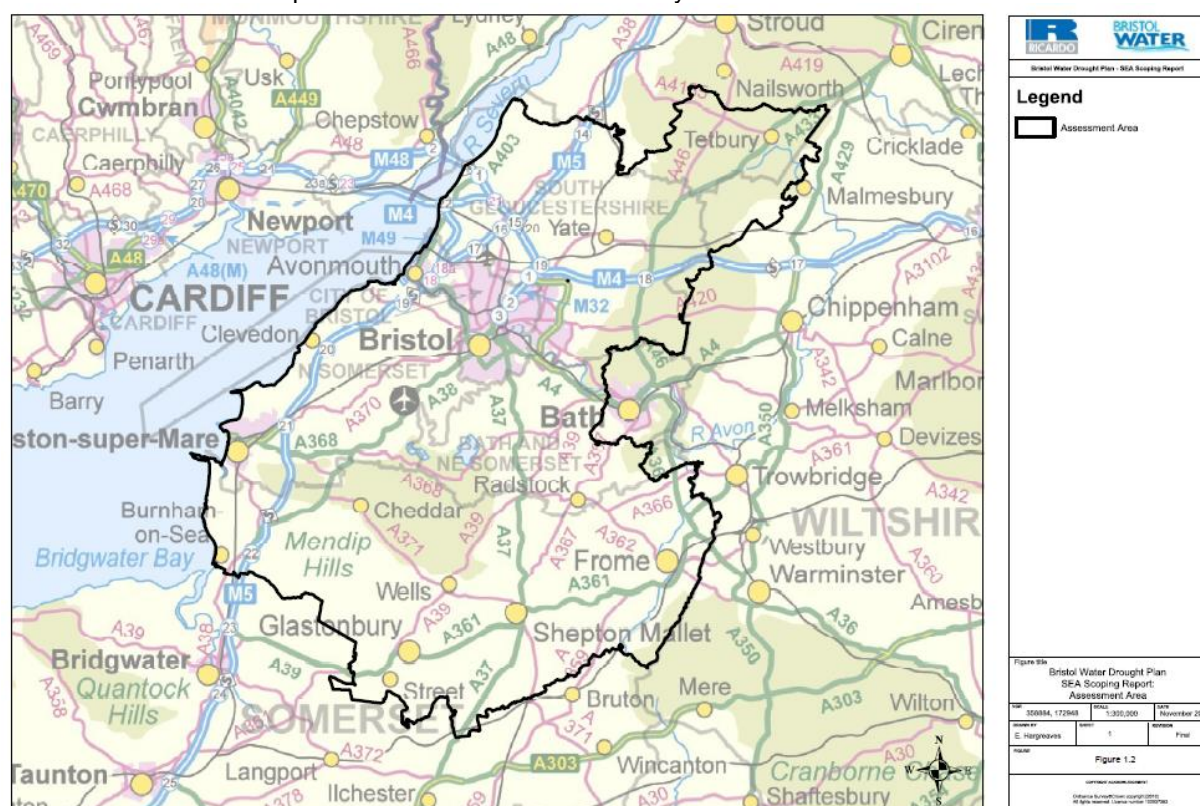
Ref: ED62965- Issue Number 4

# Non-Technical Summary

## Objectives of the plan and summary of the SEA process

Under the Water Industry Act 1991, Bristol Water Plc is required to prepare and update a Drought Plan and make the draft plan available for public consultation. The Drought Plan provides a comprehensive statement of the actions Bristol Water will consider implementing during drought conditions to safeguard essential water supplies to customers and minimise environmental impact. It is consistent with Bristol Water's Water Resources Management Plan, the objective of which is to set the strategic plan for ensuring a supply-demand balance over a 25 year planning period. This Strategic Environmental Assessment (SEA) has been undertaken on Bristol Water's Drought Plan 2017 and has been subject to public consultation alongside consultation on the draft Drought Plan.

The spatial scope of the SEA is identified by the black border in the map below – all reported effects would be limited to this spatial area with no trans-boundary effects identified from the assessment.



SEA is a statutory requirement under the European Directive 2001/42/EC for certain plans and programmes, as transposed into national legislation by the Environmental Assessment of Plans and Programmes Regulations 2004. The purpose of SEA is to provide high level and strategic protection of the environment by incorporating environmental considerations into the preparation of plans, programmes and policies. An SEA Scoping Report was issued in November 2016, and provided an opportunity for the statutory consultees to provide views on the proposed scope and level of detail of this SEA Environmental Report. Issues raised by consultees have been considered in preparing this report.

The SEA provides information on the relative environmental performance of alternative options considered for the Bristol Water Drought Plan to support decision-making on the development of the plan. In particular, the SEA has been used to inform the relative timing of implementing different management measures within the Drought Plan. The findings of the SEA, and how it has informed the development of the Drought Plan, are presented within this Environmental Report.

Bristol Water has also undertaken a Habitats Regulations Assessment (HRA) of its Drought Plan, which has been carried out in parallel with the SEA and is reported separately in the HRA Screening Report. The HRA screening process identified whether any of the potential drought plan options (either alone or in combination with other plans or projects) is likely to have any significant effects on the integrity of any European sites designated for their conservation importance. The findings of the HRA have fed into the SEA Environmental Report. Similarly, consideration of the implications of relevant drought management options on Water Framework Directive compliance have informed development of the SEA Environmental Report and the Drought Plan.

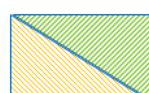
### Overall approach to the SEA

The assessment of the drought management options has been 'objectives-led'. SEA objectives have been derived from a comprehensive review of environmental objectives established in law, policy or other plans and programmes, as well as from a review of baseline relevant environmental and social information. The SEA objectives have been categorised under the following topic areas: biodiversity, flora and fauna; population and human health; material assets and resource use; water; soil, geology and land use; air and climate; archaeology and cultural heritage; and landscape and visual amenity. The overall findings of the SEA describe the assessment of beneficial and adverse effects of each potential drought management measure against the objectives set for each topic.

The outputs of the assessment are a completed appraisal framework table for each drought management measure, and a colour coded summary matrix (ranging from major beneficial to major adverse effects) which provides a comparative assessment of the residual environmental effects of implementing each drought management measure (i.e. those effects remaining after the implementation of mitigation measures), as shown in the figure below.

### Significance of effect matrix

Significance of Effect		Value/sensitivity of receptor		
		High	Medium	Low
Effect magnitude (includes scale of effect)	High	Major Beneficial Major Adverse	Major Beneficial Major Adverse	Moderate Beneficial Moderate Adverse
	Medium	Major Beneficial Major Adverse	Moderate Beneficial Moderate Adverse	Minor Beneficial Minor Adverse
	Low	Minor Beneficial Minor Adverse	Minor Beneficial Minor Adverse	Negligible



= Significance of effect dependent on value/sensitivity of receptor and magnitude

A cumulative, or in-combination, assessment has also been undertaken which has involved examining the likely effects of each of the drought management measures in combination as well as the assessment of potential effects between the Drought Plan and other relevant plans and programmes.

## Summary of findings and likely effects of the plan or programme

Objectives		SEA Topic															
		Biodiversity, fauna and flora		Population and human health			Material assets and resource use		Water			Soil, geology and land use	Air and Climate			Archaeology and cultural heritage	Landscape and visual amenity
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	5.1	6.1	6.2	6.3	7.1	8.1
Appeals for restraint	Adverse																
	Beneficial																
Enhanced leakage management	Adverse																
	Beneficial																
Temporary Use Ban (TUB)	Adverse																
	Beneficial																
Drought Order to prohibit prescribed non-essential water uses (NEUB)	Adverse																
	Beneficial																
Emergency Drought Order	Adverse																
	Beneficial																
Honeyhurst and Rodney Stoke (Well Head)	Adverse																
	Beneficial																
Reduction in compensation flow release from Blagdon Reservoir	Adverse																
	Beneficial																
Reduction in compensation flow release from Chew Reservoir	Adverse																
	Beneficial																
Reduction of prescribed flow at Cheddar Reservoir	Adverse																
	Beneficial																

Colour	Significance of Effect
Dark Green	Major Beneficial
Mid Green	Moderate Beneficial
Light Green	Minor Beneficial
Pale blue	Negligible
Yellow	Minor Adverse
Orange	Moderate Adverse
Red	Major Adverse
NONE	NOT APPLICABLE

Overall, measures included in the Drought Plan to reduce demand for water serve to reduce pressure on limited water resources during a drought by reducing amount of water required to be abstracted from the water environment. Demand management measures typically provide moderate beneficial effects such as helping to protect and enhance health and well-being through maintaining water supplies for essential use, and promoting efficient and sustainable use of water. Major adverse effects have been identified with respect to demand management measures that prohibit a wide range of non-essential water uses (adverse effects on the local economy and certain water-dependent businesses) and the potential application of an Emergency Drought Order (adverse effects on the wider population and businesses across the Bristol Water supply area).

Four options to temporarily augment water supplies in a drought have been considered within the SEA. One option involves bringing the Honeyhurst and Rodney Stoke (Well Head), also known as Honeyhurst Well source, back into use: the assessment has indicated the potential for adverse effects on surface waters (River Axe) is low and there is unlikely to be any compliance risks associated with the Water Framework Directive. There are some construction requirements associated with this option for which specific mitigation measures have been considered in order to avoid any potential adverse effects on designated European Sites and archaeological and cultural heritage remains. Moderate adverse effects of implementing this measure are likely in relation to carbon emissions associated with the construction and water pumping during operation. The option would deliver additional water supplies, and therefore moderate beneficial effects are identified in terms of protecting the public health and well-being of the population served by Bristol Water.

Moderate adverse effects have been predicted for all three of the drought permit options identified for inclusion in the Drought Plan (reduction of compensation water flow release from Blagdon Reservoir, Chew Reservoir and Cheddar Reservoir). These relate to effects on river levels, wetted width and flows

in the upper river reaches downstream of the reservoirs under low flow conditions. The river flow and level impacts are predicted to result in moderate adverse effects in relation to local biodiversity, flora and fauna; the local water environment; and local landscape and visual amenity. The adverse effects reduce with increasing distance downstream and become negligible downstream of key confluences with other rivers. Moderate beneficial effects are identified for all three of the drought permit options in terms of helping to conserve scarce water resources to protect public health and well-being of the population served by Bristol Water. Minor to negligible effects have been assessed in relation to all other SEA topic areas.

No significant adverse effects have been identified as a result of cumulative effects of each of the options being implemented at the same time, or with respect to other plans and programmes.

### **Mitigation and Monitoring**

Consideration of mitigation measures has been an integral part of the SEA process. The SEA appraisals has been based on assessing the residual impacts of the different drought management options, i.e. those impacts likely to remain after the implementation of applicable mitigation measures (as detailed in **Appendix F**). Mitigation measures include adopting best practice construction methods for laying of new pipelines to avoid noise and dust nuisance, runoff of sediment to nearby streams and preventing pollution from plant and machinery; they also include carrying out monitoring of sensitive environments before commencing operational changes so that appropriate protection measures can be agreed to safeguard sensitive species or features.

During implementation of any of the drought management measures, appropriate monitoring will be undertaken to track any potential effects on the environment and/or society, which will in turn trigger deployment of suitable and practicable mitigation measures. Prior to implementation of measures likely to affect the environment, Bristol Water will review the specific requirements for any environmental monitoring in consultation with the Environment Agency and Natural England.

### **Informing the development of the Drought Plan**

The findings of the SEA Environmental Report (and associated Habitats Regulations Assessment) have been used by Bristol Water to help inform the development of its Drought Plan. The scale and magnitude of adverse and beneficial effects identified by the SEA for each potential drought management measure has been used to determine the phasing and timing of the implementation of each measure against a series of drought management triggers based on reservoir storage levels. Those measures identified by the SEA as having mostly minor adverse effects have been selected by Bristol Water to be implemented ahead of those measures identified with more significant adverse effects.

### **Consultation**

This SEA Environmental Report was issued at the same time as the draft Drought Plan for public consultation. Comments have been received through this consultation process and the Environmental Report has been updated accordingly. The consultation comments and the responses are presented in the Drought Plan Statement of Response.



# Table of Contents

<b>1</b>	<b>Introduction.....</b>	<b>1</b>
1.1	Background and Purpose of Report .....	1
1.2	Application of SEA to Drought Planning.....	1
1.2.1	Overview of Strategic Environmental Assessment .....	1
1.2.2	Requirement for SEA and HRA of Bristol Water's Drought Plan .....	2
1.2.3	Applying Strategic Environmental Assessment to Drought Planning .....	4
1.3	Bristol Water's Water Supply System, Water Resource Management and Drought Planning .....	5
1.3.1	Introduction .....	5
1.4	Bristol Water's Drought Planning Process and Drought Management Options .....	7
1.4.1	Overview and Timetable of Drought Planning Process .....	7
1.4.2	Bristol Water's Drought Management Options .....	7
	Demand management options .....	7
	Supply augmentation options .....	9
	Defining the list of alternative drought management options .....	10
	Supporting Information .....	10
1.5	Stages of SEA Process .....	11
1.6	Structure of the Environmental Report .....	12
1.7	Consultation Process .....	13
1.7.1	Overview .....	13
1.7.2	Consultation on the Scoping Report .....	13
1.7.3	Consultation on the Environmental Report .....	13
<b>2</b>	<b>Policy context .....</b>	<b>14</b>
2.1	Introduction .....	14
2.2	Review of Policies, Plans and Programmes .....	14
<b>3</b>	<b>Environmental Baseline Review.....</b>	<b>31</b>
3.1	Introduction .....	31
3.1.1	Limitations of the data and assumptions made .....	31
3.2	Key Issues .....	31
3.2.1	Biodiversity, fauna and flora .....	31
3.2.2	Population and Human Health .....	32
3.2.3	Material Assets and Resource Use .....	32
3.2.4	Water .....	32
3.2.5	Soil, Geology and Land Use .....	33
3.2.6	Air and Climate .....	33
3.2.7	Archaeology and Cultural Heritage .....	33
3.2.8	Landscape and Visual Amenity.....	33
<b>4</b>	<b>Methodology .....</b>	<b>34</b>
4.1	Overview.....	34
4.2	Assessment Framework .....	44
4.2.1	Primary Assessment.....	44
	General Significance Definitions .....	49
	Summarising the effects assessment .....	50
4.3	Secondary, Cumulative and Synergistic Environmental Effects .....	50
<b>5</b>	<b>Assessment of Drought Options.....</b>	<b>52</b>
5.1	Drought Plan Options Under Consideration .....	52
5.2	Assessment of Options against SEA Objectives.....	52
5.3	Demand Management Options .....	52
5.4	Honeyhurst Well Option .....	54
5.5	Drought Permit Options .....	54
5.6	Habitats Regulations Assessment .....	58
5.7	Water Framework Directive Assessment .....	58

5.8	Role of the SEA in developing the Drought Plan .....	60
<b>6</b>	<b>Cumulative Assessment.....</b>	<b>62</b>
6.1	Introduction .....	62
6.2	Demand Management Options .....	62
6.2.1	Cumulative effects of demand management options .....	62
6.2.2	Cumulative effects with supply augmentation and drought permit options .....	62
6.3	Cumulative Effects Between Supply Augmentation and Drought Permit Options .....	62
6.4	Cumulative Effects with Existing Relevant Plans, Programmes and Projects .....	64
6.4.1	Environment Agency Drought Plans.....	64
6.4.2	Other Water Company Drought Plans .....	64
	Wessex Water 64	
	Severn Trent Water.....	65
	Thames Water 65	
6.4.3	Water Resource Management Plans .....	65
	Bristol Water 65	
	Wessex Water 65	
	Severn Trent 65	
	Thames Water 65	
6.4.4	Other Plans and Projects .....	65
	River Basin Management Plans .....	65
	National Policy Statements .....	66
6.4.5	Cumulative effects with any other identified relevant projects .....	66
<b>7</b>	<b>Mitigation and Monitoring .....</b>	<b>67</b>
7.1	Overview.....	67
7.2	Mitigation Measures .....	67
7.3	Monitoring Requirements .....	68
<b>8</b>	<b>Quality Assurance .....</b>	<b>69</b>

## Appendices

Appendix A	Maps of Key Interest Features
Appendix B	Drought Permits: Hydrological Zones of Influence
Appendix C	Consultee Responses to the Scoping Report and Amendments Made as a Consequence
Appendix D	Review of Policies, Plans and Programmes
Appendix E	Environmental Baseline
Appendix F	Assessment Matrices
Appendix G	WFD summary tables
Appendix H	Quality Assurance Checklist



# 1 Introduction

## 1.1 Background and Purpose of Report

Under the Water Industry Act 1991, Bristol Water Plc is required to prepare and update a Drought Plan and make the draft plan available for public consultation. The Drought Plan provides a comprehensive statement of the actions Bristol Water will consider implementing during drought conditions to safeguard essential water supplies to customers and minimise environmental impact. It is consistent with Bristol Water's Water Resources Management Plan, the objective of which is to set the strategic plan for ensuring a supply-demand balance over a 25 year planning period. Strategic Environmental Assessment (SEA) was undertaken on Bristol Water's draft Drought Plan 2017 and was issued for public consultation alongside the draft plan in early 2017. The SEA has been updated in light of comments received, as set out in the Drought Plan Statement of Response.

SEA is a statutory requirement for certain plans or programmes which could have significant environmental implications; the SEA process helps to identify where there are potential impacts on the environment and how any adverse effects might be mitigated and any beneficial effects enhanced. Further information about SEA, and the rationale for applying it to Bristol Water's Drought Plan 2017, is provided in **Section 1.2**.

This Environmental Report (ER) presents the assessed environmental effects of Bristol Water's Drought Plan in a form suitable for use by stakeholders and decision-makers. In November 2016, a SEA Scoping Report was issued to the statutory consultees (Environment Agency, Natural England and Historic England) and published on Bristol Water's website which summarised the environmental and social baseline of the area likely to be affected by the Drought Plan. It also set out the assessment framework that would be used for the SEA, along with the proposed objectives against which effects of the plan would be assessed. Issues raised by consultees in response to the Scoping Report have been considered in preparing this Environmental Report (see **Section 1.7**).

This Environmental Report presents the environmental and social baseline information that sets the context for the effects assessment (Section 3) and provides details of the methods employed in undertaking the assessment (Section 4). The potential effects of the various Drought Plan management options are outlined in Section 5, with the assessment of cumulative, or in-combination, effects set out in Section 6. Information regarding mitigation and monitoring of the implementation of the Drought Plan is provided in Section 7.

## 1.2 Application of SEA to Drought Planning

### 1.2.1 Overview of Strategic Environmental Assessment

SEA became a statutory requirement following the adoption of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment. This was transposed into national legislation in England on 20 July 2004 as Statutory Instrument 2004 No.1633 – The Environmental Assessment of Plans and Programmes Regulations 2004.

The objectives of SEA are set out in Article 1 of the SEA Directive as follows:

*'to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans with a view to promoting sustainable development'*.

Amongst other requirements, the SEA Directive requires preparation of an Environmental Report in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and geographical scope of the plan or programme, are identified, described and evaluated. It should, however, be noted that as stated in the Office of the Deputy Prime Minister (ODPM) SEA Guidelines<sup>1</sup>. *“It is not the purpose of the SEA to decide the alternative to be chosen for the plan or programme. This is the role of the decision-makers who have to make choices on the plan or programme to be adopted. The SEA simply provides information on the relative environmental performance of alternatives, and can make the decision-making process more transparent”*. The SEA has therefore been used by Bristol Water to support the assessment of drought management options to be included in the Drought Plan, and their timing and implementation.

The range of issues to be included in an SEA is set out in the regulations, and includes the following topic areas: biodiversity, fauna and flora; population and human health; soil; water; air; climatic factors; material assets; cultural heritage and landscape.

SEA is usually focused mainly on environmental impacts. However, it is also good practice within the water industry to examine the broader social effects of drought management planning within the SEA. As such, the full range of environmental and social effects which are likely to arise from implementation of Bristol Water's Drought Plan have been considered.

### 1.2.2 Requirement for SEA and HRA of Bristol Water's Drought Plan

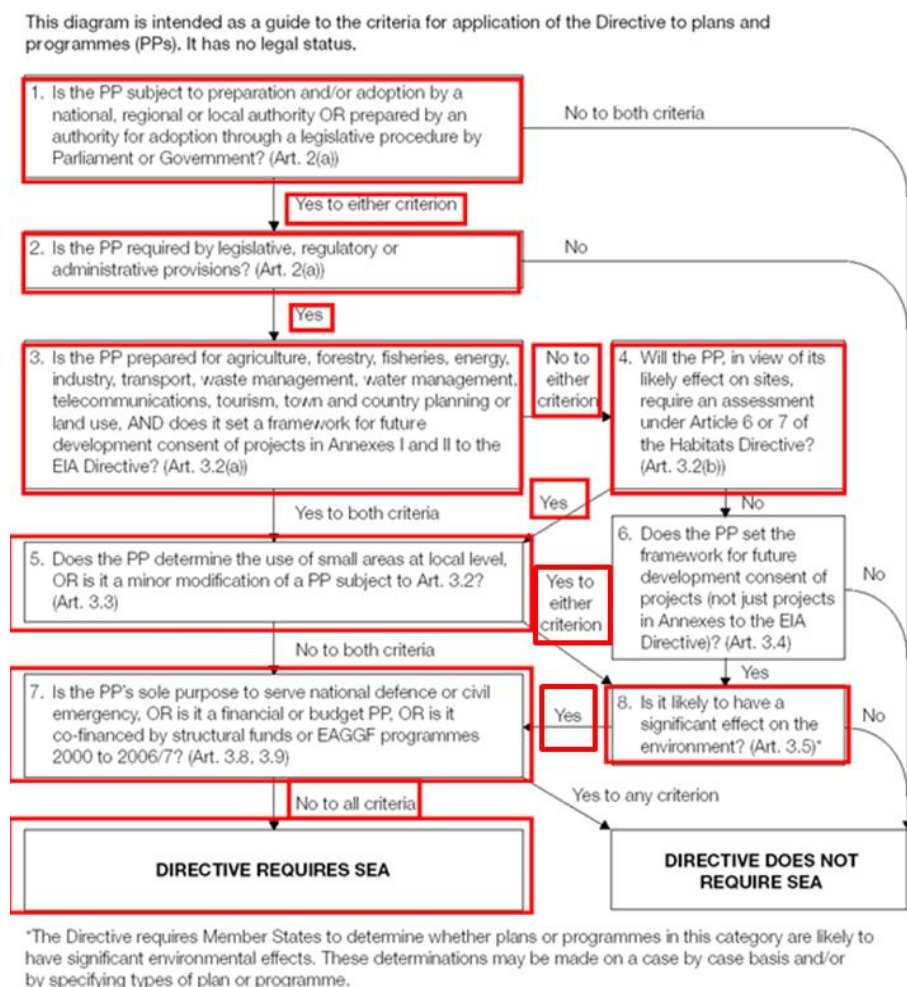
Screening was carried out to ascertain the requirement for SEA of the Bristol Water Drought Plan in accordance with the requirements of the SEA Regulations 2004 and following the screening guidance within the ODPM Practical Guide<sup>2</sup>. The flow diagram presented in Figure 2 of the ODPM Guidelines has been applied to Bristol Water's Drought Plan 2017 and is presented in **Figure 1.1**.

Adopting a precautionary approach as to the potential effects of the Drought Plan on designated European sites, Bristol Water has determined that an SEA should be carried out.

<sup>1</sup> Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive.

<sup>2</sup> Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive.

**Figure 1.1 SEA Requirement of Bristol Water's Drought Plan 2017**



The route through the flow diagram has been highlighted in red on **Figure 1.1**, and is described below:

1. Is the Plan subject to preparation and/or adoption by a national, regional or local authority OR prepared by an authority for adoption through a legislative procedure by Parliament or Government?
  - **Yes, prepared by an authority for adoption through a legislative procedure by Parliament or Government.**
2. Is the Plan required by legislative, regulatory or administrative provisions?
  - **Yes, required by legislative provisions.**
3. Is the Plan prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use, AND does it set a framework for future development consent of projects in Annexes I and II to the EIA Directive?
  - **The plan is prepared for water management. However, it does not set a framework for future development consent.**
4. Will the Plan, in view of its likely effect on sites, require an assessment under Article 6 or 7 of the Habitats Directive<sup>3</sup>?

<sup>3</sup> Superseded by the Conservation of Habitats and Species Regulations (2010), Section 61 to 67.

- **HRA screening is being undertaken and Appropriate Assessment of some of the measures contained in the plan might be required (precautionary approach adopted).**
- 5. Does the Plan determine the use of small areas at local level, OR is it a minor modification of a PP subject to Art. 3.2?
  - **No to all criteria.**
- 6. Is it likely to have a significant effect on the environment?
  - **Possibility that it may have significant effects.**
- 7. Is the PP's sole purpose to serve national defence or civil emergency, OR is it a financial or budget PP, OR is it co-financed by structural funds or EAGGF programmes?
  - **No to all criteria.**

**RESULT: DIRECTIVE REQUIRES SEA TO BE CARRIED OUT ON THE DROUGHT PLAN, ADOPTING A PRECAUTIONARY APPROACH**

### 1.2.3 Applying Strategic Environmental Assessment to Drought Planning

Drought Plans are tactical contingency plans that comprise a basket of potential management measures to help maintain essential water supplies to customers and which will only be implemented if and when required because of the unpredictable occurrence of a drought event. As a result, the actual impact of the Drought Plan over its 5-year planning period is subject to very significant uncertainties. There may or may not be a drought during the period of the plan, and each drought is different in terms of its severity, season, location and duration. Each combination of these factors may require a bespoke reaction in terms of measures to actually be implemented.

Due to the nature of the planning guidance, a Drought Plan must include all measures that the company may need to take progressively as the severity of a drought increases, including those that would only be needed in the worst possible drought. These will typically have some significant social and/or environmental effects, but are extremely unlikely to be required over the 5 year period of the plan. The Drought Plan therefore includes a range of possible alternative measures to allow Bristol Water to respond to a particular drought in the most appropriate way. It is impossible to predict in advance which and how many of the measures will be required to respond to each particular drought event.

As a result it is not possible to provide a certain prediction of the overall environmental effects of adopting the plan, as its implementation is uncertain. However, the outputs of the SEA do provide a comparative assessment of the environmental and social effects of implementing each potential drought management option which can be used by Bristol Water to assess the most appropriate measures to be implemented during an actual drought event.

While an environmental appraisal of each measure can be set out in the SEA, the lack of predictability of which measures will be implemented in any particular drought event means that it may be impossible to provide an accurate cumulative assessment of the impacts of the plan for a possible future drought event. The approach to cumulative assessment is set out in Section 4.2.2 and includes consideration of cumulative effects with neighbouring water company Drought Plans.

The methodology for carrying out and preparing this Environmental Report draws on the Government's SEA guidance<sup>4</sup> together with national guidance for undertaking SEA of Drought Plans, which has been produced on behalf of United Kingdom Water Industry Research (UKWIR)<sup>5</sup>. These documents are the recommended best practice guidance for preparation of SEAs for water company drought plans. In addition, a Drought Plan Guideline was published by the Environment Agency in 2011<sup>6</sup> and included recommendations for SEA of Drought Plans. A revised guideline was published by the Environment

<sup>4</sup> Office of the Deputy Prime Minister (2005). *A Practical Guide to the Strategic Environmental Assessment Directive*.

<sup>5</sup> UKWIR (2012) *Strategic Environmental Assessment and Habitats Regulation Assessment – Guidance for Water Resources Management Plans & Drought Plans (12/WR/02/A)*. Prepared by Cascade Consulting

<sup>6</sup> Environment Agency (2011) *Water Company Drought Plan Guideline*.

Agency in December 2015<sup>7</sup>. This revised guidance has informed the preparation of Bristol Water's Drought Plan 2017 and the SEA.

## 1.3 Bristol Water's Water Supply System, Water Resource Management and Drought Planning

### 1.3.1 Introduction

Bristol Water provides water supplies to 1.18 million people and all the associated businesses in an area of 2,400 square kilometres centred on Bristol and the towns and villages within a 20-mile radius of the city. The water supply area stretches from Thornbury and Tetbury in the north, to Street and Glastonbury in the south, and from Weston-Super-Mare in the west to Frome in the east. Bristol Water relies on 68 water sources, including reservoirs, rivers, springs, wells and boreholes.

Around half of the water supplied within the Bristol Water supply area is sourced from within it, with the rest being transferred into the zone from outside the area. This water is sourced from the Gloucester & Sharpness canal to supply the largest northern treatment works. This source accounts for approximately 46% of Bristol Water's licensed resource. The Gloucester & Sharpness canal is owned and operated by the Canal & River Trust and is supplied by the River Severn and other local rivers, the Cam and the Frome. In dry periods, use of this source is maximised to conserve the water stored in reservoirs. The Mendip Reservoirs and associated surface water abstractions account for approximately 42% of the available licensed resource. The remaining water sourced from within the water resource zone is derived from groundwater and accounts for approximately 12% of available licensed resource.

Bristol Water's supply area is bounded by three other water companies (Thames Water, Wessex Water and Severn Trent Water). A number of bulk water supplies are made between Bristol Water and several of these adjacent water companies. The water taken from the River Severn can be transferred across the network to reduce water demand in the southern half of the Bristol Water area (that would normally be supplied by reservoirs). By operating in this way, the company can manage the rate at which the levels of its reservoirs fall during dry periods, thereby conserving and prolonging reservoir storage. However, if these reservoirs were to empty completely, Bristol Water would be unable to supply all of its customers using only water supplied from the River Severn.

There is a significant degree of resilience and connectivity in both the raw water network and the treated water bulk transfer systems. This flexibility permits the sharing of resources, and allows optimum use according to seasonal availability. As a result, the Bristol Water supply area is operated as a single water resource zone in which all sources are used conjunctively.

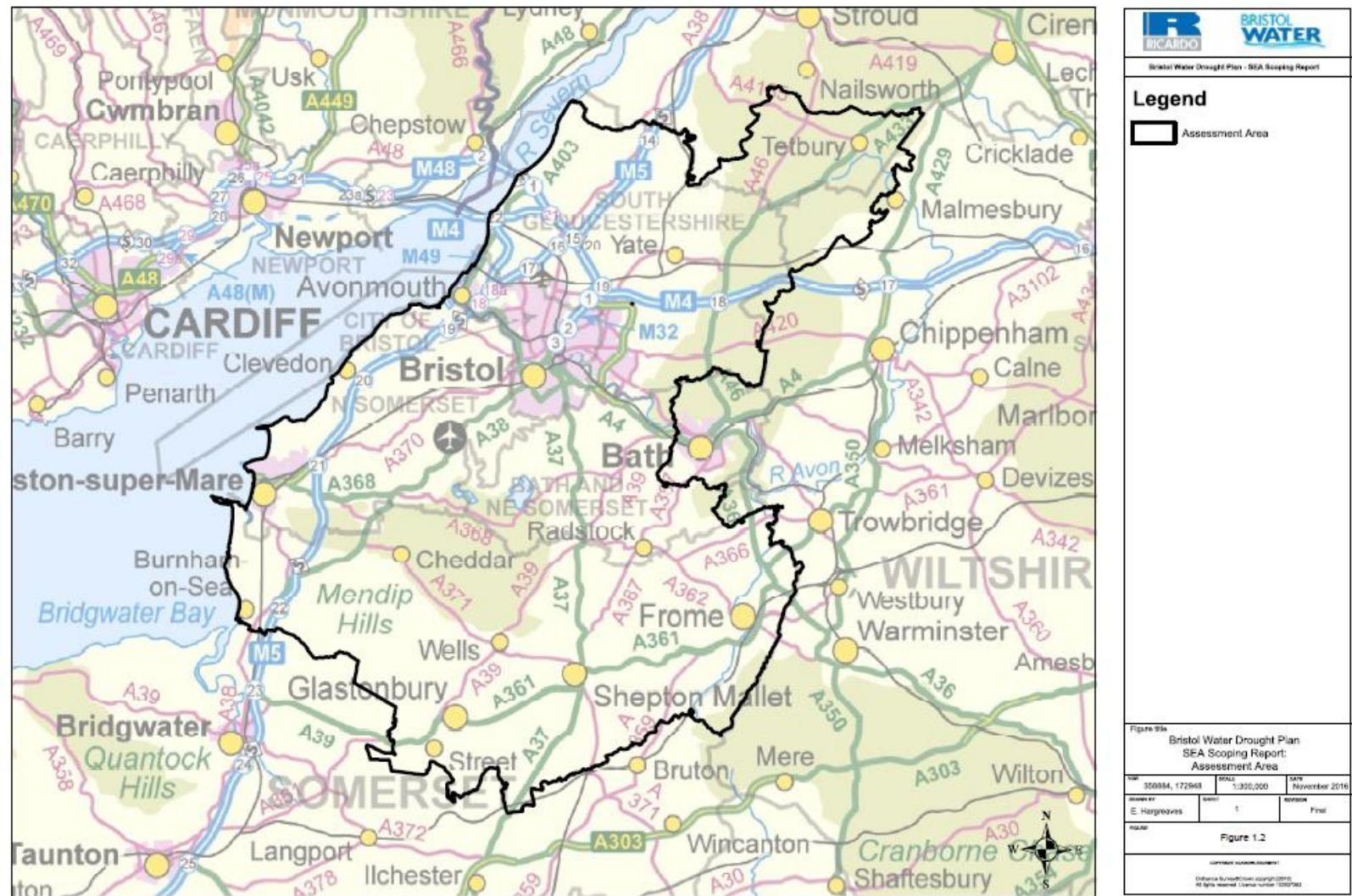
The geographical area under consideration for the SEA of the Drought Plan is shown in **Figure 1.2**. This area under consideration (i.e. spatial scope) is defined by the Bristol Water supply area. No transboundary effects have been identified. **Appendix A** provides further maps showing the location of key features of interest of relevance to the Drought Plan measures.

---

<sup>7</sup>Environment Agency (2016) *How to write and publish a drought plan*, December 2015. Available at <https://www.gov.uk/guidance/drought-plans-environmental-assessment-and-monitoring#carry-out-an-environmental-assessment>, Accessed 1 March 2016.



Figure 1.2: Bristol Water's Supply Area





## 1.4 Bristol Water's Drought Planning Process and Drought Management Options

### 1.4.1 Overview and Timetable of Drought Planning Process

Water companies in England and Wales are required to prepare and maintain Statutory Drought Plans under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003 and subsequently Water Act 2014, which set out the sort of operational steps a company will take before, during and after a drought. The Water Industry Act 1991 defines a Drought Plan as '*a plan for how the water undertaker will continue, during a period of drought, to discharge its duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders or drought permits*'.

Bristol Water published its last Drought Plan in October 2012. In accordance with the Drought Direction (England) 2016, Bristol Water was required to submit an updated draft Drought Plan to the Secretary of State in early 2017. The draft plan was issued for public consultation along with the SEA Environmental Report. Following feedback from the public consultation process, the plan (and associated SEA and HRA) has been updated as appropriate and re-submitted to the Secretary of State. The updated plan will guide Bristol Water's response to any drought events that may arise in the next five years.

Only those drought management measures which are relevant to the period encompassed by the Drought Plan are considered within this SEA. In this regard, environmental effects of the potential drought plan measures are considered within the context of the company's existing abstraction licence conditions and operating arrangements. Additionally, only those plans, projects and programmes that are likely to be effective over the next five years are considered in the SEA. The closely allied, but separate statutory process, of developing a long-term Water Resources Management Plan is also being undertaken by Bristol Water over the next two years. This will potentially identify new permanent measures to address water supply resilience, including during drought conditions.

### 1.4.2 Bristol Water's Drought Management Options

Bristol Water has identified drought plan triggers (Drought Management Zones) based on the combined storage in its major reservoirs (**Figure 1.3**). These triggers act as decision-points for implementation of drought management measures as reservoir storage is depleted in a drought event.

There are two broad categories of drought management actions: demand management measures and supply augmentation measures. These are described in the tables below.

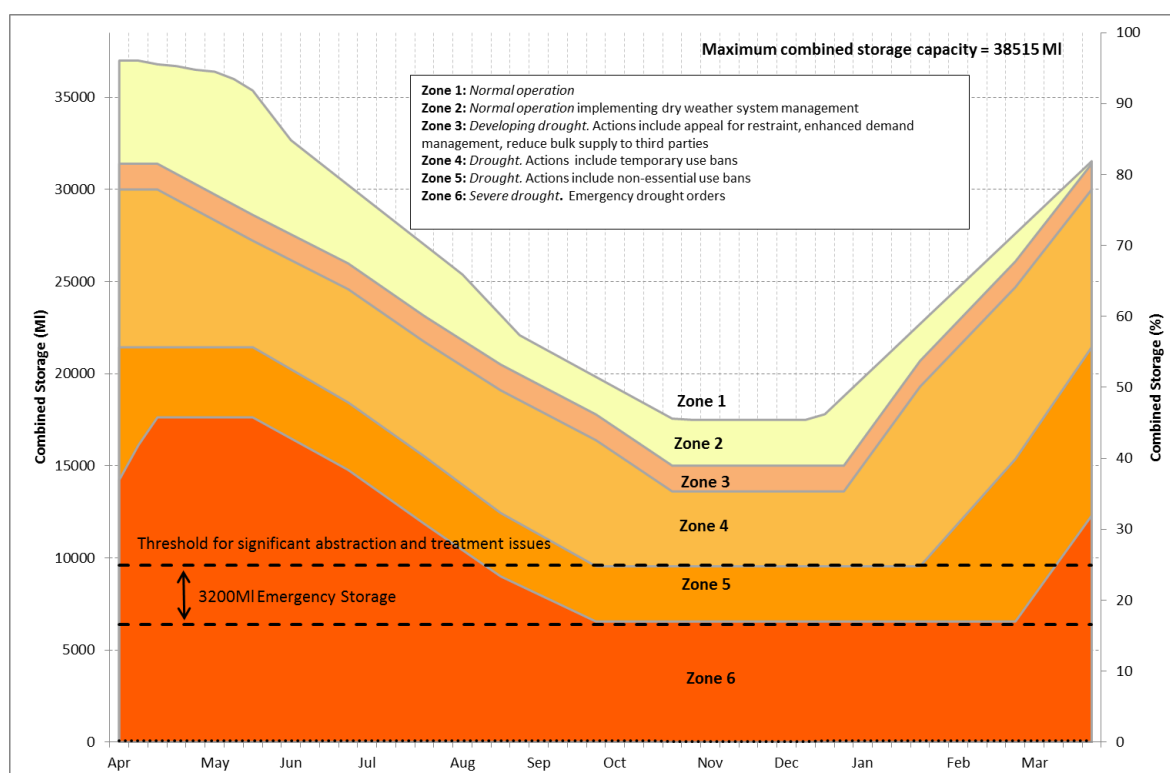
#### [Demand management options](#)

Demand side options are designed to reduce the demand for water and are generally non site specific (see **Table 1.1**). Demand management measures are part of a suite of options which would be put in place by Bristol Water as part of its Drought Plan alongside supply augmentation options.

**Table 1.1 Demand management measures**

Demand Management Measure	Description
Appeals for restraint	This measure would be enacted upon reservoir storage entering Drought Management Zone 3. The measure would help encourage customers to reduce their water usage via publicity campaigns and the media. The measure would be expected to reduce total household demand by 1%.
Temporary Use Ban (TUB)	<p>This measure to restrict certain non-essential water uses would be enacted upon reservoir storage entering Drought Management Zone 4. The measure would be expected to reduce peak summer household demand by up to 9.5%. The restrictions in water use include:</p> <ul style="list-style-type: none"> <li>• Cleaning a private leisure boat using a hosepipe</li> <li>• Cleaning a private motor vehicle using a hosepipe</li> <li>• Filling or maintaining an ornamental fountain</li> <li>• Cleaning walls, or windows, of domestic premises using a hosepipe</li> <li>• Cleaning paths or patios using a hosepipe</li> <li>• Cleaning other artificial outdoor surfaces using a hosepipe</li> <li>• Drawing water using a hosepipe, for domestic recreational use</li> <li>• Filling or maintaining a domestic swimming or paddling pool</li> <li>• Watering a garden using a hosepipe</li> <li>• Watering plants on domestic or non-commercial premises using a hosepipe</li> <li>• Filling or maintaining a domestic pond using a hosepipe</li> </ul>
Non Essential Use Ban (NEUB)	<p>This drought order to prohibit certain non-household water uses would be enacted upon reservoir storage entering Drought Management Zone 5. The measure would be expected to reduce of non-household demand by up to 2% across the year. The restrictions in water use include:</p> <ul style="list-style-type: none"> <li>• Watering outdoor plants on commercial premises</li> <li>• Filling or maintaining a non-domestic swimming or paddling pool</li> <li>• Filling or maintaining a pond</li> <li>• Operating cisterns (in unoccupied premises)</li> <li>• Cleaning industrial plant (except where required for health and hygiene)</li> <li>• Suppressing dust (except where controlled by health and safety regulations)</li> <li>• Operating a mechanical vehicle-washer</li> <li>• Cleaning a window of a non-domestic building</li> <li>• Cleaning any vehicle, boat, aircraft or railway rolling stock</li> <li>• Cleaning non-domestic premises</li> </ul>
Emergency Drought Order	This measure would be enacted upon reservoir storage entering Drought Management Zone 6. The reduction in water usage is unknown but may possibly reduce water usage by an additional 8% of peak summer household demand (on top of the savings from the Temporary Use Bans).

**Figure 1.3 Bristol Water: Drought Management Triggers**



### Supply augmentation options

Supply augmentation options considered by Bristol Water including bringing disused, licensed water sources back into supply and applying for drought permits to temporarily vary the conditions of abstraction licences for specific water sources.

### Honeyhurst and Rodney Stoke (Well Head)

Bristol Water's Honeyhurst and Rodney Stoke (Well Head), (referred to as Honeyhurst Well hereafter) is a licensed water source that has not been in operation for approximately 20 years. In the event of a drought, it would require recommissioning before it could be used to supply water. The recommissioning of the source would begin once reservoir storage reaches Drought Management Zone 4. The measure is expected to provide an additional 2.4 MI/d of water supplies.

Some construction activities are required in order to bring Honeyhurst Well into operation, including the replacement of the pumps at Honeyhurst Well to enable raw water to be pumped to the Cheddar water treatment works. The works would also require the construction of a 4.2km 300mm diameter pipeline. The pipeline route would traverse numerous drainage ditches and the Cheddar Yeo. The proposed route of the pipeline is 605m away from the closest SSSI, Cheddar Reservoir. The pipeline crosses many roads and the felling of some trees may be required.

### Drought Permits

Drought permits are drought management measures available to water companies which, if granted by the Environment Agency, can allow more flexibility to manage water resources and the effects of drought on public water supply and the environment. Potential drought permits considered by Bristol Water in developing the Drought Plan 2017 are identified in **Table 1.2**.

**Table 1.2 Drought Permit Options**

Drought Permit	Description
Reduction in compensation flow release from Blagdon Reservoir	This permit would be enacted upon reservoir storage reaching Drought Management Zone 5. The compensation flow release from Blagdon Reservoir would be reduced from 8.638 Ml/d to 4.038 Ml/d between 15 <sup>th</sup> May and 30 <sup>th</sup> November only. This will help to conserve water resources within Blagdon Reservoir.
Reduction in compensation flow release from Chew Reservoir	This permit would be enacted upon reservoir storage reaching Drought Management Zone 5. The compensation flow release from Chew Reservoir would be reduced from 14.32 Ml/d to 7 Ml/d between 1 <sup>st</sup> May and 31 <sup>st</sup> July, or from 6.819 Ml/d to 3.4 Ml/d (between 1 <sup>st</sup> December to 30 <sup>th</sup> April). This will help to conserve water resources within Chew Reservoir.
Reduction of prescribed flow at Cheddar Reservoir	This permit would be enacted upon reservoir storage reaching Drought Management Zone 5. The drought permit will reduce the prescribed flow into the Cheddar Yeo from 6.8 Ml/d to 3.4 Ml/d (between 1 <sup>st</sup> December to 14 <sup>th</sup> May) only. This will help to conserve water resources within Cheddar Reservoir.

#### Defining the list of alternative drought management options

In the context of drought planning, the individual options set out above are taken to constitute alternatives. The assessments provided in this document, along with the HRA screening assessment, have been used to help inform the decisions by Bristol Water as to the timing and phasing of the drought management options in the Drought Plan.

#### Supporting Information

A number of previous studies have been undertaken in relation to some of the drought management options which have informed the SEA as detailed in **Table 1.3**.

**Table 1.3: Previous studies used within the SEA process**

Report	Year
Bristol Water Drought Contingency Plan: Environmental Monitoring Plans Scoping Report (Cascade Consulting)	2006
Bristol Water Drought Contingency Plan Environmental Monitoring Plan (Cascade Consulting)	2007
Bristol Water Drought Contingency Plan- Baseline Environmental Monitoring	2011
Strategic Environmental Assessment of Draft Water Resources Management Plan- Environmental Report	2013

The Environmental Monitoring Plan<sup>8</sup> (EMP) was developed for the three drought permit options in 2007 at which time they formed part of the 2006 Bristol Water Drought Plan. Hydrological assessments were undertaken for the EMP in order to identify the hydrological zone of influence associated with each drought permit option. Maps identifying the zone of influence are presented in **Appendix B**.

<sup>8</sup> Bristol Water Plc (2007) Bristol Water Drought Contingency Plan Environmental Monitoring Plan. Report by Cascade Consulting, August 2007.

## 1.5 Stages of SEA Process

SEA screening has been undertaken which confirmed, on a precautionary basis, that Bristol Water's Drought Plan 2017 required SEA (see Section 1.2.2). **Table 1.4** is an extract from the Government's SEA guidance<sup>9</sup> that sets out the main stages of the SEA process and the purpose of each task within the process.

Stage A: *Setting the context and objectives, establishing the baseline and deciding on the scope* has already been completed by Bristol Water. A Scoping Report was issued to the statutory consultees (Environment Agency, Natural England and Historic England) and published on Bristol Water's website on 18th November 2016 (see Section 1.7 below) which provided an opportunity for these statutory bodies to provide views on the proposed scope and level of detail to be provided in the Environmental Report.

This Environmental Report represents work carried out in fulfilment of Stages B and C of the SEA process.

Specific guidance on the application of the SEA process to Drought Plans is provided in a best practice publication by UKWIR<sup>10</sup>.

**Table 1.4: SEA stages and tasks**

SEA Stages and Tasks	Purpose
<b>Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope</b>	
Task A1. Identifying other relevant plans, programmes and environmental protection objectives	To establish how the plan or programme is affected by other external factors so as to provide ideas for how any constraints can be addressed, and to help identify SEA objectives.
Task A2. Collecting baseline information	To provide an evidence base for relevant environmental and social issues and considering future changes to the baseline effects to help in the development of SEA objectives.
Task A3. Identifying environmental problems	To help focus the SEA and streamline the subsequent stages, including baseline information analysis, setting of the SEA objectives, prediction of effects and monitoring.
Task A4. Developing SEA Objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed.
Task A5. Consulting on the scope of the SEA	To ensure the SEA covers the likely significant environmental effects of the plan or programme and to seek views on the assessment methodology.
<b>Stage B: Developing and refining alternatives and assessing effects</b>	
Task B1. Testing the plan or programme objectives against SEA objectives	To identify potential synergies or inconsistencies between the objectives of the plan or programme and the SEA objectives and help in developing alternatives.
Task B2. Developing strategic alternatives	To develop and refine strategic alternatives.
Task B3. Predicting the effects of the plan or programme, including alternatives	To predict the significant environmental effects of the plan or programme and its alternatives.
Task B4. Evaluating the effects of the plan or programme, including alternatives	To evaluate the predicted effects of the plan or programme and its alternatives and assist in the refinement of the plan or programme.

<sup>9</sup> Office of the Deputy Prime Minister (2005). *A Practical Guide to the Strategic Environmental Assessment Directive*.

<sup>10</sup> UKWIR (2012) *Strategic Environmental Assessment and Habitats Regulation Assessment – Guidance for Water Resources Management Plans & Drought Plans (12/WR/02/A)*. Prepared by Cascade Consulting

SEA Stages and Tasks	Purpose
Task B5. Mitigating adverse effects	To ensure that adverse effects are identified and potential mitigation measures are considered.
Task B6. Proposing measures to monitor the environmental effects of plan or programme implementation	To detail the means by which the environmental performance of the plan or programme can be assessed.
<b>Stage C: Preparing the Environmental Report</b>	
Task C1. Preparing the environmental report	To present the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision-makers.
<b>Stage D: Consulting on the Draft Plan or programme and the Environmental Report</b>	
Task D1. Consulting the public and consultation bodies on the draft plan or programme and the Environmental Report	To give the public and the consultation bodies an opportunity to express their opinions on the findings of the Environmental Report and to use it as a reference point in commenting on the plan or programme. To gather more information through the opinions and concerns of the public
Task D2. Assessing significant changes	To ensure that the environmental implications of any significant changes to the draft plan or programme at this stage are assessed and taken into account.
Task D3. Making decisions and providing information	To provide information on how the Environmental Report and consultees opinions were taken into account in deciding the final form of the plan or programme to be adopted.
<b>Stage E: Monitoring the significant effects of the plan or programme on the environment</b>	
Task E1. Developing aims and methods for monitoring	To track the environmental effects of the plan or programme to show whether they are as predicted; to help identify adverse effects.
Task E2. Responding to adverse effects	To prepare for appropriate responses where adverse effects are identified.

## 1.6 Structure of the Environmental Report

This Environmental Report presents the findings of SEA Tasks B1 to B6 set out in **Table 1.4** and provides the public with relevant environmental information to understand the potential environmental and social effects of the Drought Plan 2017.

This Section (**Section 1**) describes the overall purpose and process of the SEA and background to Bristol Water's water supply system and drought planning process. The remainder of the report is structured as follows:

**Section 2-** Policy context: describes the key policies relating to the drought planning process.

**Section 3** – Baseline and context: presents the baseline information that sets the context for the assessment. Information on the current state of the environment within Bristol Water's supply area is provided along with a review of other policies, plans and programmes which will influence the Drought Plan.

**Section 4** – Methodology: provides details of the methods employed in undertaking the assessment including the cumulative effects assessment methodology.



---

**Section 5** – Assessment of the drought management options: presents the potential effects of the various drought management options against the SEA assessment framework.

**Section 6** – Cumulative Effects Assessment: discusses the potential in-combination impacts of the drought management options and other plans and projects in the area affected by the Drought Plan.

**Section 7** – Mitigation and Monitoring: discusses the measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the Drought Plan, and monitoring to track the environmental effects to show whether they are as predicted, identifying any adverse effects to trigger deployment of mitigation measures.

**Section 8** - ODPM Guidance Quality Assurance checklist: demonstrating that the requirements of the SEA Directive have been met.

## 1.7 Consultation Process

### 1.7.1 Overview

The SEA Regulations provide for consultation with the statutory bodies during the Scoping stage and with the public when the Environmental Report is issued alongside the draft Drought Plan for public consultation.

Once the Drought Plan has been approved by the Secretary of State and adopted by Bristol Water, the company will prepare an SEA Post-Adoption Statement setting out how the SEA and any views expressed by the consultation bodies or the public have influenced the Drought Plan.

### 1.7.2 Consultation on the Scoping Report

The consultation bodies were invited to express their views on the Scoping Report in accordance with SEA Regulation 12(5). A summary of the issues raised and responses to comments made are presented in **Appendix C**.

### 1.7.3 Consultation on the Environmental Report

The Environmental Report takes into consideration the responses received on the SEA Scoping consultation. The Environmental Report provides assessments of the adverse and beneficial effects of the various drought management measures and the overall Drought Plan. The Environmental Report was issued for public consultation alongside the consultation on the draft Drought Plan in early 2017.

Feedback from the consultation on the Environmental Report has been considered by Bristol Water and incorporated into a formal Statement of Response, setting out how the feedback has been used in the finalisation of the Drought Plan. It is expected that the Final Drought Plan will be published during autumn 2017.

The company will prepare an SEA Post-Adoption Statement once the Final Drought Plan has been approved by the Secretary of State. This Statement will set out how the SEA and any views expressed by the consultation bodies or the public have influenced the Final Drought Plan.

## 2 Policy context

### 2.1 Introduction

Annex 1 of the SEA Directive (Directive 2001/42/EC) requires the following specific baseline information to be included within an Environmental Report to identify the environmental characteristics of the area likely to be significantly affected by the Drought Plan:

- *“an outline of the...relationship with other plans and programmes”*
- *“the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme”*
- *“the environmental characteristics of areas likely to be significantly affected”*
- *“any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC (the ‘Birds Directive’) and 92/43/EEC (the ‘Habitats Directive’)”*
- *“the environmental protection objectives, established at international, (European) Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation”.*

In accordance with the SEA Directive, a review of relevant policies, plans and programmes is presented in Section 2.2. Baseline environmental information is presented in Section 3.

### 2.2 Review of Policies, Plans and Programmes

One of the first steps in undertaking SEA is to identify other relevant policies, plans, programmes and environmental protection objectives. The review of these other relevant plans sets out to establish how Bristol Water's Drought Plan might be affected by other plans, to identify other environmental protection objectives which the Drought Plan should consider and to help to identify the objectives for the SEA. The relevant plans and programmes were identified from the wide range that have been produced at an international, national, regional and local level. The following criteria were used to help ensure that the review focused on the plans and programmes most relevant to this SEA:

- Relevance to the Drought Plan: if the plan or programme did not have a significant effect on achieving the objectives of the Drought Plan or the Drought Plan does not have a significant effect on achieving the objectives of the other plan or programme, then it was not included.
- Relevance to Bristol Water supply area: plans for the South West of England region (specifically Bristol and other surrounding areas served by Bristol Water) were considered to be most relevant.

International, national, regional and local policies, plans, programmes and strategies reviewed are listed in **Table 2.1**, with the findings of the review provided in **Appendix D**. The key considerations for the drought plan are detailed in **Table 2.1** and the considerations specific to each plan, policy and programmes is detailed in **Appendix D**. The information from this review has been used to direct the presentation of baseline information on the current environmental and social characteristics of Bristol Water's water supply area (Section 3), and to develop proposed objectives for the SEA (Section 4).

**Table 2.1 Key policy messages**

SEA Topic	Key Messages	Key high level considerations for the Drought Plan	Plans, Policies and Programmes
Biodiversity, flora and fauna	<p>Conservation and enhancement of the natural environment and of biodiversity, particularly internationally and nationally designated sites, whilst taking into account future climate change.</p> <p>Promote a catchment-wide approach to water use to ensure better protection of biodiversity.</p> <p>To achieve favourable condition for priority habitats and species.</p> <p>Avoidance of activities likely to cause irreversible damage to natural heritage.</p> <p>Support well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological networks, including provision for fish passage and connectivity for migratory/mobile species.</p>	<p>The SEA must take into account:</p> <ul style="list-style-type: none"> <li>The impacts of the Drought Plan measures on internationally designated sites, species and important bird habitats (such as Ramsar and SPA designated sites) must be considered as part of the SEA. This should include migratory fish species and their migratory passage.</li> <li>The need to improve Natura 2000 sites and any effects of the Drought Plan on these designated sites.</li> <li>The need to protect protected species and consider this standing advice provided by Natural England.</li> <li>How the Drought Plan may influence biodiversity in the Bristol Water District and as such the SEA should take account of the need to maintain or enhance the quality of habitats and biodiversity.</li> <li>The impacts of the Drought Plan measures on internationally designated sites and species must be considered as part of the SEA.</li> <li>The effect on public access to the countryside. The SEA should include objectives that take into account public access, protection of SSSIs and the management of relevant landscape designations</li> <li>How the Drought Plan may increase the risk of spreading invasive non-native species and the SEA should take</li> </ul>	<p><i>International:</i></p> <p>United Nations (1992) Convention on Biological Diversity (CBD)</p> <p>European Commission, Birds Directive (2009/147/EC)</p> <p>European Commission The Water Framework Directive (2000/60/EC)</p> <p>European Commission, Directive on Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC)</p> <p>European Commission, Habitats Directive (1992/43/EEC)</p> <p>European Commission, The EU Biodiversity Strategy to 2020</p> <p>The Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983)</p> <p>The Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)</p> <p>The Convention on Wetlands of International Importance (Ramsar Convention) (1971)</p> <p><i>National:</i></p> <p>Conservation of Habitats and Species Regulations 2010 (as amended by the Conservation of Habitats and Species (Amendment) Regulations 2011 and 2012)</p> <p>The Countryside and Rights of Way (CROW) Act 2000</p> <p>Environmental Protection Act 1990</p> <p>Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 SI3104</p> <p>Wildlife and Countryside Act 1981 (as amended)</p> <p>DCLG (2012) National Policy Planning Framework</p> <p>Defra (2011) Water for Life - Water White Paper</p> <p>Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper</p> <p>Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services</p>

	<p>Strengthen the connections between people and nature and realise the value of biodiversity.</p> <p>Protection, conservation and enhancement of natural capital.</p> <p>Ecosystem services from natural capital contributes to the economy and therefore should be protected and, where possible, enhanced.</p> <p>Avoidance of activities likely to cause the spread of Invasive Non-Native Species (INNS)</p> <p>A need to protect the green infrastructure network.</p>	<p>account of the need to control and minimise this risk.</p> <ul style="list-style-type: none"> <li>• The strategy objectives, particularly regarding the protection and improvement of water, land and biodiversity.</li> <li>• The need to promote the protection of river and lake water quality in order to maintain and develop suitable environments that will sustain fresh water fish populations.</li> <li>• The need to protect and enhance salmon and sea trout fisheries.</li> <li>• The need to avoid environmental damage as a result of the implementation of drought plan measures.</li> <li>• The impacts of the Drought Plan measures on important wetland habitats must be considered as part of the SEA.</li> <li>• Consider the effects of the Drought Plan measures on ecosystem services.</li> </ul>	<p>Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network</p> <p>Defra 2011 UK National Ecosystem Assessment and Defra, 2014, UK National Ecosystems Assessment Follow on, Synthesis of Key Findings</p> <p>Defra (2015) The Great Britain Invasive Non-native Species Strategy</p> <p>Defra (2008), England Biodiversity Strategy –climate change adaptation principles</p> <p>Environment Agency (undated) Hydroecology: Integration for modern regulation</p> <p>Environment Agency (undated) WFD River Basin Characterisation Project Technical Assessment Method - River abstraction and flow regulation</p> <p>Environment Agency (2008) Sea trout and salmon fisheries. Our strategy for 2002 – 2021</p> <p>Environment Agency, Countryside Council for Wales, Natural England and RSPB (2004), Strategic Environmental Assessment and Biodiversity: Guidance for Practitioners</p> <p>The Environmental Damage (Prevention and Remediation) (England) Regulations 2015</p> <p>The Eels (England and Wales) Regulations 2009 (as amended)</p> <p>Natural Environment and Rural Communities Act 2006</p> <p>RSPB policy position statement on protected sites</p> <p>Salmon and Freshwater Fisheries Act 1975 (as amended)</p> <p>The Countryside and Rights of Way (CROW) Act 2000</p> <p>Wildlife and Countryside Act 1981 (as amended)</p> <p>Water Resources Act 1991 (as amended)</p> <p>Water Industry Act 1991 (as amended)</p> <p>Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 SI3104</p> <p>The Environment Act 1995</p> <p>The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (as amended)</p> <p><i>Regional/Local:</i></p> <p>Natural England Site Improvement Plans: South West (SIPs)</p>
--	--	--	---

			<p>Environment Agency and Defra, (2015) River Basin Management Plan Severn River Basin District</p> <p>Environment Agency and Defra, (2015) South West River Basin District River Basin Management Plan</p> <p>Environment Agency and Defra, (2015) River Basin Management Plan Thames River Basin District</p> <p>Environment Agency, Catchment Abstraction Management Strategy (various dates for relevant catchments)</p> <p>Defra (2010) Eel Management Plans for the United Kingdom. Severn River Basin District</p> <p>Bristol Avon Catchment Partnership (2012) Catchment Plan</p> <p>Bath and North East Somerset Council, Bristol City Council, North Somerset Council and South Gloucestershire Council (2016) The Joint Spatial Plan: Towards the Emerging Spatial Strategy</p> <p>South West Regional Biodiversity Partnership (2007) South West Biodiversity Implementation Plan</p> <p>Internal Drainage Boards (various) Water Level Management Plans</p> <p>Avon Wildlife Trust- 2015-2020 vision</p> <p>Somerset Wildlife Trust- 2015-2020 Strategic Plan</p>
Population and human health	<p>Water resources play an important role in supporting the health and recreational needs of local communities and businesses.</p> <p>To ensure all communities have a clean, safe and attractive environment in which people can take pride.</p> <p>To ensure secure, safe, reliable, dependable, sustainable and affordable supplies of water are provided for all communities.</p>	<p>The SEA must take into account:</p> <ul style="list-style-type: none"> <li>• The need to ensure that the Drought Plan avoids causing direct or indirect damage to the aquatic environment or contamination of land that creates a significant risk to human health.</li> <li>• The need to meet the Directive's objectives to maintain water quality to secure high standards of drinking water quality.</li> <li>• The need to maintain, protect and improve groundwater water quality across the assessment area.</li> <li>• The need to maintain, protect and improve bathing water quality across the assessment area.</li> </ul>	<p><i>International:</i></p> <p>United Nations Economic Commission for Europe (1998) Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters</p> <p>The Environment Noise Directive (Directive 2002/49/EC)</p> <p>HM Treasury Infrastructure UK (2014) National Infrastructure</p> <p>European Commission The Water Framework Directive (2000/60/EC)</p> <p>The Natural Environment and Rural Communities (NERC) Act (2006)</p> <p>European Commission, Drinking Water Directive (1998/83/EC) and subsequent amendments</p> <p>European Commission, The 7th Environmental Action Programme (EAP) Environment Action Programme to 2020 'Living well, within the limits of our planet' (1386/2013/EU)</p> <p>European Commission Blueprint to Safeguard Europe's Water Resources</p>

	<p>Access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and well-being of communities.</p> <p>Promotion of healthy communities and protection from risks to health and wellbeing.</p> <p>Promotion of a sustainable economy supported by universal access to essential utility and infrastructure services.</p>	<ul style="list-style-type: none"> <li>• The need to promote the achievement of the sustainable development objectives outlined in this plan.</li> <li>• The SEA should provide easily understood information to the public on the environmental implications of the Drought Plan and its constituent measures.</li> <li>• The Drought Plan and SEA should take account of the key components of sustainable development and consider the three dimensions to sustainable development: economic, social and environmental.</li> <li>• The Drought Plan and SEA should take into account future trends in household growth as well as other major developments that impact the health and well-being of the local population.</li> <li>• The Drought Plan and SEA should take into account future urban developments that impact on the local population and local environment.</li> <li>• The implementation of the Drought Plan options could have an effect on recreation and leisure where it impacts on lakes and other water bodies used for leisure.</li> <li>• The SEA should include objectives relating to leisure and recreation.</li> </ul>	<p><i>National:</i></p> <p>The Countryside and Rights of Way (CROW) Act, 2000 Environmental Protection Act 1990 DCLG (2012) National Planning Policy Framework Defra (2005) Securing the Future; Delivering UK Sustainable Development Strategy Defra (2011) Water for Life -Water White Paper Defra (2011) The Natural Choice: securing the value of nature. The Natural Environment White Paper Defra (2011) Drought Direction 2011 Defra (2016) Drought Direction 2016 Environment Agency (2014) Corporate Plan 2014 – 2016 Environment Agency (2015) Creating a Better Place: Environment Agency Corporate Strategy 2014-2016 HM Treasury (2015) Fixing the Foundations: Creating a More Prosperous Nation HM Treasury Infrastructure UK (2014) National Infrastructure Plan The Natural Environment and Rural Communities (NERC) Act (2006)</p> <p><i>Regional/Local:</i></p> <p>Bristol Development Framework: Core Strategy 2011 Bristol Health and Wellbeing Policy 2013 Bristol Avon Catchment Partnership (2012) Catchment Plan Bath and North East Somerset Council, Bristol City Council, North Somerset Council and South Gloucestershire Council (2016) The Joint Spatial Plan: Towards the Emerging Spatial Strategy Culture South West (2007) People, Places and Spaces Consultation Draft</p>
--	---	--	--



<p>Material assets and resource use</p>	<p>Promote sustainable production and consumption whilst seeking to reduce the amount of waste generated by using materials, energy and water more efficiently.</p> <p>Consider issues of water demand, water supply and water quality in the natural environment and ensure a sustainable use of water resources.</p> <p>Contribute to a resource efficient, green and competitive low carbon economy. Maintain a reliable public water supply and ensure there is enough water for human uses, whilst seeking to maintain a healthy water environment.</p> <p>Minimise the production of waste, ensure waste management is in line with the 'waste hierarchy', and eliminate waste sent to landfill.</p> <p>Promote the sustainable management of natural resources.</p>	<p>The SEA must take into account:</p> <ul style="list-style-type: none"> <li>• The need to promote the achievement of the sustainable development objectives outlined in this plan.</li> <li>• The implementation of the Drought Plan may have an influence upon Bristol Water's total energy use. The SEA should take account of the need to promote energy efficiency and seek measures to reduce the effects of climate change due to greenhouse gas emissions. The SEA should also take account of the need to promote the use of renewable energy, where relevant.</li> <li>• The implementation of the Drought Plan may have an influence upon Bristol Water's total energy use. The SEA should take account of the need to promote energy efficiency and promote the use of renewable energy, where relevant.</li> <li>• The Drought Plan may involve measures that involve the generation of waste (e.g. either through construction requirements or operation of supply side options). The SEA should take account of the need to enhance recycling and minimise the amount of waste going to landfill.</li> <li>• The need to ensure the promotion of sustainable development, sustainable resource use and measures to protect the natural environment.</li> <li>• The implementation of certain Drought Plan measures may have an effect upon rural communities and the countryside. The SEA should take account of the need to ensure that the quality of the landscapes, natural resources and biodiversity in the assessment area are maintained or enhanced.</li> </ul>	<p><i>International:</i></p> <p>United Nations (2002) Commitments arising from the World Summit on Sustainable Development, Johannesburg</p> <p><i>National:</i></p> <p>DCLG (2012) National Planning Policy Framework</p> <p>Defra (2011) Government Review of Waste Policy in England 2011</p> <p>HM Treasury Infrastructure UK (2014) National Infrastructure Plan</p> <p>Defra (2008) Future Water: the Government's water strategy for England</p> <p>Environment Agency (2009) Water Resources Strategy for England and Wales</p> <p>Environment Agency (2010) Water Resources Action Plan for England and Wales</p> <p>Environmental Protection Act 1990</p> <p>Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report</p> <p>Defra (2008) Future Water: the Government's water strategy for England</p> <p>HM Treasury (2015) Fixing the Foundations: creating a more prosperous nation.</p>
---	--	--	---

		<ul style="list-style-type: none"><li>• The implementation of the Drought Plan may have some indirect links with the food industry, through ensuring the availability of water for food based activities. The SEA should take account of the need to promote the most effective use of natural resources, including soil, biodiversity and energy resources.</li><li>• Outputs from the SEA process will help assess how drought plan measures may affect natural capital assets in the Bristol Water supply area.</li><li>• The need to raise productivity via long term investment and a dynamic economy.</li><li>• The Drought Plan can contribute to the providing resilient water services and the SEA should consider the effects of drought plan measures on other national infrastructure and associated services.</li></ul>	
--	--	--	--

Water	<p>Promote sustainable water resource management, including a reduction in water consumption.</p> <p>Maintain and improve water quality (surface waters, groundwater and bathing waters).</p> <p>Expand the scope of water quality protection measures to all waters, surface waters and groundwater.</p> <p>Improve the quality of the water environment and the ecology which it supports, and continue to provide high levels of drinking water quality.</p> <p>Ensure appropriate management of abstractions and protect flow and level variability across the full range of regimes from low to high conditions.</p> <p>Prevent deterioration of waterbody status.</p> <p>Balance the abstraction of water for supply with the other functions and services the water environment performs or provides.</p>	<p>The SEA must take into account:</p> <ul style="list-style-type: none"> <li>• The approach to environmental assessment and what needs to be carried out by water companies to mitigate or reduce adverse effects of Drought Plan measures, and provide compensation for any effects that remain following mitigation.</li> <li>• The need to promote the protection and enhancement of all water resources.</li> <li>• The strategy objectives, particularly regarding the protection and improvement of water, land and biodiversity.</li> <li>• The range of impacts that changes to abstractions could have on the environment, including water bodies, biodiversity, and water users.</li> <li>• The Drought Plan and SEA should ensure relevant ecological considerations are taken into account in assessing drought plan measures.</li> <li>• The need to avoid environmental damage as a result of the implementation of drought plan measures.</li> <li>• The need to ensure that flood risk is not adversely affected by the implementation of the Drought Plan.</li> <li>• The need to ensure that the Drought Plan avoids causing direct or indirect damage to the aquatic environment or contamination of land that creates a significant risk to human health.</li> <li>• The need to meet the Directive's objectives to maintain water quality to secure high standards of drinking water quality.</li> </ul>	<p><i>International:</i></p> <p>European Commission Floods Directive (2007/60/EC)</p> <p>European Commission the Water Framework Directive (2000/60/EC)</p> <p>European Commission Drinking Water Directive (1998/83/EC) (amended 2015)</p> <p>European Commission Environmental Liability Directive (2004/35/EC)</p> <p>Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration</p> <p>European Commission Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC</p> <p>European Commission Urban Waste Water Treatment Directive (91/271/EEC)</p> <p>European Commission Nitrates Directive (91/676/EEC)</p> <p><i>National:</i></p> <p>Defra (2005) Making Space for Water</p> <p>Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report</p> <p>Defra (2012) National Policy Statement for Waste Water</p> <p>Defra (2011) Water for Life - Water White Paper</p> <p>Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper</p> <p>Defra (2011) Drought Direction 2011</p> <p>Defra (2016) Drought Direction 2016</p> <p>Defra (2008) Future Water: The Government's water strategy for England</p> <p>Defra and Welsh Government (2014) River Basin Planning Guidance</p> <p>Defra and Environment Agency (2015) How to Write and Publish a Drought Plan</p> <p>Environment Agency (2016) Drought plan guidance extra information: Environmental Assessment for water company drought plans</p> <p>Defra (2002) Directing the Flow – Priorities for Future Water Policy</p>
-------	--	--	---

	<p>Steer new development to areas with the lowest probability of flooding and manage any residual flood risk, taking account of the impacts of climate change.</p> <p>Promote measures to enable and sustain long term improvement in water efficiency.</p>	<ul style="list-style-type: none"> <li>• The need to maintain, protect and improve groundwater water quality across the assessment area.</li> <li>• The need to maintain, protect and improve bathing water quality across the assessment area.</li> <li>• The need to promote the achievement of the sustainable development objectives outlined in this plan.</li> <li>• The Drought Plan and SEA should take into account national wastewater policies.</li> <li>• The Drought Plan supports the provisioning service of freshwater through ensuring security of supply during times of drought. The SEA should consider the effects of the Drought Plan</li> <li>• The need to promote the protection and enhancement of all water resources without having negative effects on other aspects of the environment.</li> <li>• The Drought Plan may have an effect on some of the RBMP objectives. The SEA should include objectives that take into account the relevant objectives of the RBMP, particularly ensuring no deterioration of WFD status.</li> <li>• The SEA will include objectives that ensure that the effect of the Drought Plan on other abstractors, water resource availability and the water environment is assessed.</li> <li>• The Drought Plan should not conflict with the other water company operations that may be operated simultaneously with Bristol Water's drought plan measures. The SEA will consider cumulative effects of the Drought Plan with these Water Resources Management Plans of other neighbouring water companies.</li> </ul>	<p>Environment Agency (2010) Water Resources Action Plan for England and Wales</p> <p>Environment Agency (2009) Water Resources Strategy for England and Wales</p> <p>Environment Agency (2013) Managing Water Abstraction</p> <p>Environment Agency (2013) Climate change approaches in water resources planning – overview of new methods</p> <p>Environment Agency (2014) Corporate Plan 2014 – 2016</p> <p>Environment Agency (2015) Creating a Better Place: Environment Agency Corporate Strategy 2014-2016</p> <p>Environment Agency CAMS (various)</p> <p>Environment Agency and other lead authorities Shoreline Management Plans</p> <p>UKCIP (2009) UK Climate Projections UKCP09</p> <p>Flood and Water Management Act (2010)</p> <p>The Water Act (2003)</p> <p>The Water Environment (WFD) (England and Wales) Regulations 2003</p> <p>Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 SI3104</p> <p>The Water Resources Management Plan Regulations 2007</p> <p>Water Resources Act 1991 (as amended)</p> <p>Water Industry Act 1991 (as amended)</p> <p>UKTAG on the WFD Guidance Documents (various dates)</p> <p>Water Use (Temporary Bans) Order 2010</p> <p>Defra (2016) Single Departmental Plan 2015 - 2020</p> <p><i>Regional/Local:</i></p> <p>Environment Agency (2015) Drought response: our framework for England</p> <p>Drought Plans from adjacent water companies:</p> <p>Wessex Water (2013) Drought Plan</p> <p>Thames Water (2013) Drought Plan</p> <p>Severn Trent Water (2013) Drought Plan</p>
--	---	---	--

		<ul style="list-style-type: none"> <li>The implementation of the Drought Plan options could have an effect on recreation and leisure where it impacts on lakes and other water bodies used for leisure.</li> </ul>	<p>Environment Agency, Catchment Abstraction Management Strategy (various dates for relevant catchments)</p> <p>Neighbouring water company Water Resource Management Plans (2015-2040).</p> <p>Environment Agency and Defra, (2015) South West River Basin District River Basin Management Plan</p> <p>Environment Agency and Defra, (2015) River Basin Management Plan Severn River Basin District</p> <p>Environment Agency and Defra, (2015) River Basin Management Plan Thames River Basin District</p> <p>Environment Agency (2016) South West River Basin District, Flood risk management plan 2015-2021</p> <p>Bristol Avon Catchment Partnership (2012) Catchment Plan</p> <p>Bath and North East Somerset Council, Bristol City Council, North Somerset Council and South Gloucestershire Council (2016) The Joint Spatial Plan: Towards the Emerging Spatial Strategy</p> <p>Internal Drainage Boards (various) Water Level Management Plans</p>
--	--	--	--

<p>Soil, geology and land use</p>	<p>Protect and enhance the quality and diversity of geology (including geological SSSIs) and soils, including geomorphology and geomorphological processes.</p> <p>Ensure that soils will be protected and managed to optimise the varied functions they perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, supporting biodiversity), in keeping with sustainable development principles.</p> <p>Promote catchment-wide approach to land management by relevant stakeholders, in order to benefit natural resources, reduce pollution and develop resilience to climate change.</p> <p>Promote mixed-use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions.</p> <p>Encourage the effective use of land by reusing land that has been previously</p>	<p>The SEA must take into account:</p> <ul style="list-style-type: none"> <li>• The approach to environmental assessment and what needs to be carried out by water companies to mitigate or reduce adverse effects of Drought Plan measures, and provide compensation for any effects that remain following mitigation</li> <li>• The SEA assessment framework should take account of the need to protect soils.</li> <li>• The strategy objectives, particularly regarding the protection and improvement of water, land and biodiversity.</li> <li>• The need to protect or enhance the quality of the land, including soils.</li> <li>• The need to ensure that the Drought Plan avoids causing direct or indirect damage to the aquatic environment or contamination of land that creates a significant risk to human health.</li> <li>• The need to promote the achievement of the sustainable development objectives outlined in this plan.</li> <li>• The Drought Plan and SEA should take account of the key components of sustainable development and consider the three dimensions to sustainable development: economic, social and environmental.</li> <li>• The implementation of the Drought Plan may have some indirect links with the food industry, through ensuring the availability of water for food based activities. The SEA should take account of the need to promote the most effective use of natural resources, including soil, biodiversity and energy resources.</li> <li>• Outputs from the SEA process will help assess how drought plan measures may</li> </ul>	<p><i>International:</i></p> <p>Council of Europe (2003) European Soils Charter European Commission (2006) Thematic Strategy for Soil Protection</p> <p><i>National:</i></p> <p>Defra (2009) Safeguarding our Soils – A Strategy for England Defra (2004) The First Soil Action Plan for England DCLG (2012) National Policy Planning Framework Defra (2004) Rural Strategy 2004 Defra (2006) Sustainable Farming and Food Strategy: Forward Look The Countryside and Rights of Way (CROW) Act (2000) Wildlife and Countryside Act 1981 (as amended). Defra (2012) National Planning Policy Framework</p> <p><i>Regional/local:</i></p> <p>National Character Area (NCA) profiles Environment Agency and Defra, (2015) River Basin Management Plan South West River Basin District Environment Agency and Defra, (2015) River Basin Management Plan Severn River Basin District Environment Agency and Defra, (2015) River Basin Management Plan Thames River Basin District</p>
-----------------------------------	---	--	--



	developed (brownfield land), provided that it is not of high environmental value.	affect natural capital assets in the Bristol Water supply area.	
--	---	---	--

<p>Air and climate</p>	<p>Reduce greenhouse gas emissions. Targets include reducing the UK's greenhouse gas emissions by at least 80% (relative to 1990 levels) by 2050.</p> <p>Reduce the effects of air pollution on ecosystems.</p> <p>Improve overall air quality.</p> <p>Minimise energy consumption, support the use of sustainable/renewable energy and improve resilience to climate change.</p> <p>Build in adaption to climate change to future planning and consider the level of urgency of associated risks of climate change impacts accordingly.</p> <p>Need for adaptive measures to respond to likely climate change impacts on water supply and demand.</p>	<p>The SEA must take into account:</p> <ul style="list-style-type: none"> <li>• The approach to environmental assessment and what needs to be carried out by water companies to mitigate or reduce adverse effects of Drought Plan measures, and provide compensation for any effects that remain following mitigation.</li> <li>• The implementation of the Drought Plan may have some influence on air quality, either directly or indirectly through construction or operation activities. The SEA should take account of the need to ensure that air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum.</li> <li>• The need for water companies to seek to promote a reduction in greenhouse gas emissions in carrying out its service activities.</li> <li>• The need to seek to promote the use of renewable energy.</li> <li>• The need to reduce air pollution.</li> <li>• The implementation of the Drought Plan may have some influence on air quality, either directly or indirectly through construction or operation activities. The SEA should take account of the need to ensure that air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum.</li> <li>• The need to promote the achievement of the sustainable development.</li> <li>• The Drought Plan and SEA should take account of the key components of sustainable development and consider the three dimensions to sustainable development: economic, social and environmental.</li> </ul>	<p><i>International:</i></p> <p>The Paris Agreement (2016), Cancun Agreement (2011) and Kyoto Agreement (1997)</p> <p>European Commission (2008) Ambient Air Quality Directive (2008/50/EC)</p> <p>European Commission (2009) Promotion of the use of energy from renewable sources Directive (2009/28/EC)</p> <p>European Commission (2005) Thematic Strategy on Air Pollution</p> <p><i>National:</i></p> <p>DCLG (2012) National Policy Planning Framework</p> <p>Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report</p> <p>Defra (2008), England Biodiversity Strategy – climate change adaptation principles</p> <p>DECC (2007) Energy White Paper: Meeting the Energy Challenge</p> <p>Environment Agency (2014) Corporate Plan 2014 – 2016</p> <p>Environment Agency (2015) Creating a Better Place: Environment Agency Corporate Strategy 2014-2016</p> <p>The Climate Change Act 2008</p> <p>The Energy Act 2013</p> <p>UKCIP (2009) UK Climate Projections UKCP09</p> <p>Defra (2013) The National Adaptation Programme: Making the country resilient to a changing climate.</p> <p>Defra (2007) The Air Quality Strategy for England, Scotland and Wales</p> <p>Department of Energy and Climate Change (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity</p> <p><i>Regional/Local:</i></p> <p>Bristol City Council (2014) Air Quality Progress Report</p> <p>Bristol City Council (2015) Our Resilient Future: A Framework For Climate And Energy Security</p>
------------------------	--	--	--

		<ul style="list-style-type: none"><li>• The implementation of the Drought Plan may have an influence upon Bristol Water's total energy use. The SEA should take account of the need to promote energy efficiency and seek measures to reduce the effects of climate change due to greenhouse gas emissions. The SEA should also take account of the need to promote the use of renewable energy, where relevant.</li><li>• The SEA should take into account the need for climate change adaptation</li></ul>	
--	--	--	--

<p>Archaeology and cultural heritage</p>	<p>Built development in the vicinity of historic buildings and Scheduled Monuments could have implications for the setting and/or built fabric and cause damage to any archaeological deposits present on the site.</p> <p>Ensure active management of the environmental and cultural assets in the assessment area.</p> <p>Ensure effects resulting from changes to water level (surface or sub-surface) on all historical and cultural assets are avoided.</p> <p>Consider effects on important wetland areas with potential for paleo-environmental deposits.</p> <p>Promote the conservation and enhancement of the historic environment, including the promotion of heritage and landscape as central to the culture of the assessment area and conserve and enhance distinctive characteristics of landscape and settlements.</p> <p>Conserve and enhance the historic environment, heritage assets and their settings.</p>	<p>The SEA must take into account:</p> <ul style="list-style-type: none"> <li>• The approach to environmental assessment and what needs to be carried out by water companies to mitigate or reduce adverse effects of Drought Plan measures, and provide compensation for any effects that remain following mitigation.</li> <li>• The need to protect and enhance heritage and landscape.</li> <li>• The SEA should take into account the effects of drought plan measures on the settings of heritage assets.</li> <li>• The Drought Plan and SEA should take account of the need to protect scheduled monuments and archaeological areas.</li> <li>• The Drought Plan and SEA should take account of the key components of sustainable development and consider the three dimensions to sustainable development: economic, social and environmental.</li> <li>• The implementation of the Drought Plan may have an influence on the heritage of the assessment area. The SEA should take account of the need to ensure any adverse effects on heritage assets are minimised or avoided.</li> <li>• The SEA should take account of the need to consider the implications of climate change and its potential impacts on heritage and the historic environment.</li> <li>• The SEA should consider the potential effects of the Drought Plan on the historic environment, particularly designated assets and their settings, and to important wetland areas with potential for paleo-environmental deposits. Historic characterisation can supplement information about designations.</li> </ul>	<p><i>International:</i></p> <p>The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention)</p> <p>The European Convention on the Protection of Archaeological Heritage (Valletta Convention)</p> <p>The World Heritage Convention (UNESCO) 1972 (a global instrument for the protection of cultural and natural heritage)</p> <p><i>National:</i></p> <p>Ancient Monuments and Archaeological Areas Act 1979</p> <p>DCLG (2012) National Policy Planning Framework</p> <p>English Heritage (2008), Climate Change and the Historic Environment</p> <p>English Heritage (2010), Heritage at Risk (register is updated annually and is managed by Historic England).</p> <p>Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment</p> <p>Historic England (2015) The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning</p> <p>Department for Culture, Media and Sport (2001) The Historic Environment – A Force for the Future (2001)</p> <p>Planning (Listed Buildings and Conservation Areas) Act 1990</p> <p><i>Local</i></p> <p>Our Inherited City: Bristol Heritage Framework: 2015-2018</p> <p>City of Bath World Heritage Site Management Plan (2016-2022)</p>
--	---	---	---

		<p>Sustainability issues, objectives and indicators identified in this document should be taken into account in the SEA.</p> <ul style="list-style-type: none"> <li>The Drought Plan and SEA should take account of the need to protect listed buildings and conservation areas.</li> </ul>	
Landscape and visual amenity	<p>Protection and enhancement of landscape (including designated landscapes, landscape character, distinctiveness and the countryside).</p> <p>Abstraction and low river flows could negatively affect landscape and visual amenity.</p> <p>Enhance the value of the countryside by protecting the natural environment for this and future generations.</p> <p>Improve access to valued areas of landscape character in sustainable ways to enhance its enjoyment and value by visitors and stakeholders.</p>	<p>The SEA must take into account:</p> <ul style="list-style-type: none"> <li>The approach to environmental assessment and what needs to be carried out by water companies to mitigate or reduce adverse effects of Drought Plan measures, and provide compensation for any effects that remain following mitigation</li> <li>The SEA should take account of the need to protect and enhance heritage and landscape.</li> <li>The implementation of the Drought Plan may influence landscape or the enjoyment of landscapes in the Bristol Water SEA area and as such the SEA should consider the need to maintain or enhance the quality of landscapes and the potential enjoyment of these landscapes.</li> <li>The Drought Plan and SEA should take account of the key components of sustainable development and consider the three dimensions to sustainable development: economic, social and environmental.</li> <li>The SEA should consider the effects of the Drought Plan measures on ecosystem services, including aesthetic services.</li> <li>The implementation of certain Drought Plan measures may have an effect upon rural communities and the countryside. The SEA should take account of the</li> </ul>	<p><i>International:</i></p> <p>Council of Europe (2006) European Landscape Convention</p> <p><i>National:</i></p> <p>DCLG (2012) National Policy Planning Framework</p> <p>Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper</p> <p>Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network</p> <p>The Countryside and Rights of Way (CROW) Act (2000)</p> <p>Wildlife and Countryside Act 1981 (as amended)</p> <p><i>Regional/Local:</i></p> <p>AONB Management Units AONB Management Plans</p> <p>Cotswolds AONB Management Plan 2014-2018</p> <p>Mendip Hills AONB Communication Action Plan 2014-2018</p> <p>Natural England National Character Area (NCA) Profiles</p>

		<p>need to ensure that the quality of the landscapes, natural resources and biodiversity are maintained or enhanced.</p> <ul style="list-style-type: none"><li>• The SEA should take account of NCA profiles and include a SEA objective relating to the protection of landscape character.</li><li>• The implementation of the Drought Plan options could have an effect on recreation and leisure where it impacts on lakes and other water bodies used for leisure.</li><li>• The SEA should include objectives relating to leisure and recreation.</li></ul>	
--	--	--	--



## 3 Environmental Baseline Review

### 3.1 Introduction

An essential part of the SEA process is to identify the current baseline conditions and their likely evolution. It is only with knowledge of existing conditions that impacts of the Drought Plan can be identified, mitigated and subsequently monitored.

The SEA Directive (Directive 2001/42/EC) requires that the evolution of baseline conditions of the plan area (that would take place with or without implementation of the plan) is identified. This is useful when determining impact significance, particularly with regards to baseline conditions that may already be improving or worsening and the rate of such change. The baseline assessment has drawn on data for the South West of England, and specifically those areas that lie within the Bristol Water supply area.

Full environmental baseline data presented in **Appendix E** have been drawn from a variety of sources, including a number of the plans and programmes reviewed as part of the SEA process given in **Table 2.1**. This environmental baseline review also summarises the likely future trends for the environmental issues being considered (where information is available). The key issues arising from the review of baseline conditions are summarised in Section 3.2.

The baseline review covers the spatial area under consideration for the SEA (see **Figure 1-2**), although information for some topic areas is only available at a larger spatial scale (for example, collected for South West England).

#### 3.1.1 Limitations of the data and assumptions made

Information used in the baseline relates to the South West of England. As such, this baseline information may not identify the more localised issues that may be against the general trends of the regions. For example, this may include pockets of deprivation in relatively affluent areas or any localised differences in environmental quality.

Data have generally been sourced from national or regional bodies, where information is collected for regions of the UK. Whilst this allows for a more effective comparison between regional and national averages, reliance on these data sets has in some cases meant that information is a number of years old.

### 3.2 Key Issues

The following section provides an overview of the key issues established from the baseline. Further detail can be found in the **Appendix E**.

#### 3.2.1 Biodiversity, fauna and flora

The key sustainability issues arising from the baseline assessment for biodiversity are:

- The need to protect or enhance the assessment area's biodiversity, particularly within designated sites, protected species and habitats of principal importance.
- The need to avoid activities likely to cause irreversible damage to natural heritage.
- The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors.
- The need to control the spread of Invasive Non-Native Species (INNS)
- The need to recognise the importance of allowing wildlife to adapt to climate change.

- The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.

### 3.2.2 Population and Human Health

The key sustainability issues arising from the baseline assessment for population and human health:

- The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water for health and wellbeing.
- The need to ensure continued improvements in levels of health across the assessment area, particularly in urban areas and deprived areas.
- The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures.
- The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other uses such as agriculture.
- The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists for access to green infrastructure and the natural and historic environment, as well as protecting and enhancing recreational resources.
- The need to accommodate an increasing population and local housing growth through provision of essential services including water supply.
- Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and wellbeing and the economy.

### 3.2.3 Material Assets and Resource Use

The key sustainability issues arising from the baseline assessment for material assets and resource use:

- The need to minimise the consumption of resources, including water and energy.
- The need to reduce the total amount of waste produced in the assessment area, from all sources, and to reduce the proportion of this waste sent to landfill.
- The need to continue to reduce leakage from the water supply system to help reduce demand for water.
- The need to continue to encourage more efficient water use by consumers.

### 3.2.4 Water

The key sustainability issues arising from the baseline assessment for water:

- The need to further improve the quality of river, estuarine and coastal waters in the assessment area taking into account WFD and designated sites objectives (i.e. assessment against Common Standards Monitoring Guidance, where relevant).
- The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives. Where deterioration has occurred between the 2009 and 2015 classification, then restoration is required to bring the waterbody back up to the 2009 standard.
- The need to improve the resilience, flexibility and sustainability of water resources in the assessment area, particularly in light of potential climate change impacts on surface waters and groundwaters.
- The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply.
- The need to ensure that people understand the value of water.

Flooding is not viewed as a key issue for the SEA water topic in relation to the Drought Plan because none of the drought management measures are likely to involve the construction of permanent physical infrastructure within areas at risk of flooding or contribute to an increase in flood risk.

### 3.2.5 Soil, Geology and Land Use

The key sustainability issues arising from the baseline assessment for soil, geology and land use:

- The need to protect and enhance geological features of importance (including geological SSSIs) and maintain and enhance soil function and health.
- The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).
- The Drought Plan is unlikely to affect land-use as no permanent development will be required to meet the objectives of the plan.

### 3.2.6 Air and Climate

The key sustainability issues arising from the baseline assessment for air and climate:

- The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.
- The need to reduce greenhouse gas emissions (industrial processes and transport).
- The need to adapt to the impacts of climate change, for example through sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities afforded by climate change.

### 3.2.7 Archaeology and Cultural Heritage

The key sustainability issues arising from the baseline assessment for archaeology and cultural heritage:

- The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their setting, particularly those which are sensitive to the water environment.
- The need to protect water-dependent heritage sites during drought conditions.

### 3.2.8 Landscape and Visual Amenity

The key sustainability issues arising from the baseline assessment for landscape and visual amenity:

- The need to protect and improve the natural beauty of the area's AONBs and other areas of natural beauty.
- The need to protect and improve the character of landscapes and townscapes.

## 4 Methodology

### 4.1 Overview

This section outlines the assessments that will be carried out as part of the SEA to identify the environmental and social effects of the potential measures to be considered for the Bristol Water Drought Plan.

#### **What the SEA Regulations require:**

According to Regulation 12:

- (2) The report shall identify, describe and evaluate the likely significant effects on the environment of –*
- (a) implementing the plan or programme; and*
- (b) reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme*

and according to Schedule 2, the Environmental Report should include:

- 6. The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects and secondary, cumulative and synergistic effects.*
- 8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.*

The environmental and social assessment of the drought management options are 'objectives-led'. Establishing assessment objectives is a recognised way of considering the environmental effects of a plan and comparing the effects of alternatives. SEA objectives have been derived from environmental and social objectives established in law, policy or other plans and programmes, as well as from the review of baseline information and environmental issues (based on the SEA topics in Section 3).

An assessment framework of SEA objectives has been developed based on:

- The key policy messages and environmental and social protection objectives identified in the review of policies, and other plans and programmes (see Section 2). It is important that the assessment takes these objectives into account as this will help to highlight any area where the Drought Plan will help or hinder the achievement of the objectives of other plans (e.g. at local, national and international level – see review of Plans, Policies and Programmes in Section 2).
- The current state of the environment in the assessment area and the key environmental issues identified (see Section 3).

SEA objectives are set out in **Table 4.1** alongside the key messages identified from the review of policies, plans and programmes and the key issues from the review of baseline information. The following sections describe how Bristol Water has used these SEA objectives in the assessment of the environmental and social effects of the drought options. By assessing each measure against the objectives, it is more apparent where measures might have an adverse or beneficial effect, and where measures could be developed to reduce potential impacts or enhance beneficial effects.

As well as the overall SEA objectives, a number of key questions have been developed for each SEA topic. These key questions have been used to prompt the assessment and ensure it considered all of the relevant aspects. The assessment of each option has included consideration of the following information:

- Details of each drought option;
- Likelihood and predicted frequency of deployment of the measure;
- Construction (where applicable) and operational/implementation details;
- Benefits to the water supply-demand position in a drought (taking uncertainty into account); and
- Key elements of the baseline environment, such as location of designated sites, priority habitats and species, landscape areas or heritage assets, etc.

**Table 4.1 SEA objectives and assessment approach**

SEA topic	Policies, plans and programmes - key messages	Baseline - key issues	SEA objective	Key questions
Biodiversity, fauna and flora	<p>Conservation and enhancement of the natural environment and of biodiversity, particularly internationally and nationally designated sites and priority habitats and species, whilst taking into account future climate change.</p> <p>Promote a catchment-wide approach to water use to ensure better protection of biodiversity.</p> <p>To achieve favourable condition for priority habitats and species.</p> <p>Avoidance of activities likely to cause irreversible damage to natural heritage.</p> <p>Support well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological networks, including provision for fish passage and connectivity for migratory/mobile species.</p> <p>Strengthen the connections between people and nature and realise the value of biodiversity.</p> <p>Protection, conservation and enhancement of natural capital. Ecosystem services from natural capital contributes to the economy and therefore should be protected and, where possible, enhanced.</p>	<p>The need to protect or enhance biodiversity, particularly within designated sites, protected species and habitats of principal importance.</p> <p>The need to avoid activities likely to cause irreversible damage to natural heritage.</p> <p>The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors.</p> <p>The need to control the spread of Invasive Non-Native Species (INNS).</p> <p>The need to recognise the importance of allowing wildlife to adapt to climate change.</p> <p>The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.</p>	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species and to enhance natural capital.	<ul style="list-style-type: none"> <li>Will it contribute to favourable condition or favourable conservation status of the most important sites for nature conservation (SAC, SPA, Ramsar, SSSI)?</li> <li>Will it have Likely Significant Effects on Natura 2000 sites (with reference to HRA undertaken in parallel)? Or will it cause significant harm to a SSSI or priority habitat?</li> <li>Will it protect and enhance aquatic, transitional and terrestrial priority species and habitats?</li> <li>Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity?</li> <li>Will it contribute to the sustainable management of natural habitats and ecosystems, i.e. within their limits and capacities?</li> <li>Will it promote wildlife's ability to adapt to climate change?</li> <li>Will it affect WFD and designated site compliance e.g. good ecological potential/status?</li> <li>Will it protect or enhance natural capital and ecosystem services?</li> </ul>



SEA topic	Policies, plans and programmes - key messages	Baseline - key issues	SEA objective	Key questions
	A need to protect the green infrastructure network.			<ul style="list-style-type: none"> <li>Will it create areas of improved biodiversity in urban or deprived areas or easily accessible to those areas?</li> </ul>
	Avoidance of activities likely to cause the spread of Invasive Non-Native Species (INNS)		1.2 To avoid introducing or spreading INNS.	<ul style="list-style-type: none"> <li>Will it limit, reduce or increase the risk of spread of Non-Native Species (INNS)?</li> </ul>
Population and human health	<p>Water resources play an important role in supporting the health and recreational needs of local communities and businesses.</p> <p>To ensure all communities have a clean, safe and attractive environment in which people can take pride.</p> <p>To ensure secure, safe, reliable, dependable, sustainable and affordable supplies of water are provided for all communities.</p>	<p>The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water for health and wellbeing.</p> <p>The need to ensure continued improvements in health across the assessment area, particularly in urban areas and deprived areas.</p>	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).	<p>Will it help to ensure provision of access to a secure resilient and affordable supply of drinking water?</p> <p>Will it help to protect or improve drinking water quality?</p> <p>Will it raise awareness of the importance and value of the water environment for health and well-being?</p> <p>Will it assist in ensuring provision of essential services to support health and well-being?</p>

SEA topic	Policies, plans and programmes - key messages	Baseline - key issues	SEA objective	Key questions
	<p>Access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and well-being of communities.</p> <p>Promotion of healthy communities and protection from risks to health and wellbeing.</p> <p>Promotion of a sustainable economy supported by universal access to essential utility and infrastructure services.</p>	<p>The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures.</p> <p>The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other use such as agriculture.</p> <p>The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment.</p> <p>The need to accommodate an increasing population.</p> <p>Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and wellbeing and the economy.</p>	<p>2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).</p> <p>2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water.</p>	<p>Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation?</p> <p>Will it help to promote healthy communities and protect from risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)?</p> <p>Does it protect and enhance the green infrastructure network?</p> <p>Will it assist in ensuring provision of essential services to good access to essential services?</p>

SEA topic	Policies, plans and programmes - key messages	Baseline - key issues	SEA objective	Key questions
Material assets and resource use	Promote sustainable production and consumption whilst seeking to reduce the amount of waste generated by using materials, energy and water more efficiently.	The need to minimise the consumption of resources, including water and energy.	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	Will it help to minimise the demand for resources? Will it minimise the use of energy and promote energy efficiency? Will it make use of existing infrastructure? Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?
	Consider issues of water demand, water supply and water quality in the natural environment and ensure a sustainable use of water resources.  Contribute to a resource efficient, green and competitive low carbon economy.  Maintain a reliable public water supply and ensure there is enough water for human uses, whilst seeking to maintain a healthy water environment.  Minimise the production of waste, ensure waste management is in line with the 'waste hierarchy', and eliminate waste sent to landfill.  Promote the sustainable management of natural resources.	The need to reduce the total amount of waste produced in the assessment area, from all sources, and to reduce the proportion of this waste sent to landfill.  The need to continue to reduce leakage from the water supply system to help reduce demand for water.  The need to encourage efficient water use.		Will it enable efficient water use and ensure maintenance of water supplies? Will it help to minimise the demand for water?
Water	Promote sustainable water resource management, including a reduction in water consumption.  Maintain and improve water quality (surface waters, groundwater and bathing water).	The need to further improve the quality of rivers, estuarine and coastal waters taking into account WFD objectives.  The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives.	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Will it lead to a change in river flows, wetted width or river level? Will it alter the flow regime or residence time of surface waters? Will it lead to changes in groundwater levels and recharge? Will it contribute towards improving the awareness of water sustainability and its true value?

SEA topic	Policies, plans and programmes - key messages	Baseline - key issues	SEA objective	Key questions
	Expand the scope of water quality protection measures to all waters, surface waters and groundwater.	The need to improve the resilience, flexibility and sustainability of water resources in the assessment area, particularly in light of potential climate change impacts on surface waters and groundwaters.		Will it promote measures to enable improvements in water efficiency and assist in reducing water abstraction?  Will it lead to a temporary or permanent deterioration to WFD water body status?
	Improve the quality of the water environment and the ecology which it supports, and continue to provide high levels of drinking water quality.			
	Ensure appropriate management of abstractions and protect flow and level variability across the full range of regimes from low to high conditions.		4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Will it present a risk to water quality of groundwater, surface water or estuarine waters?  Will it achieve WFD compliance? e.g. good ecological potential/status, prevent deterioration of WFD status between status classes?  Will it prevent water pollution? Will it affect WFD or designated protected areas?
	Prevent deterioration of waterbody status.	The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply.		
	Balance the abstraction of water for supply with the other functions and services the water environment performs or provides.	The need to ensure that people understand the value of water.		
	Steer new development to areas with the lowest probability of flooding and manage any residual flood risk, taking account of the impacts of climate change.		4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources	Will it achieve an appropriate balance of supply with other functions and services (including agriculture and navigation)?  Will it ensure sustainable abstractions, taking account of water resources availability status?
	Promote measures to enable water efficiency.			
Soil, geology and land use	Protect and enhance the quality and diversity of geology (including geological SSSIs) and soils, including geomorphology and geomorphological processes which can be lost or damaged by insensitive development.	The need to protect and enhance geological features of importance (including geological SSSIs) and maintain and enhance soil function and health.	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Will it avoid damage to and protect geologically important sites (e.g. geological SSSIs)?  Will it protect and enhance geomorphology and geomorphological processes?
	Ensure that soils will be protected and managed to optimise the varied functions that soils perform			

SEA topic	Policies, plans and programmes - key messages	Baseline - key issues	SEA objective	Key questions
	<p>for society (e.g. supporting agriculture and forestry, protecting cultural heritage, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development.</p> <p>Promote catchment-wide approach to land management by relevant stakeholders, in order to benefit natural resources, reduce pollution and develop resilience to climate change.</p> <p>Promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions.</p> <p>Encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value.</p>	The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).		Will it protect and enhance the quality of soils?
Air and Climate	Reduce greenhouse gas emissions. Targets include: reduce the UK's greenhouse gas emissions by at least 80% (relative to 1990 levels) by 2050.	The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.	6.1 To reduce air pollutant emissions.	Will it reduce or minimise air pollutant emissions? Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?
	Reduce the effects of air pollution on ecosystems.	The need to reduce greenhouse gas emissions (industrial processes and transport).		
	Improve overall air quality.		6.2 To reduce greenhouse gas emissions.	Will it reduce or minimise greenhouse gas emissions? Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions?
	Minimise energy consumption, support the use of sustainable/renewable energy and improve resilience to climate change.	The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities afforded by climate change.	6.3 To adapt and improve resilience to the threats of climate change.	Will it reduce vulnerability or increase resilience to risks
Air and Climate	Build in adaption to climate change to future planning and consider the level of urgency of associated risks of climate change impacts accordingly.			

SEA topic	Policies, plans and programmes - key messages	Baseline - key issues	SEA objective	Key questions
	Need for adaptive measures to respond to likely climate change impacts on water supply and demand.			<p>associated with climate change effects (e.g. drought)?</p> <p>Will it create opportunities to benefit from potential effects of climate change?</p> <p>Will it make use of renewable energy?</p>
Archaeology and cultural heritage	<p>Built development in the vicinity of historic buildings and Scheduled Monuments could have implications for the setting and/or built fabric and cause damage to any archaeological deposits present on the site.</p> <p>Ensure active management of environmental and cultural assets.</p> <p>Ensure effects resulting from changes to water level (surface or sub-surface) on all historical and cultural assets are avoided. Consider effects on important wetland areas with potential for paleo-environmental deposits.</p> <p>Promote the conservation and enhancement of the historic environment, including the promotion of heritage and landscape as central to the culture of the assessment area and conserve and enhance distinctive characteristics of landscape and settlements.</p> <p>Conserve and enhance the historic environment, heritage assets and their settings.</p>	The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their settings, particularly those which are sensitive to the water environment.	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	<p>Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness?</p> <p>Will it maintain and enhance the historic environment, including palaeo-environmental deposits?</p> <p>Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits?</p> <p>Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the assessment area?</p>



SEA topic	Policies, plans and programmes - key messages	Baseline - key issues	SEA objective	Key questions
Landscape and visual amenity	<p>Protection and enhancement of landscape (including designated landscapes, landscape character, distinctiveness and the countryside).</p> <p>Abstraction and low river flows could negatively affect landscape and visual amenity.</p> <p>Enhance the value of the countryside by protecting the natural environment for this and future generations.</p> <p>Improve access to valued areas of landscape character in sustainable ways to enhance its enjoyment and value by visitors and stakeholders.</p>	<p>The need to protect and improve the natural beauty of the AONBs and other areas of natural beauty in the assessment area.</p> <p>The need to protect and improve the character of landscapes and townscapes in the assessment area.</p>	<p>8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.</p>	<p>Will it avoid adverse effects and enhance designated landscapes?</p> <p>Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g. woodlands) and avoid the loss of landscape features and local distinctiveness?</p>

## 4.2 Assessment Framework

### 4.2.1 Primary Assessment

The appraisal framework set out in **Table 4.2** has been used to assess each of the potential drought management options against the SEA objectives (as set out in **Table 4.1**). The assessment findings have been used, alongside the findings of the HRA screening report, to inform the selection and phasing of measures for inclusion in Bristol Water's Drought Plan. The appraisal framework table is given in **Table 4.2**.

The first and second columns of **Table 4.2** set out the SEA topics and objectives. The third column provides commentary and evaluation of the impact of each alternative measure on the objectives for each topic, with reference to the key questions set out above in **Table 4.1**. The assessment assumes the implementation of standard best practice in implementing the measures and any defined mitigation measures (set out in the commentary) so that the significance of effects relates to the residual effects after mitigation in line with the ODPM Practical Guide and UKWIR SEA national guidance. Any mitigation measures for any identified residual adverse effects are also described.

The scale of the effect, which might relate to either geographical scale or the size of the population affected, is identified in the fourth column on a scale of small, medium to large. The significance of effect includes consideration of the nature of the impact, likelihood, duration and permanence (fifth, sixth and seventh columns of **Table 4.2**) in compliance with criteria for determining the likely significance of effects specified in the SEA Directive Article 3(5) and Annex II, and the SEA Regulations Part 2, Regulation 9(2a) and Schedule 1. With respect to duration, short-term impacts are defined as those that last for up to six months, medium term impacts are those that extend for six months to two years whilst long term impacts are assessed as those that continue for greater than two years.

The eighth column identifies the magnitude of the effect on a scale of low, medium and high. The value and sensitivity of the receptor(s) are identified in the ninth column on a scale of low, medium and high. The residual adverse and beneficial effects (after application of best practice approaches and any appropriate and explicit mitigation measures) are set out in the tenth and eleventh columns, respectively. These effects are identified separately so as to avoid mixing adverse and beneficial effects, in line with SEA best practice.

Where qualitative and/or quantitative information was available for any Drought Plan option (e.g. from the HRA or 2007 EMP), this has been used to inform the assessment. Objectives or key questions that are not supported by available data or information have been evaluated using spatial analysis, professional judgement and appropriate assessment guidelines relating to that topic/objective.

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

**Table 4.2 SEA appraisal framework used to assess each Drought Plan option**

Topic	SEA objective	Potential residual effect on sensitive receptors (assuming good practice construction methods)	Scale of effect: (Small/Medium/Large)	Certainty of effect (Low/Medium/High)	Duration (short/medium/long term)	Permanence of effect (permanent/temporary)	Magnitude of effect (Low/Medium/High)	Value/sensitivity of receptor (Low/Medium/High)	Residual Adverse Effect	Residual Beneficial Effect
Biodiversity, fauna and flora	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species and to enhance natural capital.									
	1.2 To avoid introducing or spreading INNS.									
Population and human health	2.1 To protect and enhance health and well-being (including raising awareness of the importance and value of the water environment for health and well-being).									
	2.2 To protect and enhance the water environment for other users including recreation, tourism and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).									
	2.3 To promote a sustainable economy with good access to essential services, including a resilient, high quality and affordable supply of water.									

Topic	SEA objective	Potential residual effect on sensitive receptors (assuming good practice construction methods)	Scale of effect: (Small/Medium/Large)	Certainty of effect (Low/Medium/High)	Duration (short/medium/long term)	Permanence of effect (permanent/temporary)	Magnitude of effect (Low/Medium/High)	Value/sensitivity of receptor (Low/Medium/High)	Residual Adverse Effect	Residual Beneficial Effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.									
	3.2 To promote and secure the efficient and sustainable use of water to ensure resilient water supplies for people and businesses.									
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.									
	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.									
	4.3 To ensure appropriate and sustainable management of abstractions to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources									

Topic	SEA objective	Potential residual effect on sensitive receptors (assuming good practice construction methods)	Scale of effect: (Small/Medium/Large)	Certainty of effect (Low/Medium/High)	Duration (short/medium/long term)	Permanence of effect (permanent/temporary)	Magnitude of effect (Low/Medium/High)	Value/sensitivity of receptor (Low/Medium/High)	Residual Adverse Effect	Residual Beneficial Effect
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.									
Air and Climate	6.1 To reduce air pollutant emissions.									
	6.2 To reduce greenhouse gas emissions.									
	6.3 To adapt and improve resilience to the threats of climate change.									
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.									

Topic	SEA objective	Potential residual effect on sensitive receptors (assuming good practice construction methods)	Scale of effect: (Small/Medium/Large)	Certainty of effect (Low/Medium/High)	Duration (short/medium/long term)	Permanence of effect (permanent/temporary)	Magnitude of effect (Low/Medium/High)	Value/sensitivity of receptor (Low/Medium/High)	Residual Adverse Effect	Residual Beneficial Effect
Landscape and visual amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.									




The SEA appraisal framework has been used to capture the assessment for each drought option. The results of the option assessments are summarised in Section 5 and detailed in **Appendix F**.

For each SEA objective, a residual effects assessment was determined against a significance matrix (**Figure 4.1**) which takes account of the value and sensitivity of the receptor (e.g. species, air quality, river water quality, landscape value, heritage feature) and the magnitude of the assessed effect. This significance matrix comprises effects from 'major beneficial' to 'major adverse'. Hatching has been added to the box signifying low magnitude and high receptor value/sensitivity as this could result in a greater than 'moderate' effects being assigned dependent on the sensitivity and value of the receptor. This colour coding has been used to complete the columns for residual effects in the appraisal framework.

The resulting significance of effects has been used to help inform the selection of options for inclusion in the Drought Plan and subsequently to help determine the phasing of the selected options. Where major adverse effects are predicted, broad measures envisaged to prevent, reduce and as fully as possible offset these effects on the environment (as a result of implementing the measure) are outlined where relevant.

**Figure 4.1** Significance matrix used to assess effects of each Drought Plan measure on each SEA objective

Significance of Effect		Value/sensitivity of receptor		
		High	Medium	Low
Effect magnitude (includes scale of effect)	High	Major Beneficial Major Adverse	Major Beneficial Major Adverse	Moderate Beneficial Moderate Adverse
	Medium	Major Beneficial Major Adverse	Moderate Beneficial Moderate Adverse	Minor Beneficial Minor Adverse
	Low	 Major Beneficial Major Adverse	Minor Beneficial Minor Adverse	Negligible



= Significance of effect dependent on value/sensitivity of receptor and magnitude

### General Significance Definitions

**Major** - effects represent key factors in the decision-making process. They are generally associated with sites and features of international, national or regional importance. If adverse, such resources/features are generally those which cannot be replaced or relocated.

**Moderate** - effects are likely to be important considerations at a regional or district scale. If adverse, they are likely to be of potential concern.

**Minor** - effects are not likely to be decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.

**Negligible** - effects which are not perceptible, being within normal bounds of variation or the margin of forecasting error.

For the '**high**' effect magnitude (top row), a major effect significance is assigned for both high and medium value receptors to reflect the magnitude of the effect.

For the '**low**' effect magnitude and '**high**' value receptor (bottom left box), the significance of effect could be minor, moderate or major dependent on the precise nature of the impact or benefit.

All drought plan options– both supply augmentation and demand management measures – have been assessed in line with the SEA legislative requirements, national SEA guidance and the UKWIR SEA guidance. The level of detail to be developed for the environmental assessment of each measure is consistent with the strategic nature of SEA. Further detailed assessment would be required to support any future actual applications for any drought permits, drought orders or emergency drought order options.

### Summarising the effects assessment

The completed appraisal framework table for each potential Drought Plan measure is presented in full in **Appendix F**. A summary of the assessment is presented in Section 5 using a colour-coded visual evaluation (VE) matrix (example provided in **Table 4.3**). For each option (as identified in Section 1) and each SEA topic listed in the left hand column, the VE matrix summarises the likely significance of impacts (which are detailed in the completed appraisal framework tables in **Appendix F**).

**Table 4.3 Example Visual Evaluation Matrix**

Drought Plan measure	SEA objective – adverse effects									SEA objective – beneficial effects								
	Objective 1.1	Objective 1.2	Objective 1.3	Objective 2.1	Objective 2.2	Objective 2.3	Objective 3.1	Objective 3.2	Objective 4.1	Objective 1.1	Objective 1.2	Objective 1.3	Objective 2.1	Objective 2.2	Objective 2.3	Objective 3.1	Objective 3.2	Objective 4.1
[Measure 1]	Blue	Red	Blue	Yellow	Yellow	Orange	Red	Red	Red	Blue	Green	Blue	Blue	Green	Green	Green	Green	Green
[Measure 2]	Orange	Blue	Yellow	Red	Yellow	Yellow	Orange	Orange	Red	Green	Blue	Green	Blue	Blue	Green	Blue	Green	Green

## 4.3 Secondary, Cumulative and Synergistic Environmental Effects

Schedule 2(6) of the SEA Regulations requires the assessment of “*The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects....*” From here on in “*cumulative effects*” is taken to include secondary and synergistic effects.

Because the combination of options that would be deployed in any one drought event cannot be pre-determined (see Section 1.2), a dedicated cumulative effects assessment has been carried out in order to assess whether any options are mutually exclusive, or whether combinations of options would reinforce beneficial effects or lead to greater adverse effects. The cumulative effects assessment has therefore involved examining the likely significant effects of each of the drought management options in combination with each other as well as in combination with the implementation of other plans, projects or programmes. A matrix has been used to help consider interactions between options. In assessing these effects, consideration has been given to other factors which may affect the receiving environment in the short, medium and long term.

The following cumulative assessments have been undertaken (see Section 6 for more details):

- An assessment of cumulative effects of options that could potentially be implemented at the same time. Mutually exclusive measures (e.g. those that draw upon the same resource or use the same site) have also been identified.
- Assessment of cumulative effects of the Drought Plan with the Bristol Water WRMP, other water company Drought Plans and WRMPs, Environment Agency Drought Plans (and any other drought plans prepared by other bodies, such as the Canal & River Trust). Neighbouring water companies were included as consultees to the draft Drought Plan and associated SEA Environmental Report in order to help identify any additional trans-boundary issues that have not been identified in the SEA.

- 
- Assessment of potential cumulative effects of the Bristol Water Drought Plan with any other identified relevant programmes, plans and projects that may be in place / implemented during the 5-year period of the Drought Plan.

One of the limitations of the cumulative or in-combination assessment of Bristol Water's Drought Plan is that whilst an environmental appraisal of each measure can be undertaken, the lack of predictability of which measures will be implemented in any particular drought event means that it is impossible to provide a definitive cumulative assessment of the impacts of the plan for a possible future drought event. Cumulative assessments have been undertaken assuming as a worst case that the implementation of measures could occur simultaneously. Spatial proximity and therefore potential impacts on a common receptor is the primary consideration (e.g. the same designated area or reach of river).

Due to the uncertainty of timing of implementation of drought measures, the findings of the SEA will need to be reviewed during an actual drought and an updated cumulative assessment made of the measures proposed for implementation at that time, taking account of the findings of the cumulative assessments presented in this Environmental Report.

## 5 Assessment of Drought Options

### 5.1 Drought Plan Options Under Consideration

Demand management measures which have been assessed are shown in **Table 5.1**. Supply augmentation measures which have been assessed are shown in **Table 5.2**.

### 5.2 Assessment of Options against SEA Objectives

Assessment of the potential drought management options has been carried out in accordance with the methodology described earlier in Section 4. Appraisal framework assessment tables have been completed for each drought option, and are presented in full in **Appendix F**. A summary of the assessments are presented in Sections 5.3, 5.4 and 5.5 as colour-coded VE matrices. For each drought option and each SEA topic listed in the left hand column of **Table 4.2**, the VE matrix summarises the likely significance of residual effects. The colour coding represents a range from major adverse effects in red through to major beneficial effects in dark green. The definitions of these significance levels have been set out earlier in Section 4.2.2.

#### Legend

Colour		Significance of Effect
	Dark Green	Major Beneficial
	Mid Green	Moderate Beneficial
	Light Green	Minor Beneficial
	Pale blue	Negligible
	Yellow	Minor Adverse
	Orange	Moderate Adverse
	Red	Major Adverse
	NONE	NOT APPLICABLE

### 5.3 Demand Management Options

A visual summary of SEA conclusions for each of the demand management options in Bristol Water's Drought Plan 2017 is provided in **Table 5.1**. The completed appraisal tables for each of the drought options are provided in **Appendix F**.

Demand management measures typically provide moderate beneficial effects such as helping to protect and enhance health and well-being through maintaining water supplies for essential use, and promoting efficient and sustainable use of water. Major adverse effects have been identified with respect to demand management measures that prohibit a wide range of non-essential water uses (adverse effects on the local economy and certain water-dependent businesses) and the potential application of an Emergency Drought Order (adverse effects on the wider population and businesses across the Bristol Water supply area).

**Table 5.1 Visual evaluation matrix summary for demand side options**

Objectives		SEA Topic																Commentary
		Biodiversity, fauna and flora		Population and human health			Material assets and resource use		Water			Soil, geology and land use	Air and Climate			Archaeology and cultural heritage	Landscape and visual amenity	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	5.1	6.1	6.2	6.3	7.1	8.1	
Appeals for restraint	Adverse																	No adverse impacts have been identified for this drought plan option.
	Beneficial																	Moderate beneficial impacts include reducing demand for water and securing essential supplies of water for customers/businesses. Reducing the demand for water will also have minor beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.
Temporary Use Ban (TUB)	Adverse																	A minor adverse effect has been identified in terms of promoting a sustainable economy due to the affect of the ban on some businesses that rely on domestic water-using appliances/uses (e.g. sprinklers/hosepipes) in their line of work (e.g., landscaping/horticulture).
	Beneficial																	Moderate beneficial impacts include reducing the demand for water and securing supply of water for customers/businesses. Reducing the demand for water will also have minor beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.
Drought Order to prohibit prescribed non-essential water uses (NEUB)	Adverse																	Major adverse impact effects on businesses/economy are predicted due to the potential for restrictions on water use to result in business loss in some cases if water-dependent operations have to be suspended. Minor adverse effects are predicted due to the impacts on certain recreational water uses, the setting of some heritage assets and local visual amenities.
	Beneficial																	Beneficial effects include a reduction in the demand for water, maintenance of water flows/levels, maintenance of essential water supplies to consumers in extreme drought conditions.
Emergency Drought Order	Adverse																	Significant major adverse effects are predicted relating to the implementation of the emergency drought order with impacts for population and human health, including potential drinking water quality issues, impacts for water-dependent recreational assets and businesses/economy. An emergency drought order is not consistent with sustainable resource use or providing secure water supplies for people and businesses, and will cause significant disruption to domestic and commercial life. Other adverse effects include potential minor impacts on the setting of certain heritage assets and visual amenities.
	Beneficial																	Moderate beneficial effects include a reduction in the demand for water, maintenance of water flows/levels, maintenance of a water supply to consumers in an extreme drought.

## 5.4 Honeyhurst Well Option

A visual summary of SEA conclusions for the Honeyhurst Well supply augmentation option is provided in **Table 5.2**. The more detailed appraisal table is provided in **Appendix F**. The appraisal has also been informed by the Habitats Regulations Assessment (HRA) screening conclusions (see Section 5.6) and the Water Framework Directive assessment (see Section 5.7).

The Honeyhurst Well source is the only supply augmentation measure that does not require a drought permit. The abstraction is currently licensed (with a daily annual average abstraction limit of 4.11MI/d and a reliable, dry year water supply of 2.4MI/d as an annual average), but the source has not been used for 20 years. An assessment of the potential risks of deterioration of WFD water body status for relevant water bodies has therefore been carried out to inform the SEA objective on WFD (see Section 5.7). The proposed drought plan trigger for bringing the Honeyhurst Well source back into supply is as reservoir storage enters Drought Management Zone 4. It is the only option that would require some construction activity, the lead in time for which is estimated to be approximately six months, although some pre-planning feasibility work has already been carried out. The option would be used to aid the refill of Cheddar Reservoir with respect to a one-year drought and to provide support to the local supply area regarding a two-year drought.

As a result of the construction requirements for reinstating this source (principally, a 4.2km pipeline to Cheddar Water Treatment Works), there are certain construction-related effects that have been identified and which, in some cases, require specific mitigation (beyond standard construction good practice methods). The pipeline crosses many roads and the felling of some trees may be required. Therefore, there is potential for adverse effects with respect to the SEA topics 'Biodiversity Fauna and Flora', 'Population and Human Health', 'Landscape and Visual Amenity' and 'Archaeology and Cultural Heritage'. Protected species surveys should be undertaken and specific bat mitigation measures (as highlighted in the HRA screening report) with respect to Mendip Woodlands SAC and North Somerset and Mendip Bats SAC: this is discussed further in Section 7. Due to the construction requirements, along with the additional pumping and treatment requirements during operation, adverse effects have also been identified with respect the SEA topic 'Air and Climate'.

Once the source is in operation, no adverse effects on the water environment are anticipated considering the characteristics of the Wells WFD groundwater body (GB40902G804700), which is of good quantitative and chemical status. However, there is some uncertainty because the source has not been operated for around 20 years and has not formed part of the Environment Agency's recent WFD catchment assessments. A low risk of the reinstated abstraction having adverse effects on the dependent surface water body (the River Axe) has been identified and minor adverse effects predicted with respect to the SEA Water topic. This will need to be further assessed and confirmed through monitoring to demonstrate 'no deterioration' under the WFD as a result of bringing this source back into supply, as discussed further in Section 7.

## 5.5 Drought Permit Options

A visual summary of SEA conclusions for each of the drought permit options considered for the Bristol Water Drought Plan 2017 is provided in **Table 5.3**. The detailed appraisal tables for each of the drought options are provided in **Appendix F**. The appraisals have also been informed by the Habitats Regulations Assessment (HRA) screening conclusions (see Section 5.6) and the Water Framework Directive (WFD) assessment (see Section 5.7).

There are many similarities between the three drought permit options. Each one would provide a positive benefit in helping to sustain water levels within the respective reservoirs during a period of severe drought. In light of this, all of the drought permit options will have minor or moderate beneficial effects with respect to 'Population and Human Health', as the drought permits will help to maintain essential public water supplies during drought conditions.



There are no construction requirements associated with any of the drought permits. All involve a reduction in compensation flow/prescribed flow to downstream watercourses. In all cases, the river flow and river level effects are of greatest significance in the short sections of river just downstream of where the reservoir flow releases are made. These effects on flow and water level are considered to be of moderate significance and result in moderate adverse effects in relation to the SEA topic 'Biodiversity, fauna and flora' and the river flow/level SEA objective under the 'Water' topic area. In the lower reaches of the hydrological zone of influence associated with each option, greater flow helps to lessen these effects and, in particular, the respective watercourses are level controlled to varying degrees, which lessens the effects on river water level, although reductions in velocity would still occur.

The drought permit options are, however, located in different catchments, and consequently the impacted river reaches have different characteristics; in addition, the timing and duration of drought permit implementation differs between each option. The Cheddar Reservoir Cheddar Yeo prescribed flow reduction involves a reduction from the required 6.8MI/d during the period 1<sup>st</sup> December to 14<sup>th</sup> May to 3.4MI/d. It would only be operated during this period and therefore for the remainder of the year (15<sup>th</sup> May to 30<sup>th</sup> November) the Cheddar Yeo would receive the required prescribed flow of 6.8MI/d. The drought permit flow reduction would therefore take place during the cooler months of the year, which reduces the potential adverse effects with respect to water quality which would be greater in the warmer months of the year. The two impacted reaches are shorter than those associated with the other two drought permit options.

The Blagdon Reservoir compensation flow reduction to the Congresbury Yeo from 8.6MI/d to 4.0MI/d would impact a greater length of river relative to the Cheddar Reservoir drought permit option. It would be operated in the summer and autumn period (15<sup>th</sup> May to 30<sup>th</sup> November), so the potential water quality effects would likely be of greater significance. Flow impacts decrease with distance downstream of the reservoir and in the lower impacted reach, the effects are limited to velocity reduction due to water level controls being in place in the river in this reach. Three of the water quality pressures in the hydrological zone of influence discharge into the Congresbury Yeo in close proximity to Blagdon Reservoir and therefore into the river reach where the proportional reduction in flow is at its greatest. During low flows, the limit of the hydrological zone of influence (velocity reduction only) would be at the tidal limit (the Severn Estuary).

The Chew Reservoir drought permit compensation flow reductions would be specific to the periods 1<sup>st</sup> December to 30<sup>th</sup> April (6.8MI/d to 3.4MI/d) and 1<sup>st</sup> May to 31<sup>st</sup> July (14.32MI/d to 7 MI/d); it deliberately excludes the period 1<sup>st</sup> August to 30<sup>th</sup> November. The identified hydrological zone of influence is greater than that identified for the other two drought permit options. The characteristics of flow impacts include some reductions to wetted with and velocity even in the lower impacted reaches. The River Chew is considered more sensitive to the drought permit impacts in terms of its ecological baseline.

Table 5.2: Visual evaluation matrix summaryfor Honeyhurst Well supply augmentation option

Objective		SEA Topic																Commentary
		Biodiversity, fauna and flora		Population and human health			Material assets and resource use		Water			Soil, geology and land use	Air and Climate			Archaeology and cultural heritage	Landscape and visual amenity	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	5.1	6.1	6.2	6.3	7.1	8.1	
Honeyhurst and Rodney Stoke (Well Head)	Adverse																	Moderate adverse, medium-term, reversible effects are predicated regarding the biodiversity, fauna and flora due to the potential effects of construction. Mitigation measures will, over time, address adverse impacts. Specific construction mitigation measures will be required with respect to Mendip Woodlands SAC, North Somerset and Mendip Bats SAC and Somerset Levels, Moors SPA. Minor adverse, short-term, temporary effects have been predicted regarding population and human health category, these relate to construction effects (e.g. nuisance) and will be mitigated as far as possible. Minor adverse effects have been predicted for water, soil, geology and land use and archaeology and cultural heritage topic. Mitigation will be required to address some of these potential risks. The Honeyhurst Well abstraction is proposed to abstract from the Wells groundwater body (GB40902G804700) which is of good quantitative and chemical status. There is low risk of the reinstated abstraction having adverse effects on the dependant surface water body (River Axe). Although, there is low risk that the reinstated abstraction will have an impact on the River Axe and its WFD ecological status. This will need to be further assessed and confirmed through monitoring to demonstrate ‘no deterioration’ under the WFD as a result of bringing this source back into supply. Moderate adverse, medium-term, reversible effects are predicted with respect to the SEA topic landscape and visual amenity due to construction effects within the Mendips AONB. Moderate adverse, short-term, temporary effects are anticipated regarding the air and climate category as the option will require new infrastructure and energy use during construction. Effects concerning the other category (material assets and resource use) have been assessed as negligible.
	Beneficial																	Moderate beneficial effects are predicted with respect to population and human health, implementation of the drought permit will help to maintain essential public water supplies (provision of up to an additional 2.4 Ml/d of water) during drought conditions. Moderate beneficial effects are also expected in regard to improved resilience of water supplies in drought.

Table 5.3: Visual evaluation matrix summary for drought permit options

Objectives		SEA Topic																Commentary
		Biodiversity, fauna and flora		Population and human health			Material assets and resource use		Water			Soil, geology and land use	Air and Climate			Archaeology and cultural heritage	Landscape and visual amenity	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	5.1	6.1	6.2	6.3	7.1	8.1	
Reduction in compensation flow release from Blagdon Reservoir	Adverse																	Moderate adverse, short-term, temporary effects regarding the water topic are predicted due to reduction in river wetted width, depth and flow velocity particularly in the upper reaches of the zone of hydrological influence. As a result of the flow impacts, there could be a short-term reduction in dilution capacity regarding a number of sewage treatment work discharges resulting in increased water quality pressure and increased risk to WFD deterioration. Moderate adverse, medium-term, reversible effects are predicted with respect to biodiversity, fauna and flora due to potential adverse effects to macroinvertebrates and fish, but these are considered to be temporary and reversible. Moderate adverse, short term, temporary effects are predicted with respect to the category of landscape and visual amenity due to water level changes and effects within the Mendips AONB. Effects concerning Soil, geology and land use; Air and Climate and Archaeology and cultural heritage are considered to be minor or negligible, and temporary in nature.
	Beneficial																	Moderate beneficial effects are predicted with respect to population and human health: implementation of the drought permit will help to maintain essential public water supplies (provision of up to an additional 4 MI/d of water) during drought conditions. Moderate beneficial effects are also expected in regard to improved resilience of water supplies in drought.
Reduction in compensation flow release from Chew Reservoir	Adverse																	Moderate adverse, short-term, temporary effects regarding the water topic are predicted due to reduction in river wetted width, depth and flow velocity particularly in the upper reaches of the hydrological zone of influence. As a result of the flow impacts, there could be a short-term reduction in dilution capacity regarding a number of sewage treatment work discharges resulting in increased water quality pressure and increased risk to WFD deterioration. Moderate adverse, medium-term, temporary effects are predicted with respect to biodiversity, fauna and flora including moderate adverse effects to macroinvertebrates in the upper reach of the hydrological zone of influence. Moderate adverse effects on macroinvertebrates and fish are considered to be moderate, temporary and reversible. Moderate adverse, short term, temporary effects are predicted with respect to the category of landscape and visual amenity due to water level changes and effects within the Mendips AONB. Effects concerning the other categories (soil, geology and land use; air and climate, archaeology and cultural heritage) are considered to be minor or negligible, and temporary in nature.
	Beneficial																	Moderate beneficial effects are predicted with respect to population and human health: implementation of the drought permit will help to maintain essential public water supplies (provision of up to an additional 7MI/d or 3.4 MI/d depending on time of year) during drought conditions. Moderate beneficial effects are also expected in regard to improved resilience of water supplies in drought.
Reduction of prescribed flow at Cheddar Reservoir	Adverse																	Moderate adverse, short-term, temporary effects regarding the water topic are predicted due to reduction in river flows, wetted width and depth in the upper reaches of the Cheddar Yeo. Effects in the lower reaches (downstream of Hythe) are limited to reductions in velocity only. As a result of the flow impacts, there would be a short-term reduction in dilution capacity regarding Cheddar/Hythe STW discharges resulting in increased water quality pressure and increased risk to WFD deterioration. Moderate adverse, medium-term, temporary effects are predicted with respect to biodiversity, fauna and flora including moderate adverse effects to macroinvertebrates in the upper reach. Moderate adverse, short-term, temporary effects are predicted with respect to landscape and visual amenity due to water level changes and effects within the Mendips AONB. Effects concerning the other SEA topics (soil, geology and land use; air and climate, archaeology and cultural heritage) are considered to be minor or negligible,and temporary in nature.
	Beneficial																	Moderate beneficial effects are predicted with respect to population and human health: implementation of the drought permit will help to maintain essential public water supplies (provision of up to an additional 3.4 MI/d of water) during drought conditions. Moderate beneficial effects are also expected in regard to improved resilience of water supplies in drought.

## 5.6 Habitats Regulations Assessment

Alongside the SEA process, the same Drought Plan options have also been assessed in the context of the requirements of the Habitats Directive. The associated national Habitats Regulations requires the Drought Plan and potential drought management options to be screened for any likely significant effects on European sites or Ramsar sites. A Habitats Regulations Assessment (HRA) screening has therefore been carried out (see separate HRA Screening Report) and the findings of this screening assessment have been used to inform the SEA, as summarised in **Appendix F** for the supply augmentation and drought permit options under the SEA Biodiversity, Flora and Fauna topic area. The HRA screening has had regard to the conservation objectives of the relevant designated sites and species, as well as the Commons Standards Methodology which supports the assessment of hydrological and water quality effects on designated sites and features. The HRA screening identified no likely significant effects on any European site or Ramsar site as a result of implementing any of the drought management options under consideration.

## 5.7 Water Framework Directive Assessment

Alongside the SEA process, the same Drought Plan options have also been assessed in the context of the requirements of the Water Framework Directive (WFD). The findings have been used to inform the SEA in relation to the 'Water' topic objectives which collectively cover the key requirement of the WFD to take measures to achieve good ecological status and avoid any deterioration (including temporary deterioration) to the status 'class' of each key WFD assessment element for each designated water body (the elements concerned vary depending on the type of water body, e.g. groundwater body or surface water body). **Appendix F** provides further details as to the likely effects of the drought management measures on the water environment for each of the supply augmentation and drought permit options in relation to fish, hydromorphology and water quality. WFD assessment summary tables are provided in **Appendix G**.

The Drought Plan Guideline (2015) requires that an assessment is provided 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 the WFD River Basin Management Plans (RBMPs).

The 2015 RBMPs includes:

- 2015 classification results that form the baseline for assessing deterioration in water body status for the 6-year period December 2015 to 2027;
- Updated water body status objectives;
- Updated Protected Area objectives; and
- Programme of Measures required to help achieve the stated water body objectives.

The Environmental Assessment for Water Company Drought Plans Guidance (2016) states that the WFD Articles most relevant to drought plans are:

- 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 Guidance specifically requires that the potential impacts of the drought plan measures on the following are considered:

- 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 measures to address priority substances, priority hazardous substances and other pollutants.

In accordance with the above guidance, Bristol Water has assessed the potential implications of supply-side measures on WFD objectives, both in isolation and in-combination. The assessment considers

the following WFD objectives in relation to each of the four potential drought plan supply augmentation measures:

WFD objectives:

- 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.
- 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.
- 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

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 measures only considers the impact of implementation against the baseline of such drought conditions.

Table 5.4 shows the conclusions of the WFD assessment for each supply-side option; no “in-combination” adverse effects on the WFD objectives between the four options are considered likely. Each of the drought permit options has a benefit of maintaining water levels within the relevant reservoir during a period of drought and therefore no impact is expected on these WFD waterbodies. As a result, the potential impact on WFD objectives only relates to the downstream surface water (river) water bodies that may be affected by the drought permits (as summarised in Section 5.4 and 5.5 above). The findings are considered precautionary pending further evaluation as part of developing Environmental Assessment Reports for each drought permit option (these are currently being prepared by Bristol Water).

**Table 5.4 WFD assessment conclusions for supply augmentation and drought permit options**

WFD Objectives						
Option	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
Honeyhurst Well	Negligible risk of temporary deterioration in status	No likely adverse effects	No likely adverse effects	No likely adverse effects	No likely adverse effects provided appropriate mitigation measures are in place during construction activities	No likely adverse effects
Drought Permit at Blagdon Reservoir	Low risk of a temporary deterioration in status but risk will be mitigated as far as practicable	No likely adverse effects	No likely adverse effects	No likely adverse effects	No likely adverse effects with appropriate mitigation	No likely adverse effects

Drought Permit at Chew Reservoir	Low risk of a temporary deterioration in status but risk will be mitigated as far as practicable	No likely adverse effects	No likely adverse effects	No likely adverse effects	No likely adverse effects with appropriate mitigation	No likely adverse effects
Drought Permit at Cheddar Reservoir	Low risk of a temporary deterioration in status but risk will be mitigated as far as practicable	No likely adverse effects	No likely adverse effects	No likely adverse effects	No likely adverse effects with appropriate mitigation	No likely adverse effects

For the drought permit options, a low risk of temporary (but not permanent) deterioration in WFD water body status between status class for one or more WFD elements in the downstream watercourse has been identified: note this is a risk, not a certainty and mitigation measures will be deployed to minimise this temporary risk as far as practicable. These mitigation measures will be considered further as part of the development of the Environmental Assessment Reports for each drought permit option (currently being prepared by Bristol Water). No risk of permanent deterioration in WFD status class for any element is considered likely.

All the other WFD objectives are met provided that appropriate mitigation measures are deployed in relation to certain WFD Protected Areas (Objective 5).

## 5.8 Role of the SEA in developing the Drought Plan

The assessments described above, including the associated HRA and WFD assessments, have been used by Bristol Water in helping to determine the options to be included in its Drought Plan and their timing and phasing for implementation in relation to the company's drought management triggers/zones (see **Figure 1.3**).

The effects of the demand management measures relating to appeals to customers for restraint in water use are beneficial with no adverse effects identified. Consistent with the SEA findings, this measure would be the first of the options to be implemented (when reservoir storage reaches Zone 3). The SEA identifies two minor adverse effects associated with implementation of the Temporary Use Ban and as result it is proposed that this measure is implemented as the reservoir storage reaches Zone 4. The Non-Essential Use Ban Drought Order has been assessed as having one major adverse effect and three minor adverse effects, and should be considered for implementation in relation to non-household customers when reservoir storage reaches Zone 5.

The Emergency Drought Order is identified by the SEA as leading to some major adverse effects and therefore should only be implemented as a last resort at Zone 6 commensurate with the severity of the drought situation where reservoir storage is extremely depleted and the maintenance of water supplies to customers is at a very high risk of failure.

The effects identified by the SEA of the Honeyhurst Well option include several minor adverse effects and one moderate adverse effect (relating to the pipeline construction only). The overall adverse effects are considered to be lower than those relating to the drought permit options, and in view of the lead time required to commission this measure, it is considered appropriate to consider invoking this measure at Zone 3 (for implementation in Zone 4), at the same time as introducing the Temporary Use Ban.

The adverse effects of the three drought permit options identified by the SEA are overall similar in magnitude, although the effects on the water environment are slightly greater for the Chew Reservoir drought permit option. No major adverse effects have been identified, however, moderate adverse effects have been identified against a number of different objectives suggesting these options should be considered for implementation in Zone 5 after the introduction of the Temporary Use Ban and at the same time as the Non-Essential Use Ban.



## 6 Cumulative Assessment

### 6.1 Introduction

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

### 6.2 Demand Management Options

#### 6.2.1 Cumulative effects of demand management options

The matrix in **Figure 6.1** illustrates potential incompatibility and cumulative impacts between the demand management measures.

**Figure 6.1 Cumulative impacts matrix: demand management measures**

Temporary Use Ban (TUBS)			
Non Essential Use Ban (NEUB)			
Emergency Drought Order			
<b>Demand Management Measures</b>	Appeals for restraint	Temporary Use Ban (TUBS)	Non Essential Use Ban (NEUB)

#### Key

	No cumulative effects identified or beneficial cumulative effects anticipated
	Adverse impacts anticipated
	Options are sequential
	Uncertain – Insufficient information available to undertake assessment

It is acknowledged that the demand management measures set out in **Figure 6.1** are sequential, in each case, the first demand management measure will always remain in place while the next measure is implemented but the effects between the different options are not additive. No cumulative impacts between these demand management options have been identified.

#### 6.2.2 Cumulative effects with supply augmentation and drought permit options

Demand management measures serve to reduce pressure on water resources and will have a positive influence on both supply augmentation and drought permit options by reducing customer demand for water, and therefore helping to reduce the abstraction of water from the environment.

### 6.3 Cumulative Effects Between Supply Augmentation and Drought Permit Options

The cumulative effects of each supply side and drought permit/order drought option with each other have been assessed and are summarised in the matrix presented in **Figure 6.2** The assessments

have been informed by the 2007 EMPs, and mapping of locations of drought options, surface water and groundwater catchments.

**Figure 6.2: Cumulative impacts matrix: supply augmentation and drought permit options**

Reduction of Blagdon Reservoir compensation flow			
Reduction of Chew Reservoir compensation flow			
Reduction of Cheddar Yeo prescribed flow			
Honeyhurst well			
<b>Supply side drought measures</b>	Reduction of Blagdon Reservoir compensation flow	Reduction of Chew Reservoir compensation flow	Reduction of Cheddar Yeo prescribed flow

The legend used is as follows:

**Key**

	No cumulative impacts
	Mutually exclusive schemes, i.e. use the same site or the same resource
	Potential adverse construction impacts if constructed simultaneously
	Potential cumulative impacts in operation

Blagdon Reservoir and the compensation flow releases to the Congresbury Yeo are in a different catchment to all of the other supply augmentation and drought permit options. Similarly, Chew Reservoir and its compensation flow releases to the River Chew are also in a different catchment to the other options. The Honeyhurst Well option would abstract from the Wells WFD groundwater body (GB40902G804700). It has been identified that there is low risk of this reinstated abstraction having impacts on the dependent surface water body, the River Axe. The Cheddar Reservoir reduced prescribed flow drought permit option is anticipated to result in hydrological effects within the Cheddar Yeo that would extend to the confluence with the River Axe. Considering this, the potential for cumulative effects to the River Axe is unlikely and no in-combination effects on the Severn Estuary SAC, SPA and Ramsar (which is located 14km further downstream from the confluence of the Cheddar Yeo and River Axe) are anticipated. A monitoring programme will be required to demonstrate 'no deterioration' under the WFD as a result of bringing the Honeyhurst Well source back into supply as well as implementing the Cheddar Yeo drought permit option.

## 6.4 Cumulative Effects with Existing Relevant Plans, Programmes and Projects

### 6.4.1 Environment Agency Drought Plans

The potential for cumulative effects of Bristol Water's Drought Plan with relevant Environment Agency's local and national drought plans has been assessed.

An overview of the process of using drought actions and triggers is provided in the Environment Agency drought plans. Actions described include communications (internal and external), monitoring and applying for drought orders in a limited number of situations.

External communications may have positive in-combination effects with Bristol Water's media/water efficiency campaign for customer restraint in water use, as drought communication messages may reinforce each other, thereby resulting in increased demand savings.

Potential Environment Agency environmental drought order actions do not have the potential for in-combination impacts with Bristol Water's drought management options as they relate to different river catchments.

### 6.4.2 Other Water Company Drought Plans

Assessment of the potential cumulative impacts with drought management options listed in neighbouring water companies' current drought plans has been undertaken. It should be noted that all water company Drought Plans are subject to review on timescales that may not be aligned with the timescale of Bristol Water's Drought Plan update. The information used to carry out these assessments is the most up to date information available at the time of writing, but the assessments should be reviewed at the time of implementing any drought plan measures to ensure that no changes to the neighbouring water company drought options have been made in the intervening period, and that the assessment in this Environmental Report remains valid.

#### Wessex Water

Wessex Water indicates that it would deploy demand management actions including water efficiency campaigns to both domestic and business customers, increased leakage reduction, and temporary water use restrictions. These would complement the demand management measures included in Bristol Water's Drought Plan and any cumulative effects are likely to be beneficial.

Wessex Water has five small water supply exports to Bristol Water which supply discrete areas within the Bristol Water supply region. In its 2013 Drought Plan, Wessex Water identifies that it does not envisage the need to restrict these transfers during a drought.

Supply augmentation options in Wessex Water's Drought Plan relate to changing its strategy on the priority of where water is abstracted from and/or the distribution of water that is abstracted under normal conditions. No potential for in-combination or cumulative effects with the Bristol Water Drought Plan have been identified. Use of standby water sources is limited to a source near Bath that would only operate in times of dry weather. The abstraction has an existing licence to abstract up to 7 MI/d from the River Avon. The River Axe defines the end of the hydrological zone of influence with respect to Bristol Water's Cheddar Reservoir drought permit option. The operation of Wessex Water's source near Bath will not have cumulative effects with the Cheddar Reservoir drought permit option.

Wessex Water's drought plan includes a number of drought permits/orders that could be used in drought. The Bridgwater and Taunton Canal additional abstraction option would pump raw water from the canal to augment reservoir storage. The water abstracted from the canal under this option would otherwise flow into the tidal River Parratt. The Clatworthy Reservoir compensation flow reduction and Hele Bridge additional abstraction options would affect flows in the River Tone, which flows into the River Parrett. The Sutton Bingham compensation flow reduction and Clifton Maybank additional abstraction are both options that could affect flows in the River Yeo (not the Cheddar Yeo or the

Congresbury Yeo) which flows into the River Parrett. Bristol Water's drought permit and supply augmentation options are not hydrologically linked to the Parrett catchment and therefore no cumulative effects are anticipated.

#### Severn Trent Water

The boundary of the Severn Trent Water supply area is over 50km away from Bristol Water's supply augmentation and drought permit options. There is no potential for hydrological connectivity and no cumulative effects between the drought management options in Bristol Water's Drought Plan and Severn Trent Water's Drought Plan (January 2014) are anticipated.

#### Thames Water

The boundary of the Thames Water supply area is over 40km away from Bristol Water's most northern supply augmentation and drought permit options. There is no potential for hydrological connectivity and no cumulative effects between the drought management options in Bristol Water's Drought Plan and the measures included in the Thames Water Drought Plan (October 2016) are anticipated.

### 6.4.3 Water Resource Management Plans

#### Bristol Water

Bristol Water will be updating its Water Resource Management Plan (WRMP) over the next two years, with a new plan due to be published in 2019. Potential cumulative effects with the Drought Plan have therefore been considered with reference to the company's current WRMP published in 2014. There are no supply schemes identified within Bristol Water's WRMP 2014 that are due to be operational within the time period of the Drought Plan 2017. The only options that are identified that cover the period of the Drought Plan are demand management measures or reductions in bulk water transfers out of the supply area. It is noted that the Honeyhurst Well source forms a scheme in the preferred programme in WRMP14 for potential future implementation beyond the period covered by the Drought Plan 2017.

#### Wessex Water

Wessex Water has no projected supply deficit and, as such, its WRMP14 proposes no supply augmentation options. No cumulative effects are therefore likely to occur with Bristol Water's Drought Plan.

#### Severn Trent

The boundary of the Severn Trent supply area is over 50km away from Bristol Water's supply augmentation and drought permit options. There is no potential for hydrological connectivity and cumulative effects between drought options in Bristol Water's Drought Plan and the supply augmentation options contained in Severn Trent Water's WRMP14 (May 2014).

#### Thames Water

There are no options that form part of the Thames Water WRMP14 preferred programme of options with the potential to result in cumulative effects with the drought options in Bristol Water's Drought Plan.

### 6.4.4 Other Plans and Projects

#### River Basin Management Plans

Most of Bristol Water's supply areas falls within the Severn river basin district River Basin Management Plan (RBMP). Part of the supply area (including Cheddar Reservoir) falls within the South West river basin district RBMP.

Both the Severn river basin district RBMP and the South West river basin district RBMP describes the planned steps to implement the measures required to achieve the environmental objectives of the Water Framework Directive (WFD). The plans provide the framework for protecting and enhancing the water environment. The SEA of the Severn river basin district RBMP and the SEA of the South West river basin district RBMP determined that the plans were likely to have significant positive effects on the environment, particularly in respect of biodiversity and water and that any local negative effects would expect to be mitigated during implementation. No cumulative impacts between the Severn river basin district RBMP and the South West river basin district RBMP and the Bristol Water drought plan options have been identified.

### National Policy Statements

National planning policy guidance (for developers and inspectors) is set out in National Policy Statements (NPSs). A number of these NPSs have been published and set out the definition, and in some cases the location, of Nationally Significant Infrastructure Projects (NSIPs). Of the twelve NPS only two detail the location of options (Waste Water Treatment (England only) and Nuclear Power EN-6) and therefore the potential for cumulative effects can only be identified with respect to these.

The National Policy Statement for Wastewater<sup>11</sup> states the policy of reducing demand for wastewater infrastructure by reducing domestic and industrial wastewater production and by implementation of Sustainable Urban Drainage Systems. Only two major infrastructure projects are put forward, both in the south east of the UK and therefore are not relevant to the Bristol Water Drought Plan; no cumulative effects are anticipated.

The Nuclear Power NPS (EN-6) sets out eight potentially suitable sites for the deployment of new nuclear power stations in England and Wales before the end of 2025. Of these sites, one site (Oldbury) is located within the Bristol Water supply area, whilst a second site (Hinkley Point) is located approximately 10km to the south-west of the Bristol Water supply area. The remaining sites are considered too distant from the Bristol Water supply area for in-combination effects to occur. Information from the NIP website<sup>12</sup> indicates that proposals for the Oldbury new nuclear power station are currently at the Pre-Application stage. The project timings are uncertain as the shareholders of the promoter (Horizon) are seeking new owners, and it is currently assumed that work is unlikely to start during the period covered by Bristol Water's Drought Plan.

The proposals for the Hinkley Point C new nuclear power stations have been accepted and are described further below.

Hinkley Point C Connection (National Grid) will involve construction work that would mainly follow the M5 (10km -18km from any drought plan options) to Hinkley Point. Considering these distances, the potential for direct cumulative effects is considered unlikely. Construction will take place within the Mendip Hills AONB: Honeyhurst Well drought option also involves small scale construction in the Mendip Hills AONB. There is therefore the potential for indirect cumulative effects to this receptor. However, construction effects for the Honeyhurst Well option will either be contained within an existing Bristol Water operational site or a small linear corridor for the pipeline. Therefore, overall cumulative effects during any construction (if they were to coincide) are considered negligible.

### 6.4.5 Cumulative effects with any other identified relevant projects

Other current National Infrastructure projects listed for the South West<sup>13</sup> are considered too distant from the drought plan options and respective zones of hydrological influence to result in any cumulative effects.

<sup>11</sup> Defra (2012) *National Policy Statement for Wastewater*. March 2012.

<sup>12</sup> <https://infrastructure.planninginspectorate.gov.uk/>

<sup>13</sup> <https://infrastructure.planninginspectorate.gov.uk/projects/South%20West/>

## 7 Mitigation and Monitoring

### 7.1 Overview

Key stages of the SEA process include Task B5: *Mitigating adverse effects*, Task B6: *Proposing measures to monitor the environmental effects of plan or programme implementation* and Stage E: *Monitoring the significant effects of the plan or programme on the environment* (see Section 1.5, **Table 1.5**). The sections below describe how these tasks have been addressed and how Bristol Water intends to ensure that mitigation measures are implemented for any adverse effects that are identified and the means by which the environmental performance of the Drought Plan can be assessed.

### 7.2 Mitigation Measures

Mitigation may be defined as a measure to limit the effect of an identified significant impact or, through the most successful application, avoid the adverse impact altogether, the latter being the preferred option.

Consideration of mitigation measures has been an integral part of the SEA process. The methodology for the assessment of the drought management options is provided in Section 4. The SEA appraisals have been based on residual impacts, i.e. those impacts likely to remain after the implementation of reasonable mitigation measures (a full list of mitigation measures are provided in **Appendix F**). Mitigation measures include adopting best practice construction methods for laying of new pipelines to avoid noise and dust nuisance, runoff of sediment to nearby streams and preventing pollution from plant and machinery; they also include carrying out monitoring of sensitive environments before commencing operational changes so that appropriate protection measures can be agreed to safeguard sensitive species or features.

Certain assumptions have been made regarding mitigation, notably:

- Where suitable mitigation measures are known and identified (e.g. as informed through previous Environmental Assessment Reports and other assessments) these have been taken into account, such that the resultant residual impact has been determined.
- In line with recommendations made in the UKWIR SEA Guidance<sup>14</sup>, the SEA appraisals have assumed the implementation of reasonable mitigation measures, such as the use of good construction practice. This is particularly applicable to the Honeyhurst Well option where some construction work would be needed.

As described earlier, during implementation of a specific drought management measure, appropriate monitoring will be undertaken to track any potential environmental and/or social effects which will in turn trigger deployment of suitable and practicable mitigation measures as may be available.

It is recommended that the Blagdon, Chew and Cheddar Reservoir drought permit options are subject to an Environmental Assessment Report (EAR) and Honeyhurst Well is also assessed in relation to “no deterioration” requirements under the WFD prior to applying for / implementing these options. These assessments will help to confirm the mitigation measures that may be necessary in relation to these options. Preparation of the Environmental Assessment Reports is currently underway and nearing completion (May 2018).

Bristol Water is currently updating its Water Resources Management Plan (WRMP), in line with the updated WRMP guidance<sup>15</sup> over the next 12 months and, as part of this process, it is undertaking supply assessments to confirm if the drought permit options contained in the Drought Plan remain the most appropriate options for drought management in the future. Once Bristol Water has completed this assessment, the company will set out how it intends to achieve ‘permit ready’ status for any drought permit options that it needs to retain in its Drought Plan. This may be achieved by publishing an

<sup>14</sup> UKWIR (2012) Strategic Environmental Assessment and Habitats Regulations Assessment of Drought Plans (UKWIR Project WR/02/A). Prepared by Cascade Consulting.

<sup>15</sup> Defra, Welsh Government, Ofwat, Environment Agency, Natural Resources Wales (2016) Final Water Resources Planning Guideline



'addendum' to the final drought plan, accompanied by a review of the accompanying SEA, HRA and WFD assessments.

## 7.3 Monitoring Requirements

Monitoring is required to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures.

As described in Section 1.2.3, Drought Plans encompass a basket of measures that will only be implemented if and when required because of the unpredictable occurrence of a drought event, and thus the actual impact of the plan over its life is subject to very significant uncertainties.

Bristol Water's Drought Plan includes a range of possible measures to allow Bristol Water to respond to a particular drought in the most appropriate way. It is impossible to predict in advance which and how many of the measures will be required to respond to each particular drought event. Correspondingly, it is therefore difficult to prescribe precise monitoring activities for the effects of the Drought Plan as whole, and it is more appropriate to consider monitoring requirements for drought management options with significant environmental or social effects should these options be implemented during an actual drought.

In relation to demand management measures, it is recommended that monitoring of customer impacts is carried out during and after the implementation of any demand management measures to assess their effectiveness and confirm the effects predicted in this Environmental Report. This is likely to take the form of structured surveys with a statistically valid sample of household and/or non-household customers, as applicable. UK Water Industry Research (UKWIR) guidance is available on methods for assessing the effectiveness and impact of water use restrictions on customers.

As explained in Section 7.2 above, Bristol Water has committed to being 'permit ready' for the drought permit options which are put forward in the final drought plan, subject to confirmation through work being carried out for the WRMP that they are still required. This includes a review of the existing (2007) Environmental Monitoring Plan that is in place for the drought permit options contained in the 2018 Drought Plan which sets out the monitoring to be carried out to augment existing baseline environmental data and any monitoring that would need to be undertaken before, during and after any drought permit implementation in an actual drought. The EMP includes monitoring requirements in relation to hydrology, water quality, hydromorphology and aquatic ecology commensurate with the scale and magnitude of the potential adverse effects (as set out in this Environmental Report). Any risk to WFD and designated conservation sites would need to be assessed against WFD and/or Common Standards Monitoring Guidance, as applicable.

Similarly, relevant environmental baseline data would need to be collated in respect of the Honeyhurst Well option (abstraction effects on WFD status and pipeline construction effects) to help provide the context for monitoring before, during and after implementation of this option in an actual drought to confirm the predicted effects set out in this Environmental Report.



---

## 8 Quality Assurance

ODPM Guidance on SEA contains a Quality Assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in **Appendix H**, demonstrating how this Environmental Report meets the requirements.



Ricardo  
Energy & Environment

The Gemini Building  
Fermi Avenue  
Harwell  
Didcot  
Oxfordshire  
OX11 0QR  
United Kingdom

t: +44 (0)1235 753000  
e: [enquiry@ricardo.com](mailto:enquiry@ricardo.com)

[ee.ricardo.com](http://ee.ricardo.com)