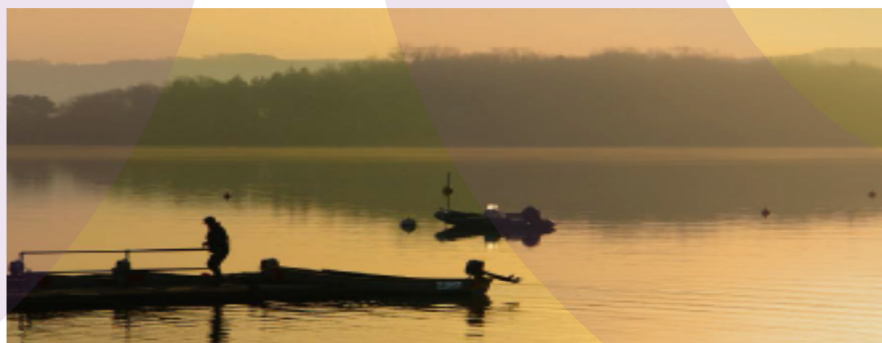
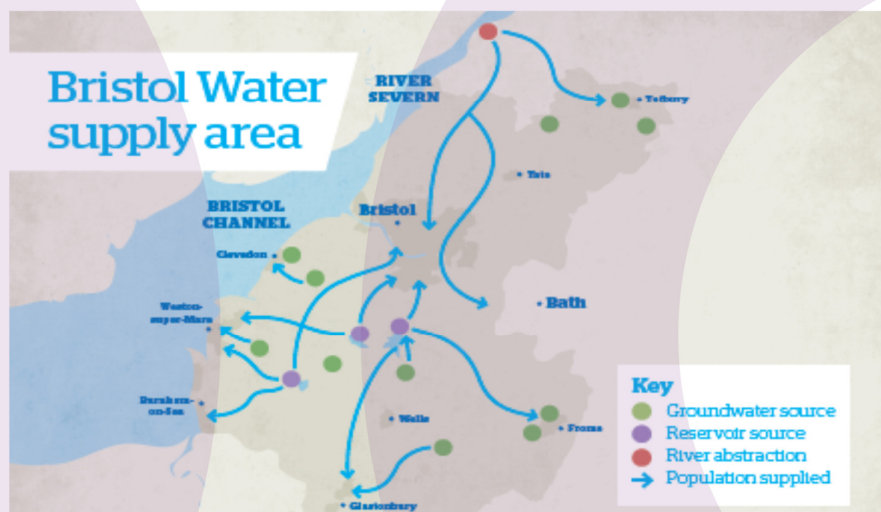


Strategic Environmental Assessment of the Final Water Resources Management Plan 2019

Post Adoption Statement

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FINAL**Report for**

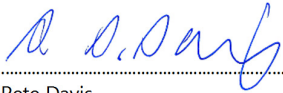
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Doc Ref. 38948r005i1Rv3

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Document revisions

No.	Details	Date
1	Draft	August 2019
2	Revised	August 2019
3	Final	August 2019

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1. Introduction

This report forms the Post Adoption Statement (PAS) to accompany the final version of Bristol Water's Water Resources Management Plan (WRMP). The report describes the way in which Bristol Water has taken environmental considerations and the views of consultees into account in the adopted WRMP and fulfils the plan and programme adoption requirements of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment and the Environmental Assessment of Plans and Programmes Regulations 2004 (SI 2004 No. 1633).

1.1 Bristol Water's Water Resources Management Plan

- 1.1.1 Bristol Water provides water supplies to 1.1 million people and all the associated businesses in an area of approximately 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.
- 1.1.2 Bristol Water relies on 68 water sources, including reservoirs, rivers, springs, wells and boreholes. About 88% of the water supply comprises surface waters while 12% comes from groundwater. Water resources within the Bristol Water supply area alone are not sufficient to meet customer demand for water and therefore approximately 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.
- 1.1.3 Along with all water companies in England and Wales, there is a statutory requirement for Bristol Water to prepare, maintain and publish a WRMP that sets out how the balance between water supply and demand, and security of supply, will be maintained over the coming 25 years in a way that is economically, socially and environmentally sustainable. These are reviewed on a rolling 5 year basis and Bristol Water is currently preparing its WRMP for the period 2020 to 2045. Once published, WRMP19 will replace the current WRMP14.
- 1.1.4 The WRMP presents management options by water resource zone (WRZ). WRZs are defined in the Water Resources Planning Guideline¹ as "*an area within which the abstraction and distribution of supply to meet demand is largely self-contained (with the exception of agreed bulk transfers)...Within a WRZ all parts of the supply system and demand centres (where water is needed) should be connected so that all customers in the WRZ should experience the same risk of supply failure and the same level of service for demand restrictions*". Bristol Water's supply area is operated as a single WRZ. Where the Supply Demand balance (SDB) identifies that the WRZ is in deficit over the lifetime of the plan, the WRMP will present management options to address the deficit and maintain the balance of supply and demand.
- 1.1.5 The process of management option development includes a review of as many potential solutions as possible (the 'unconstrained list' of options) to identify 'feasible' (constrained) options for each WRZ where deficits are predicted. These 'feasible' options are then reviewed to identify 'preferred options' to resolve any supply deficits in relation to financial, environmental and social costing.

¹ Environment Agency and Natural Resources Wales (2018) *Water Resources Planning Guideline: Interim Update*. Available at: <https://cdn.naturalresources.wales/media/686174/interim-wrpg-update-july18-final-changes-highlighted.pdf>

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- 1.1.6 The SDB for the Bristol Water supply area has identified a deficit over the lifetime of the plan. Following screening of the unconstrained options, 21 feasible options were identified for potential consideration to address the deficit. The types of feasible options considered in preparing WRMP19 were broadly categorised as follows:
- production and resource options;
 - customer demand options; and
 - distribution options.
- 1.1.7 Informed by the environmental, social and economic assessments and ongoing discussion with stakeholders, the list of feasible options was refined to identify the preferred options for the draft WRMP published in March 2018. The preferred options together with the scale of implementation and yield, as proposed in the draft WRMP were:
- Option R32: Resource reduction of bulk transfer agreement with Wessex Water (yield 11.4 MI/d);
 - Option D21: Active Leakage Control (yield 4.5 MI/d);
 - Option D22: Pressure Management (yield 2.1 MI/d); and
 - Option P20: Reduced leakage from raw water mains (yield 3.9-5.5 MI/d).
- 1.1.8 Following consultation on the draft WRMP and the responses from the regulators and consultees, further changes were made to the WRMP, including:
- reductions in leakage to ensure alignment with the Ofwat challenge of 15% reductions during AMP7 and then further leakage reductions in the longer term to 2035;
 - increasing the take up of water metering, from 66% by the start of 2020 to 87% by 2045;
 - updated assessment of the deployable output (reliable supply) of water sources in line with the new national methodology for drought resilience (that was issued after completion of the draft WRMP) leading to a 10 MI/d reduction to the deployable output (reliable supply);
 - agreeing a reduction in the future volume of water supplied to Wessex Water from 2025 to help maintain resilient water supplies in drought conditions;
 - increasing water efficiency to achieve a reduction in per capita consumption (PCC) from 141 litres/head/day in 2020 to 129 litres/head/day in 2045 and 110 litres/head/day in 2050;
 - further reductions in leakage from raw water systems and at water treatment works.
- 1.1.9 Applying the changes to the SDB, Bristol Water is now forecasting a small residual supply deficit of 0.2 MI/d at 2035 rising to 9.18 MI/d at 2045. Bristol Water will address this by the use of three preferred options.
- D21.1: Active Leakage Control (yield of 2.83 MI/d in 2024/25);
 - D21.2: Active Leakage Control (yield of an additional 0.5 MI/d in 2029/30 and an additional 1 MI/d by 2034/35);
 - P20: Reduced leakage from raw water mains (enhanced leakage detection / raw mains repairs/replacement) (yield of 5.5MI/d).
- 1.1.10 These three options provided a combined yield of 9.83 MI/d.

FINAL**Preparation of the Water Resource Management Plan**

- 1.1.11 Consistent with the Water Resources Planning Guideline², the development of the WRMP has included the completion of three key stages:
- the publication of a Draft WRMP for public consultation;
 - the publication of a Revised Draft WRMP and the publication of a Statement of Response describing the consultation on the Draft WRMP and how the company took into account the comments received in the preparation of a Revised Draft WRMP; and
 - the publication of a Final WRMP.
- 1.1.12 The Draft WRMP was published from 8th March until 31st May 2018. Representations on the Draft WRMP were received from a total of 9 organisations. Bristol Water received 265 individual responses through a customer engagement online questionnaire.
- 1.1.13 The Statement of Response and revised draft WRMP¹⁹ were submitted to the Secretary of State for Environment, Food and Rural Affairs in September 2018 to determine whether the plan could be published.
- 1.1.14 Following a review of the Statement of Response to the consultation and the changes made in the Revised Draft WRMP, Defra requested more information on the plan. Subsequently, Bristol Water received direction to publish the Final WRMP from the Secretary of State. Bristol Water has now published the Final WRMP. It is available on the Bristol Water website at: <https://www.bristolwater.co.uk/about-us/water-resources/>

Strategic Environmental Assessment and the Water Resources Management Plan

- 1.1.15 Strategic Environmental Assessment (SEA) is a statutory requirement³ for plans and programmes that could have significant environmental effects. The SEA process identifies, describes and evaluates potential effects; proposing where appropriate, mitigation and/or enhancement measures.
- 1.1.16 Bristol Water published the SEA Scoping Report for the WRMP for a consultation period of five weeks ending on 7th May 2017. Consultation responses were used to refine the proposed scope and approach to the SEA.
- 1.1.17 The Draft WRMP was then subject to SEA. This assessed the likely significant effects on the environment of the Draft WRMP including an assessment of all the feasible options and the preferred options. The findings of the assessments were presented in the Environmental Report that was published for consultation alongside the Draft WRMP in March 2018.
- 1.1.18 A revised Environmental Report was completed to accompany the Revised Draft WRMP.
- 1.1.19 This PAS have been published on Bristol Water's website at: <https://www.bristolwater.co.uk/about-us/water-resources/>

² Environment Agency and Natural Resources Wales (2018) *Water Resources Planning Guideline: Interim Update*. Available at: <https://cdn.naturalresources.wales/media/686174/interim-wrpg-update-july18-final-changes-highlighted.pdf>

³ Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive) and *Statutory Instrument 2004 No. 1633 – The Environmental Assessment of Plans and Programmes Regulations 2004*.

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1.2 Purpose of the Post Adoption Statement

1.2.1 Article 9 of the SEA Directive and regulation 16 (4) of the SEA Regulations requires that when a plan or programme is adopted (in this case, the WRMP), the consultation bodies, the public and any other Member States consulted on the Environmental Report are informed and the following specific information is made available:

- the plan as adopted;
- a statement summarising:
 - ▶ how environmental considerations have been integrated into the WRMP;
 - ▶ how the Environmental Report has been taken into account;
 - ▶ how opinions expressed in response to the consultation on the Draft WRMP and the Environmental Report have been taken into account;
 - ▶ the reasons for choosing the WRMP, as adopted, in the light of the other reasonable alternatives dealt with; and
 - ▶ the measures that are to be taken to monitor the significant environmental effects of the implementation of the WRMP.

1.2.2 The purpose of this Post Adoption Statement is to provide the specific information outlined under each of the points listed above and which is presented in the following sections of this statement.

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2. How environmental considerations have been integrated into the WRMP

2.1 Environmental considerations in the development of the WRMP

- 2.1.1 Environmental considerations have been integral to the development of Bristol Water's WRMP 2019. The plan has been prepared in accordance with (amongst others⁴) the Water Industry Act 1991⁵, as amended by the Water Act 2003⁶ and the Water Act 2014⁷ and the Water Resources Management Plan Regulations 2007. Its development has been informed by Government and regulator⁸ guidance, aligns with the UK Sustainable Development Strategy⁹, the 25 year environmental plan¹⁰ and the relevant River Basin Management Plans. Collectively, this legislation, policy and guidance supports the sustainable use of natural resources.
- 2.1.2 The subsections that follow set out in more detail how environmental considerations have been taken into account by Bristol Water during the following key stages of the plan preparation process:
- supply-demand forecasting;
 - options identification, appraisal and selection; and
 - consultation and engagement.

Supply-demand forecasting

- 2.1.3 All water companies in England and Wales are required to set out a baseline forecast of demand for water for a minimum of 25 years, assuming current demand policies. This must be compared against a baseline forecast of available water supply, including current resources and future planned supply schemes/policies in order to determine whether there is likely to be a deficit in any water resources zone (WRZ) over the planning horizon of the WRMP.
- 2.1.4 Bristol Water's WRMP14 set out a position whereby there was a supply demand deficit from 2018 onwards. This was driven by a number of assumptions, the most significant of which was the need for a large industrial demand from 2018 onwards; this large demand has been put on indefinite hold. The review and update of all of the components of the supply demand balance to support the WRMP19 shows that a supply deficit is no longer forecast until 2022/23, and the volume of this deficit is significantly less than previously forecast.
- 2.1.5 In calculating the baseline forecast of available water supply for the WRMP, Bristol Water has taken into account a range of environmental factors, which are summarised below.

⁴ The full suite of legislation is presented in section 2.2 'Regulatory Framework' of the Final WRMP

⁵ HM Government (1991) Water Resources Act 1991

⁶ HM Government (2003) Water Act 2003

⁷ HM Government (2014) Water Act 2014

⁸ Environment Agency and Natural Resources Wales (2018) *Water Resources Planning Guideline: Interim Update*. Available at: <https://cdn.naturalresources.wales/media/686174/interim-wrpg-update-july18-final-changes-highlighted.pdf>.

⁹ HM Government (2005) *UK Sustainable Development Strategy*. Available at <https://www.gov.uk/government/publications/securing-the-future-delivering-uk-sustainable-development-strategy>

¹⁰ HM Government (2018) *A Green Future: Our 25 Year Plan to Improve the Environment*. Available at: <https://www.gov.uk/government/publications/25-year-environment-plan>

FINAL**Sustainable Abstractions**

- 2.1.6 Reduction in abstraction from environmentally sensitive sites has the potential to significantly reduce the quantity of water that can be reliably abstracted from some water sources and result in the need for significant expenditure to enhance water supply capability and/or reduce demand for water. In this context, the environmental sensitivity of the area in which Bristol Water operates has been a key consideration in the development of the WRMP. There are 11 'Natura 2000' sites in the Bristol Water supply area, which include two Ramsar sites, six Special Areas of Conservation (SACs), and three Special Protection Areas (SPAs). The area has 7,725 hectares (ha) of land designated as SSSIs: these include the Chew Valley Lake, Cheddar Reservoir and Blagdon Lake SSSIs. The area also contains eight National Nature Reserves (NNRs) (Gordano Valley, Leigh Woods, Ebbor Gorge, Rodney Stoke, Ham Wall, Westhay Moor, Shapwick Heath and Huntspill).
- 2.1.7 Under the Habitats Directive (92/43/EEC) and implementing regulations¹¹, the Environment Agency (EA) is required to ensure that its 'permissions' (i.e. abstraction licences and discharge consents) and subsequently consented operations have no adverse effect on the 'integrity' of the SACs and SPAs that form part of the pan-European network of Natura 2000 sites. Whilst Bristol Water does not operate any abstractions which have been identified by the Environment Agency as being unsustainable, the company has for many years worked in partnership with Wessex Water to mitigate the impact of the unsustainable abstractions by Wessex Water in the Malmesbury area, close to Bristol Water's area of supply. As part of this scheme, since 1998, Bristol Water has operated a 10.1 Ml/d reduction in abstraction from the Shipton Moyne and Long Newnton sources to improve flow in the Tetbury Avon. Bristol Water has worked with the Environment Agency and Wessex Water to achieve additional reductions in abstraction of 1.5 Ml/d in the Malmesbury area for sustainability reasons. This river support programme and voluntary reduction in abstraction by Bristol Water helps reduce the negative impact of Wessex Water's abstraction from groundwater in the area.

Water Framework Directive

- 2.1.8 There are 220 surface water bodies in the management catchments (Bristol Avon and North Somerset Management Catchment and South and West Somerset Management Catchment) covered by Bristol Water supply area. Under the Water Framework Directive (WFD) (2000/60/EC), only 11% are currently classed as achieving Good Ecological Status (GES) although by 2021 it is predicted that a further 24% of the waterbodies will achieve GES. The groundwater body status underlying the Bristol Water supply area is generally good, except for the Bristol Triassic aquifer which is of poor chemical status despite having a good quantitative status.
- 2.1.9 Bristol Water has undertaken a separate WFD Assessment of the WRMP to ensure that the WRMP is compliant with the objectives of the WFD. This has included an assessment of existing abstractions, changes to abstractions (within licence limits) and proposed new abstractions (specifically, feasible (constrained) and preferred water resource management options, where relevant). The WFD assessment concluded that the feasible options were likely to have a minimal to minor level of impact on WFD water bodies. Five options were identified as requiring further assessment as they had a medium or a high level of impact; however as none of these options were selected as preferred options for the final WRMP, and following feedback from the EA, Bristol Water has confirmed that for AMP7 there are currently no abstraction sites identified that will cause an impact upon the waterbody status which could affect supply.

¹¹ HM Government (2017) The Conservation of Habitats and Species Regulations 2017

FINAL**Resilience**

- 2.1.10 National guidance¹² has emphasised the importance of assessing and improving resilience of the water supply systems and water resources. This has included determining resilience to droughts, and the severity of the drought that would require the imposition of severe restrictions to water supplies beyond the use of hosepipe and non-essential use bans.
- 2.1.11 To address this, in line with specific guidance¹³, the WRMP plans for both the worst drought on record (1933/1934) and droughts more severe than those on record, to ensure that water supply can continue without restrictions, even in a drought so severe that it might be seen only once every two hundred years.
- 2.1.12 In addition, to ensure customer supplies are secure and robust in the long term, Bristol Water has also taken into account the future effects of climate change in determining the supply demand balance in the WRZ by:
- estimating the most likely impact of climate change upon supply capability into the future (2080s) using a Tier 3 approach as set out in EA guidance;¹⁴
 - by looking at the uncertainty around the climate change driven projections used in model runs.
- 2.1.13 The assessments have indicated where additional interventions are required to improve zonal resilience to future environmental changes.

Options identification, appraisal and selection

- 2.1.14 As set out in Section 1, Bristol Water has identified a supply deficit over the lifetime of the plan. The identification, appraisal and selection of options to address the supply demand deficit has been informed by detailed consideration of their potential environmental effects. Options considered in preparing WRMP19 were broadly categorised as, production and resource, demand or distribution options.
- 2.1.15 The process of options identification included a review of as many potential solutions as possible (the 'unconstrained list' of options) to identify 'feasible' (constrained) water management options to address the predicted deficit. These 'feasible' options were then reviewed in relation to financial, environmental and social costing to identify 'preferred options' to resolve the supply deficits.
- 2.1.16 The approach involved a multi-stage, multi-criteria screening process that included consideration of the statutory SEA, HRA and WFD assessment processes, technical and operational feasibility, resilience considerations and evidence from customer research. The inclusion of the statutory environmental assessment processes helped to embed environmental considerations into the options assessment process from the outset.
- 2.1.17 The unconstrained options list was developed through several activities, including a review of options identified for previous WRMPs, the generation of new options ideas from workshops with Bristol Water operational and strategic planning staff and a review of regulatory and best practice guidance. These unconstrained options were reviewed and subject to a "coarse screening" to identify any over-riding constraints to option promotion, development and implementation. These included environmental risks such as risks to international and national designated conservation sites and possible effects on designated landscapes and cultural features.

¹² Environment Agency and Natural Resources Wales (2018) *Water Resources Planning Guideline: Interim Update*. Available at: <https://cdn.naturalresources.wales/media/686174/interim-wrpg-update-july18-final-changes-highlighted.pdf>

¹³ UKWIR (2016) *WRMP 2019 Methods – Risk Based Planning*. Report ref: 16/WR/02/11

¹⁴ Environment Agency (April 2017) *WRMP supplementary information: Estimating the impacts of climate change on water supply*

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- 2.1.18 Following the initial “coarse” screening exercise, a feasible list of options was identified. These were then subject to a “fine” screening process involving a wider and more detailed set of assessment criteria that built on the initial coarse screening criteria. The criteria included explicit linkages to the provisional findings of the statutory SEA, HRA and WFD assessment processes, ensuring integration of the statutory environmental assessment consistent to the stage of the screening process.
- 2.1.19 The findings of the fine screening process were used to determine those options to be carried forward to the final stages of the appraisal process. The draft findings were discussed with the Environment Agency in March 2017 and feedback taken into account in finalising the options carried forward for the final stages of the appraisal process.
- 2.1.20 In line with the WRMP guidance, Bristol Water additionally undertook an ecosystem services (ESS) assessment of the feasible and preferred options. It comprised a quantitative and qualitative assessment of:
- the ESS present within the zone of influence of each WRMP feasible supply option (baseline at 2017);
 - how the ESS present may change within the timeframe of the assessment (by 2050) in the absence of the WRMP option – the future baseline;
 - how the ESS may change after the implementation of the WRMP feasible supply option (in relation to the future baseline).
- 2.1.21 The approach identified the likely scale of the expected impacts (ensuring a proportionate level of effort) and that the relevant beneficiaries or dis-beneficiaries have been considered.
- 2.1.22 In addition, and consistent with the requirement set out in the Water Resources Management Plan (England) Direction 2017, Bristol Water calculated carbon emissions and carbon costs for each feasible option. This information was used within the SEA and environmental and social costing assessment undertaken of the feasible and preferred options.
- 2.1.23 Bristol Water then examined the options and combinations of options to develop optimised programmes to address the forecast supply deficit. Bristol Water’s preferred approach to maintaining the supply-demand balance is focused on optimising the use of existing water sources while continuing to drive down leakage and water consumption to achieve a more sustainable use of water resources. The net positive environmental outcomes of this selection reflects the successful integration of the different environmental considerations within the option identification, appraisal and selection process.

Consultation and engagement

- 2.1.24 Bristol Water has undertaken extensive stakeholder and customer engagement during the preparation of the WRMP. This has included ongoing engagement with the statutory SEA consultation bodies and in particular, Bristol Water has liaised closely with the EA to ensure that the WRMP complies with the requirements of the Habitats Directive and WFD.

2.2 Environmental considerations in the Strategic Environmental Assessment

- 2.2.1 To provide the context for the SEA, and in compliance with the SEA Directive and SEA Regulations, the relevant aspects of the current state of the environment and its evolution without the WRMP were considered at the outset of the SEA process, along with the environmental characteristics

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likely to be significantly affected by the plan. This information was contained in the SEA Scoping Report and subsequently updated as part of the Environmental Report.

- 2.2.2 The key environmental, social and economic issues identified in Bristol Water's operational area and subsequently reflected in the assessment of WRMP options are summarised in **Table 2.1**.

Table 2.1 Key economic, social and environmental issues relevant to the WRMP

SEA Topic	The key economic, social and environmental issues relevant to the WRMP
Biodiversity, flora and fauna	<ul style="list-style-type: none"> • The need to protect and enhance sites designated for nature conservation. • The need to protect and enhance non-designated sites. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors and to improve the resilience of habitats. • The need to continue to increase and improve the condition of priority habitats and habitats of priority species, and restore populations of these species and other specially protected species. • The need to avoid activities likely to cause irreversible damage to natural heritage. • 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. • The need to prevent the spread/introduction of invasive non-native species. • The need to recognise the importance of allowing wildlife to adapt to climate change.
Geology, land use and soils	<ul style="list-style-type: none"> • The need to maintain or improve the quality of soils/agricultural land. • The need to protect and enhance sites designated for their geological interest. • The need to maintain and enhance soil function and health. • The need to make use of Previously Developed Land (PDL), and to reduce the prevalence of derelict land. • The need to manage land more holistically at the catchment level, benefiting landowners and other stakeholders, the environment and sustainability of natural resources.
Water	<ul style="list-style-type: none"> • The need to further improve the quality of the region's river, estuarine and coastal waters taking into account WFD objectives. • The need to maintain the quantity and quality of groundwater resources taking into account Water Framework Directive (WFD) objectives. • The need to ensure the risk of flooding is not increased, and options for flood avoidance and resilience are investigated. • The need to improve the resilience, flexibility and sustainability of water resources in the region, 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.
Air Quality and climate	<ul style="list-style-type: none"> • The need to minimise emissions of pollutant gases and particulates and enhance air quality. • The need to reduce the need to travel and promote sustainable modes of transport. • The need to reduce greenhouse gas emissions arising from implementation of the WRMP. • The need to take into account, and where possible adapt to, the potential effects of climate change. • The need to increase environmental resilience to the effects of climate change.
Human Environment	<ul style="list-style-type: none"> • 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 region, particularly in urban areas and deprived areas. • The need to maintain resilient, reliable public water supplies. • 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.

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SEA Topic	The key economic, social and environmental issues relevant to the WRMP
	<ul style="list-style-type: none"> 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.
Material assets and resource use	<ul style="list-style-type: none"> The need to minimise the consumption of resources, including water and energy. The need to reduce the total amount of waste produced in the region, 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.
Archaeology and cultural heritage	<ul style="list-style-type: none"> 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.
Landscape and visual	<ul style="list-style-type: none"> 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.

2.2.3 The issues listed above were reflected in the objectives and guide questions that collectively comprised the framework used to assess the WRMP (see **Table 2.2**).

Table 2.2 Assessment framework used to assess the WRMP

Topic Area	SEA Objective	Guide Questions
Biodiversity	1. To protect and enhance biodiversity, key habitats and species, working within environmental capacities and limits.	<i>Will the option protect and enhance where possible the most important sites for nature conservation (e.g. internationally or nationally designated conservation sites such as SACs, SPAs, Ramsar and SSSIs)?</i>
		<i>Will the option protect and enhance non-designated sites and local biodiversity?</i>
		<i>Will the option provide opportunities for new habitat creation or restoration and link existing habitats as part of the development process?</i>
		<i>Will the option lead to a change in the ecological quality of habitats due to changes in groundwater/river water quality and/or quantity?</i>
		<i>Will the option protect, and enhance where appropriate, coastal and marine habitats and species?</i>
Geology, Land Use and Soils	2. To ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.	<i>Will the option prevent the spread/introduction of invasive non-native species?</i>
		<i>Will the option protect and enhance where appropriate, coastal and marine habitats and species?</i>
		<i>Will the option prevent the spread/introduction of invasive non-native species?</i>
		<i>Will the option prevent the spread/introduction of invasive non-native species?</i>
Geology, Land Use and Soils	2. To ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.	<i>Will additional land be required for the development or implementation of the option or will the option require below ground works leading to land sterilisation?</i>
		<i>Will the option utilise previously developed land?</i>
		<i>Will the option protect and enhance protected sites designated for their geological interest and wider geodiversity?</i>
		<i>Will the option minimise the loss of best and most versatile agricultural land?</i>
Geology, Land Use and Soils	2. To ensure the appropriate and efficient use of land and protect and enhance soil quality and geodiversity.	<i>Will the option minimise conflict with existing land use patterns?</i>
		<i>Will the option minimise conflict with existing land use patterns?</i>

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Topic Area	SEA Objective	Guide Questions
		<i>Will the option minimise land contamination?</i>
Water - Quantity	3. To protect and enhance surface and ground water levels and flows and ensure sustainable water resource management.	<i>Will the option minimise the demand for water resources?</i>
		<i>Will the option result in changes to river flows?</i>
		<i>Will the option result in changes to groundwater levels?</i>
Water - Quality	4. To protect and enhance the quality of surface and groundwater resources and the ecological status of water bodies.	<i>Will the option protect and improve surface, groundwater, estuarine and coastal water quality?</i>
		<i>Will the option prevent the deterioration of Water Framework Directive (WFD) waterbody status (or potential)?</i>
		<i>Will the option support the achievement of protected area objectives?</i>
		<i>Will the option support the achievement of environmental objectives set out in River Basin Management Plans?</i>
		<i>Will the option ensure a new activity or new physical modification does not prevent the future achievement of good status for a water body?</i>
Water – Flood Risk	5. To reduce the risk of flooding.	<i>Will the option have the potential to cause or exacerbate flooding in the catchment area now or in the future?</i>
		<i>Will the option have the potential to help alleviate flooding in the catchment area now or in the future?</i>
		<i>Will the option be at risk of flooding now or in the future?</i>
Climate Change	6. To limit the causes and potential consequences of climate change.	<i>Will the option reduce or minimise greenhouse gas emissions?</i>
		<i>Will the option have new infrastructure that is energy efficient or make use of renewable energy sources?</i>
		<i>Will the option reduce vulnerability to the effects of climate change by appropriate adaptation?</i>
Human Environment - Health	7. To ensure the protection and enhancement of human health.	<i>Will the option increase environmental resilience to the effects of climate change?</i>
		<i>Will the option ensure the continuity of a safe and secure drinking water supply?</i>
		<i>Will the option affect opportunities for recreation and physical activity?</i>
		<i>Will the option maintain surface water and bathing water quality within statutory standards?</i>
Human Environment - Social and Economic Well-Being	8. To maintain and enhance the economic and social well-being of the local community.	<i>Will the option adversely affect human health by resulting in increased nuisance and disruption (e.g. as a result of increased noise levels)?</i>
		<i>Will the option ensure sufficient infrastructure is in place for predicted population increases?</i>
		<i>Will the option ensure sufficient infrastructure is in place to sustain a seasonal influx of tourists?</i>
		<i>Will the option help to meet the employment needs of local people?</i>

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Topic Area	SEA Objective	Guide Questions
		<p><i>Will the option ensure that an affordable supply of water is maintained and vulnerable customers protected?</i></p> <p><i>Will the option improve access to local services and facilities (e.g. sport and recreation)?</i></p> <p><i>Will the option contribute to sustaining and growing the local and regional economy?</i></p> <p><i>Will the option avoid disruption through effects on the transport network?</i></p> <p><i>Will the option be resilient to future changes in resources (both financial and human)?</i></p>
Material Assets and Resource Use - Water Resources	9. To ensure the sustainable and efficient use of water resources.	<p><i>Will the option lead to reduced leakage from the supply network?</i></p> <p><i>Will the option improve efficiency in water consumption?</i></p>
Material Assets and Resource Use – Waste and Resource Use	10. To promote the efficient use of resources.	<p><i>Will the option seek to minimise the demand for raw materials?</i></p> <p><i>Will the option promote the re-use and recycling of waste materials and reduce the proportion of waste sent to landfill?</i></p> <p><i>Will the option encourage the use of sustainable design and materials?</i></p> <p><i>Will the option reduce or minimise energy use?</i></p>
Cultural Heritage	11. To conserve and enhance cultural and historic assets.	<p><i>Will the option conserve or enhance the historic environment, including heritage assets such as historic buildings, conservation areas, features, places and spaces, and their settings</i></p> <p><i>Will the option avoid or minimise damage to archaeologically important sites?</i></p> <p><i>Will the option avoid damage to important wetland areas with potential for paleoenvironmental deposits?</i></p> <p><i>Will the option affect public access to, or enjoyment of, features of cultural heritage?</i></p>
Landscape	12. To conserve and enhance landscape character.	<p><i>Will the option avoid adverse effects on, and enhance where possible, protected/designated landscapes (including woodlands) such as National Parks or AONBs?</i></p> <p><i>Will the option protect and enhance landscape character, townscape and seascape?</i></p> <p><i>Will the option affect public access to existing landscape features?</i></p> <p><i>Will the option minimise adverse visual impacts?</i></p>

2.2.4 The SEA has used a three stage process to assess the effects of the draft and revised draft WRMP. The first stage is a high level assessment of all feasible (constrained) water management options (including supply side, demand side and leakage options) against the 12 SEA assessment objectives outlined in **Table 2.2** with the findings presented in a summary matrix. The second stage is a more detailed assessment (where information permits) of the preferred options identified in the draft WRMP. For this stage, the potential effects (positive, negative or neutral) and the significance of the effects of each of the preferred options against each of the SEA objectives has been recorded,

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along with commentary setting out the reasons for the assessment results, any assumptions and uncertainties and, where appropriate, potential mitigation measures. The third stage is an assessment of the revised preferred options that, in combination, form Bristol Water's final proposed programme of options using the same assessment matrix as for stage two. The assessments considered:

- the nature of the potential effect (what is expected to happen);
- the timing and duration of the potential effect (e.g. short, medium or long term);
- the geographic scale of the potential effect (e.g. local, regional, national);
- the location of the potential effect (e.g. whether it affects rural or urban communities, or those in particular parts of the supply area);
- the potential effect on vulnerable communities or sensitive habitats;
- the reasons for whether the effect is considered significant;
- the reasons for any uncertainty, where this is identified; and
- the potential to avoid, minimise, reduce, mitigate or compensate for the identified effect(s) with evidence (where available).

2.2.5

An important part of the SEA process is the assessment of reasonable alternatives. For the purposes of the SEA of the WRMP, the feasible options have been assessed as reasonable alternatives to the preferred options that comprise the draft WRMP and revised draft WRMP.

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3. How the findings of the Environmental Report have been taken into account

3.1 Overview

3.1.1 The SEA Environmental Report and WRMP have been developed in tandem. **Table 3.1** details key stages of the SEA and its relationship with the development of the WRMP.

Table 3.1 Key stages in the development of the Environmental Report and its relationship with the WRMP

Strategic Environmental Assessment	WRMP	Relationship
Scoping		
<p>The scoping stage of the SEA identified other relevant plans, programmes and environmental protection objectives which could be affected by, or which could affect, the WRMP.</p> <p>The scoping stage also characterised the relevant aspects of the current state of the environment and its evolution without the WRMP.</p>	<p>The WRMP used the plans and programmes identified to ensure that it was fully in compliance with local, national and international policy and legislation.</p> <p>Baseline information supported early optioneering.</p>	<p>The links between the other relevant plans, programmes, policies and strategies that were applicable to the WRMP and its Environmental Report were outlined. These included plans and programmes at an international, European or national level covering a variety of topics.</p> <p>Information on environmental issues helped determine constraints on the suitability of certain options.</p> <p>The SEA objectives ensured that the full range of social, economic and environmental issues was considered in the WRMP's development.</p>
Assessment		
<p>Testing the plan or programme objectives against the SEA objectives</p>	<p>The Environment Report and the WRMP were developed together.</p>	<p>The Environmental Report and option appraisals were jointly used to derive the WRMP.</p>
	<p>The WRMP considered unconstrained water management options within the deficit zones. The unconstrained list of water management options was screened using a set of criteria resulting in a shortlist of feasible options that were taken forward for further assessment in the deficit zones.</p>	<p>The SEA objectives were used to help inform and refine option screening criteria and initial commentary was provided in respect of the potential environmental effects of the feasible options.</p>
<p>The SEA assessed 21 feasible options compromising production and resource options, customer demand options; and distribution options for potential consideration to address the deficit.</p>	<p>The capital, operating and social and environmental costs of the feasible options were assessed and their environmental effects, taking into account the findings of the SEA, WFD Assessment, HRA and E&S costings, were considered.</p>	<p>The feasible options were subject to a range of assessments including SEA as well as assessment of environmental and social costs and benefits. The findings of the SEA helped to identify the preferred options.</p>

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Strategic Environmental Assessment	WRMP	Relationship
	Along with ongoing discussion with stakeholders, this information was used to identify potential preferred options. A total of three preferred options were identified to address the supply demand deficit.	
The SEA included an enhanced assessment of the preferred options.	Consultation was undertaken on the WRMP to incorporate the opinions of stakeholders and customers on economic, customer and financial aspects of the WRMP. The short- and long-term risks of each option were also taken into account.	The findings of the detailed assessment supported the selection of the preferred options and rejection of alternatives (the feasible options). The findings of the detailed assessment included mitigation measures that were incorporated into the WRMP.
Reporting		
The key findings of the Environmental Report are presented along with Bristol Water's response in Table 3.2 below. The extent to which the findings have informed the final WRMP is detailed in Section 5 of this Post Adoption Statement.		
Consultation		
Responses to consultation on the Environmental Report are presented along with the Bristol Water's responses in Section 4 and Appendix B . The extent to which the consultation has informed the final WRMP is detailed in Section 5 of this Post Adoption Statement.		
Monitoring		
Proposals for monitoring identified in Section 6 of this Post Adoption Statement will be implemented by Bristol Water.		

3.2 Key findings of the SEA

- 3.2.1 As demonstrated in **Table 3.1** above, the SEA process has played an important role in the development of the WRMP. The key findings of the Environmental Report are summarised in **Table 3.2** together with Bristol Water's response.

Table 3.2 Key findings of the Environmental Report

No.	Key Environmental Report Findings	Response
1	<p>Construction of the revised preferred options would result in neutral effects against the majority of the objectives.</p> <p>Option D21 (the leakage detection find and repair scheme) is assessed as having negative effects on Objectives 6 (climate change), 8 (economic and social wellbeing) and 10 (waste and resource use).</p> <p>Option P20 (reduced leakage from raw water mains) is assessed as having significant negative effects against</p>	<p>Mitigation will be considered during the planning phases of each of the individual schemes. Best practice procedures will be followed for all construction works and opportunities will be sought to go above and beyond standards set down in guidance. For example, Bristol Water aims to achieve net gain in biodiversity benefits as measured under its innovative Biodiversity Index performance commitment. Planning of street works will be undertaken to minimise disruption. To maximise benefits to the local economy Bristol Water will try to</p>

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No.	Key Environmental Report Findings	Response
	<p>climate change (due to embodied carbon emissions associated with new mains and emissions from plant and vehicle movements repair and replace leaking mains), and waste and resource use (due to increase in resource use and construction waste along with fuel usage for vehicles and plant), although some uncertainty remains due to uncertainties over the location, duration and scale of activities (which will be responsive to the leaks identified).</p> <p>Minor negative effects are assessed against human health (due to impacts on local air quality and generation of noise/vibration disturbance by vehicle movements and the operation of plant) and landscape (due to potential for localised landscape and visual effects). Mixed minor positive and minor negative effects are assessed against economic and social wellbeing as the option would generate positive effects such as jobs creation and supply chain benefits but would also generate negative effects from potential for localised disruption to traffic</p>	<p>hire local contractors where possible. Where significant raw materials are required for options we will try to use recycled and locally sourced materials. Wastes will be recycled/reused where appropriate.</p> <p>Bristol Water has recently agreed a new network maintenance contract. Negotiations for the contract have required contractors to demonstrate in detail how they will minimise environmental and social impacts, and these criteria are central to Bristol Water's commitment to ensuring local community and environmental resilience.</p>
2	<p>The operation of the revised preferred options are assessed as having neutral or positive effects against all objectives during operation.</p> <p>Minor positive effects were identified for Objectives 3 (water quantity), 6 (climate change), 7 (human health), 8 (economic and social wellbeing), 9 (water resources) and 10 (waste and resource use). This is due to savings made by leakage reduction (Objectives 3 and 9), a reduction in annual greenhouse gas emissions (Objective 6), the greater resilience (Objective 7), ensuring a continual supply of clean drinking water (Objective 8), support economic growth in the area (Objective 8) and energy savings (Objective 10).</p> <p>The uncertainty against Objective 6 reflects the uncertainty associated with the operation of P20, and the extent to which the option would result in a decrease in demand for water abstraction and subsequent treatment with the commensurate reduction in energy demand and greenhouse gas emissions.</p>	<p>The fact that the preferred options have only neutral or beneficial effects is partly a result of the successful integration of environmental assessment outcomes into the WRMP development process.</p> <p>Bristol Water will seek to enhance beneficial effects of the preferred options where possible, for example through mechanisms such as the Biodiversity Index performance commitment which seeks to maximise biodiversity benefit on Bristol Water sites. Bristol Water will support economic growth in the area through continuing to hire local contractors where possible, and will continue to explore innovative approaches to energy management, noting our recent installation of a gas generator at our Purton WTW.</p>
3	<p>The construction and operational effects of the revised preferred options represent the balance that has been struck between the negative effects associated with the construction phase and the resulting significant positive effects from their subsequent operation. It is worth noting that the identified cumulative effects of construction maybe overly cautious as the effects are actually spread over the plan period 2020 – 2045 (as different options are implemented through the lifetime of the Plan) with largely short-term effects occurring as each option is implemented.</p>	<p>Through implementation of the WRMP Bristol Water will strive to use the most up to date approaches to mitigate negative impacts and to enhance beneficial effects for each individual scheme, noting that there will be technological advances over the 25 year lifetime of the plan.</p>
4	<p>In some cases, there is an opportunity to reduce some of the potential negative effects. The detail of this mitigation needs to be considered during the planning</p>	<p>In designing mitigation for individual schemes, for example to alleviate impacts on heritage assets, Bristol Water will consult and work with the relevant local authorities.</p>

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No.	Key Environmental Report Findings	Response
	<p>phases of each of the individual component schemes within the preferred options.</p> <p>Specific mitigation measures identified include:</p> <ul style="list-style-type: none">• Depending on the location of the leakage repair works appropriate mitigation measures would be adopted during construction to manage the risk of flooding and minimise any potential impacts on sites important to biodiversity, heritage assets and designated landscape sites.• Depending on the location of the trunk mains replacement and repair works appropriate mitigation measures would be adopted during construction to manage the risk of flooding and minimise any potential impacts on sites important to biodiversity, heritage assets and designated landscape sites.	<p>Repair works will often be reactive in nature. Bristol Water will ensure that any impacts associated with repair works, such as silt runoff from repair works are mitigated effectively.</p>

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4. How the opinions expressed in response to the consultation have been taken into account in preparing the Final Plan

4.1 Overview

4.1.1 Consultation has been an integral part of the SEA of Bristol Water's WRMP. This has included the following main activities:

- consultation with the statutory SEA bodies on the scope of the SEA; and
- formal public consultation on the Environmental Report containing the SEA of the Draft WRMP.

4.1.2 Consultation on the WMRP has included:

- Ongoing discussion with the Bristol Water Customer Challenge Panel, who help to direct Bristol Water in both engaging with customers and to challenge the robustness of the planning processes and responses to customer preferences. It includes a number of stakeholders who work within the water sector, such as the EA and Consumer Council for Water, and those who are independent such as Bath University and University of the West of England.
- Customer research including customer surveys, qualitative customer research (such as focus groups, interviews, and deliberative engagement events), ongoing customer insight data (such as that captured from inbound customer contacts, complaint data, and satisfaction cards) and acceptability research and testing. Some of the customer engagement was designed to inform particular decisions – for example deliberative events on resilience and a stated preference specifically focused on water resource management options.
- Pre-consultation commencing in 2017 with regulators, Government, neighbouring companies and key stakeholders such as the Consumer Council for Water, the EA and Ofwat to ask those organisations what they expected from the WRMP and to highlight any issues that emerged during the previous planning period.
- Formal consultation on the Draft WRMP (alongside which the SEA Environmental Report was published).
- Publication of Statement of Response, outlining how the comments received on the Draft WRMP have been taken into account in the development of the Final WRMP.

4.1.3 A summary of the outcomes of the consultation on the SEA and Draft WRMP are provided in the sections that follow.

4.2 SEA consultation

SEA scoping consultation

4.2.1 Bristol Water published the SEA Scoping Report for the WRMP for a consultation period of five weeks ending on 7th May 2017. Three responses were received to the consultation (from the Environment Agency, Natural England and Cadw). The comments received from these organisations were shown in Appendix C of the Environmental Report containing the SEA of the draft WRMP (see <https://www.bristolwater.co.uk/about-us/water-resources/>). The responses

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resulted in amendments to the baseline information and assessment framework that has been used to assess the options.

4.2.2 Responses broadly welcomed the proposed scope of the SEA, with comments providing:

- Suggestions for additional plans and programmes and baseline information. These were largely accepted and included in the updated contextual information presented in Sections 2 and 3 of the Environmental Report.
- Suggested amendments to the SEA Objectives and guide questions that comprise the SEA framework. These were also largely accepted and included, for example:
 - ▶ separating the SEA water quality and water quantity objectives;
 - ▶ providing further information on how the 'Uncertain' category is assessed; and
 - ▶ adding information on how zones of vulnerability are determined around designated sites for the SEA Objective 1 (Biodiversity).

Public consultation on the Environmental Report

4.2.3 The Environmental Report documented the findings of the assessment of feasible options, the preferred options and alternatives, outlining where any likely significant effects were identified and proposing, where appropriate, mitigation measures. This too was subject to consultation alongside the Draft WRMP for 12 weeks from 8th March and 31st May 2018.

4.2.4 The Environmental Report indicated that Bristol Water welcomed, in particular, views on:

- Whether the Environmental Report had correctly identified and described the likely significant effects of the Draft WRMP?
- Whether there are other likely significant environmental effects that should have been identified that would have affected the choice of preferred option included in the Draft WRMP
- Whether the proposed arrangements for monitoring the significant effects of the implementation of the WRMP were agreed with?

4.2.5 Responses were received from two organisations, the EA and Natural England. Details of the comments and how they have been addressed are set out in **Appendix B** of this PAS.

4.3 Consultation on the Draft WRMP

4.3.1 The draft WRMP was issued for public consultation for 12 weeks from 8th March and 31st May 2018.

4.3.2 During the consultation process Bristol Water:

- contacted over 100 consultees directly;
- contacted all relevant MPs and MEPs;
- publicised the Plan via Bristol Water's Twitter, Facebook and Instagram feeds on the Bristol Water's intranet and through communications with Bristol Water's Non-Household Retail Customers;
- utilised Bristol Water's 'Let Us Know' customer online panel questionnaire to gather feedback from customers on the draft WRMP; and

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- issued press releases to local media outlets and secured publication of an article in a newspaper local to the P10R area to raise the local awareness that the P10R Reservoir scheme that had been proposed in the Final WRMP14 was no longer being proposed.
- 4.3.3 Through the customer engagement online questionnaire, Bristol Water received 265 individual responses. Bristol Water received responses from 9 organisations (and the Bristol Water Challenge Panel). The organisation and the sections of the draft WRMP that they requested changes is summarised in **Table 4.1**.

Table 4.1 Key consultees and comments on the draft WRMP

Consultee	Section and Subject of change
Ofwat	Chapter 3: Engagement with customers, stakeholders and regulators Chapter 6: Water Supply Chapter 7: Water Demand Forecast Chapter 8: Baseline metering, leakage control and water efficiency Chapter 9: Sustainable abstraction Chapter 10: Climate Change Chapter 13: Options Appraisal Chapter 14: Environmental Appraisal Chapter 15: Programme Appraisal Chapter 16: Final Water Resources and Demand Strategy Appendix C: Research Methodologies and Outputs Relevant to the WRMP Appendix H: Options Appraisal
Environment Agency	Chapter 3: Engagement with customers, stakeholders and regulators Chapter 4: Background information Chapter 6: Water Supply Chapter 7: Water Demand Forecast Chapter 8: Baseline metering, leakage control and water efficiency Chapter 10: Climate Change Chapter 13: Options Appraisal Chapter 14: Environmental Appraisal Chapter 15: Programme Appraisal Chapter 16: Final Water Resources and Demand Strategy Chapter 17: Testing the WRMP Appendix E: SEA Environmental report Appendix F: HRA report
North Somerset Levels Internal Drainage Board	Chapter 9: Sustainable abstraction
Canal and Rivers Trust	Chapter 6: Water Supply Chapter 13: Options Appraisal Chapter 14: Environmental Appraisal
Historic England	No change required
National Farmers Union	Chapter 6: Water Supply Chapter 9: Sustainable abstraction Chapter 18: Future developments
Somerset Wildlife Trust	No change required
Waterwise	Chapter 8: Baseline metering, leakage control and water efficiency Chapter 9: Sustainable abstraction
Bristol Water Challenge Panel	Non-technical summary Chapter 4: Background information Chapter 8: Baseline metering, leakage control and water efficiency Appendix A: Atkins Assurance Report

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Consultee	Section and Subject of change
Wessex Water	Chapter 13: Options Appraisal

- 4.3.4 A Statement of Response to the consultation was published along with a Revised Draft WRMP in March 2019 (see <https://www.bristolwater.co.uk/about-us/water-resources/>).
- 4.3.5 Bristol Water considered the consultation responses received on the draft WRMP19 and updated the plan in light of the comments received. Several changes were made to the plan reflecting feedback from the public consultation, final decisions reached for our Business Plan submission and national water resource policy developments during 2018.
- 4.3.6 Following a review of the Statement of Response to the consultation and the changes made in the Revised Draft WRMP, on the 23rd July 2019 the Secretary of State for the Environment, Food and Rural Affairs gave Bristol Water direction to publish the Final WRMP.

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5. The reasons for choosing the WRMP as adopted, in light of the other reasonable alternatives dealt with

5.1 Reasons for the selection of the final WRMP

- 5.1.1 Bristol Water chose the final WRMP options using a standard industry method that includes consideration of technical feasibility, financial costs and benefits, and quantified impacts on the environment and community, taking into account the findings of the SEA, WFD and HRA as well as input from key stakeholders.
- 5.1.2 Bristol Water's approach for WRMP19 to maintaining the supply-demand balance is focused on optimising the use of existing water sources while continuing to drive down leakage and water consumption to achieve a more sustainable use of water resources. This accords very well with the consultation feedback on the draft WRMP19 and reflects strong customer support for this approach as evidenced by the WRMP19 customer engagement activity. In particular, there was strong feedback from customers, regulators and stakeholders that Bristol Water should be more ambitious on the plans to reduce leakage and water consumption.
- 5.1.3 In response, Bristol Water now plan to deliver a 15% reduction in leakage by the end of 2025 (to 36.5 MI/day) and to further reduce leakage in the longer term to 35.0 MI/day by 2035. The revised leakage reduction programme meets Ofwat's challenge to water companies on leakage and aligns with the policy recommendations set out in the National Infrastructure Commission Report on future water infrastructure needs¹⁵.
- 5.1.4 Bristol Water has also strengthened the commitment to reduce water consumption over the next 25 years. This includes increased household metering allied to further water efficiency activities to work towards our long-term aspiration of reducing average per capita consumption to 110 litres/person/day by 2050. Bristol Water plan to increase household metering from 66% of properties in 2020 to 87% by 2045. Together with additional water efficiency actions, it is forecast that average per capita consumption will reduce from 141.6 to 129.4 litres/person/day between 2020 and 2045.
- 5.1.5 This leaves a 15% gap to the 110 litre/head/day aspirational target for 2050. Closing this gap will require collaborative working with other water companies and local authorities as well as action by government over the coming years to:
- influence customer consumption behaviour to become more water efficient;
 - modify government policy to better support water efficiency actions, such as mandatory water labelling, more water efficiency standards for water using appliances and enhanced water efficiency requirements for new homes;
 - incentivise manufacturers and innovators to reduce water consumption rates for household and commercial water using appliances.
- 5.1.6 Bristol Water has already instigated the creation of the Resource West partnership with Bristol City Council, University of West of England (UWE) and other organisations to enhance the promotion of

¹⁵ NIC (2018) *Preparing for a drier future: England's water infrastructure needs*. Available at: <https://www.nic.org.uk/wp-content/uploads/NIC-Preparing-for-a-Drier-Future-26-April-2018.pdf>

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water efficiency in our supply area, and we will also work with neighbouring water companies through the West Country Water Resources group on water efficiency promotion.

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6. The measures decided concerning monitoring

- 6.1.1 The SEA Directive requires the significant environmental effects of implementing a plan to be monitored. Monitoring the effects of the WRMP can help to answer questions such as:
- Were the SEA predictions of effects accurate?
 - Is the WRMP contributing to the achievement of the SEA objectives?
 - Are mitigation measures performing as well as expected?
 - Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?
- 6.1.2 Bristol Water expect to monitor the effects of the WRMP alongside the other impacts of their operations, and as such, are likely to rely on existing sources of information that are collected either by Bristol Water or by other relevant organisations such as the Environment Agency or Natural England.
- 6.1.3 Consistent with the proposals of the Environmental Report, potential effects against all the SEA objectives have been included in the monitoring framework, which is set out in **Table 6.1**. Bristol Water will take a broad view of the findings of their ongoing monitoring processes to identify whether the WRMP has any significant unforeseen effects. Where these are identified, Bristol Water may be required to put in place specific monitoring arrangements and will consider how best to mitigate or avoid the adverse consequences.

Table 6.1 Measures for monitoring effects

Objective	Indicator	Source of Information	Commentary
1. To protect and enhance biodiversity, key habitats and species, working within environmental capacities and limits.	Condition of specific protected sites (e.g. SACs and SPAs)	NE	Open communication between NE and Bristol Water results in up-to-date information and identification of any potential issues.
	Condition of SSSIs on water industry land holdings	Bristol Water	Condition assessment of designated land on Bristol Waters landholdings, both area and condition may change.
	Biological monitoring (macroinvertebrates, macrophytes, fisheries, Bird surveys)	EA, Bristol Water, Angling clubs, British Trust for Ornithology	Using these data sets and comparing them against other monitored information such as levels and flows will assist in identifying whether there are any adverse effects and if mitigation measures are performing as well as expected.
	Increase in biodiversity (e.g. increase in diversity of species by planting, seeding and trans-locating plants)	Bristol Water Annual Performance Report Performance Commitment H3 (Biodiversity Index)	Bristol Water has an on-going programme of improvements in biodiversity at a number of their sites – measured by means of the Biodiversity Index
2. To ensure the appropriate and efficient use of land and protect and	Number/ floorspace of water infrastructure built on previously developed land	Bristol Water	Bristol Water could record the number and floorspace of new buildings that are built on previously developed land.

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Objective	Indicator	Source of Information	Commentary
enhance soil quality and geodiversity.			
3. To protect and enhance surface and ground water levels and flows and ensure sustainable water resource management.	River flow and level characteristics	Bristol Water, EA	Monitoring can be compared to historic records.
	River flows, river levels, lake and reservoir levels.	Bristol Water, EA	At sensitive sites previous studies should be used to inform monitoring and assessment. For example RoC documentation, WFD Post Implementation Monitoring data, and any Drought Permit (DP) Environmental Assessments and associated environmental monitoring plans.
	Groundwater levels and recharge characteristics	Bristol Water, EA	At sensitive sites previous studies should be used to inform monitoring and assessment. For example RoC, WFD Post Implementation Monitoring data, documentation and any Drought Permit (DP) Environmental Assessments and associated environmental monitoring plans.
	Leakage	Bristol Water Annual Performance Report Performance Commitment F1	Bristol Water reports these data to Ofwat and the EA as part of the annual returns process.
	Water saved through demand management/ water efficiency measures	Bristol Water	Bristol Water reports these data to Ofwat and the EA as part of the annual returns process.
4. To protect and enhance the quality of surface and groundwater resources and the ecological status of water bodies.	Water quality of surface waters.	Bristol Water, EA	At sensitive sites previous studies should be used to inform monitoring and assessment. For example RoC documentation, WFD Post Implementation Monitoring data, and any Drought Permit (DP) Environmental Assessments and associated environmental monitoring plans.
	Abstracted groundwater quality	Bristol Water, EA	At sensitive sites previous studies should be used to inform monitoring and assessment. For example RoC documentation, WFD Post Implementation Monitoring data, and any Drought Permit (DP) Environmental Assessments and associated environmental monitoring plans.
	Negative water quality consumer contacts	Bristol Water Annual Performance Report Performance Commitment E1	Bristol Water record the total number of consumer contacts (telephone, letter and email) about the appearance, taste and odour of the water for the previous calendar year.

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Objective	Indicator	Source of Information	Commentary
5. To reduce the risk of flooding.	Number of properties that experience flooding as a result of burst in the water supply distribution network.	Bristol Water	Bristol Water could record the number of properties that experience flooding as a result of bursts on the water supply distribution network.
6. To limit the causes and potential consequences of climate change.	Quantity of greenhouse gas emissions as kgCO ₂ e/person. Energy use used in the operational phase of water treatment and supply.	Bristol Water Annual Performance Report Performance Commitment H1	Bristol Water can use company data, and guidance from the UKWIR greenhouse gas workbook and Defra conversion factors to derive this information
	Renewable energy generated; renewable energy purchased.	Bristol Water	
7. To ensure the protection and enhancement of human health.	Compliance with drinking water standards at customers' taps (%).	Bristol Water – drinking water quality report	Bristol Water report these data to the Drinking Water Inspectorate.
	Compliance with water quality standards under the EC Bathing Waters Directive.	EA	The EA monitors the compliance of bathing waters and reports this annually.
	Number of Bristol Water sites with public access which provide sporting, recreational and leisure resources and number of visits per year.	Bristol Water	Bristol Water hold information on the number of annual visitors to sites where specific visitor facilities are provided (e.g. Chew Valley Lake Visitor Centre)
8. To maintain and enhance the economic and social well-being of the local community.	Population and projected population change over time	Bristol Water, ONS	Bristol Water report these data to the EA as part of the annual return process and to Ofwat as part of the Strategic Business Plan.
	Percentage of customers in water poverty	Bristol Water Annual Performance Report Performance Commitment I1	Bristol Water identifies the proportion of customers who pay more than 2% of their disposable income on water charges.
	Population in centres >25,000 at risk from asset failure	Bristol Water Annual Performance Report Performance Commitment B1	This measures the total number of consumers in areas of population of greater than 25,000 who are at risk of interruption to their water supply in the event that a critical asset such as a treatment works is unable to operate.
9. To ensure the sustainable and efficient use of water resources.	Chemicals Use in Water Supply	Bristol Water (services data)	Information on chemical use should be held in accounts.
10. To promote the efficient use of resources.	Amount of primary and recycled aggregates used.	Bristol Water (contractors/consultants)	Information on aggregate use and recycling should be held by Construction managers and accounts (contractors / consultants accounts, waste or procurement records)
11. To conserve and enhance cultural and historic assets.	Loss / damage or discovery / protection of cultural, historic and industrial heritage features.	Bristol Water, English Heritage	English Heritage monitor the condition of all statutorily protected monuments.

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Objective	Indicator	Source of Information	Commentary
12. To conserve and enhance landscape character.	Loss or damage to landscape character and features of designated sites.	Bristol Water	Bristol Water could record the number and floorspace of new buildings that are built on previously developed land.

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Appendix A SEA Compliance

Table A.1 details the SEA Regulations' requirements of the Post Adoption Procedures and indicates where relevant information required can be found in this report.

Table A.1 Compliance of this Report with the Requirements of the SEA Regulations

SEA Regulations Requirement	Location in the Post Adoption Statement (where appropriate)
Information as to adoption of plan or programme (SEA regulation 16)	
<p>(1) As soon as reasonably practicable after the adoption of a plan or programme for which an environmental assessment has been carried out under these Regulations, the responsible authority shall -</p> <p>(a) make a copy of the plan or programme and its accompanying environmental report available at its principal office for inspection by the public at all reasonable times and free of charge; and</p> <p>(b) take such steps as it considers appropriate to bring to the attention of the public</p> <p style="padding-left: 40px;">(i) the title of the plan or programme;</p> <p style="padding-left: 40px;">(ii) the date on which it was adopted;</p> <p style="padding-left: 40px;">(iii) the address (which may include a website) at which a copy of it and of its accompanying environmental report, and of a statement containing the particulars specified in paragraph (4), may be viewed or from which a copy may be obtained;</p> <p style="padding-left: 40px;">(iv) the times at which inspection may be made; and</p> <p style="padding-left: 40px;">(v) that inspection may be made free of charge.</p>	<p>A copy of the WRMP and accompanying reports and documentation is available at: https://www.bristolwater.co.uk/about-us/water-resources/</p> <p>A paper copy of the WRMP, Environmental Report and this Post Adoption Statement are available for public viewing at: Bristol Water plc Bridgwater Road, Bristol BS13 7AT</p> <p>The office is open from 9am until 5pm Monday to Friday.</p>
<p>(2) As soon as reasonably practicable after the adoption of a plan or programme -</p> <p>(a) the responsible authority shall inform—</p> <p style="padding-left: 40px;">(i) the consultation bodies;</p> <p style="padding-left: 40px;">(ii) the persons who, in relation to the plan or programme, were public consultees for the purposes of regulation 13; and</p> <p style="padding-left: 40px;">(iii) where the responsible authority is not the Secretary of State, the Secretary of State;</p> <p>and</p> <p>(b) the Secretary of State shall inform the Member State with which consultations in relation to the matters referred to in paragraph 3.</p>	<p>A copy of the WRMP and accompanying reports and documentation is available at: https://www.bristolwater.co.uk/about-us/water-resources/</p> <p>A copy of the SEA Environmental Report is available at: https://www.bristolwater.co.uk/about-us/water-resources/</p> <p>This Post Adoption Statement addresses (iii) and contains particulars specified in paragraph (4) as outlined below.</p>
(3) The matters are -	

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SEA Regulations Requirement	Location in the Post Adoption Statement (where appropriate)
<p>(a) that the plan or programme has been adopted;</p> <p>(b) the date on which it was adopted; and</p> <p>(c) the address (which may include a website) at which a copy of—</p> <ul style="list-style-type: none"> (i) the plan or programme, as adopted, (ii) its accompanying environmental report, and (iii) a statement containing the particulars specified in paragraph (4), <p>may be viewed, or from which a copy may be obtained.</p>	
<p>(4) The particulars referred to in paragraphs (1)(b)(iii) and (3)(c)(iii) are -</p>	
<p>(a) how environmental considerations have been integrated into the plan or programme;</p>	Section 2
<p>(b) how the environmental report has been taken into account;</p>	Section 3
<p>(c) how opinions expressed in response to -</p> <ul style="list-style-type: none"> (i) the invitation referred to in regulation 13(2)(d); (ii) action taken by the responsible authority in accordance with regulation 13(4), <p>- have been taken into account;</p>	Section 4 and Bristol Water's Statement of Response (see: https://www.bristolwater.co.uk/about-us/water-resources/).
<p>(d) how the results of any consultations entered into under regulation 14(4) have been taken into account;</p>	Not applicable - no transboundary consultation with other EU Member States took place
<p>(e) the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with; and</p>	Section 5
<p>(f) the measures that are to be taken to monitor the significant environmental effects of the implementation of the plan or programme.</p>	Section 6.
Monitoring of implementation of plans and programmes (SEA regulation 17)	
<p>(1) The responsible authority shall monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action.</p>	<p>Monitoring procedures are set out in Section 6.</p> <p>Bristol Water will identify effects and undertake remedial action (as necessary) as the WRMP is implemented.</p>
<p>(2) The responsible authority's monitoring arrangements may comprise or include arrangements established otherwise</p>	<p>The monitoring procedures set out in Section 6 will complement existing monitoring arrangements where possible.</p>

FINAL**SEA Regulations Requirement****Location in the Post Adoption Statement (where appropriate)**

than for the express purpose of complying with paragraph (1).



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Appendix B Environmental Report consultation responses

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Table B.1 Environment Agency (on the Environmental Report accompanying the Draft WRMP)

Consultation Question	Section	Consultee Response	Response/Action
Q1. Does the assessment set out in this SEA Environmental Report describe the likely significant environmental effects of the feasible and preferred options?		None received	N/A
Q2. Do you think that there are other likely significant environmental effects that should have been identified that would have affected the choice of preferred option included in the Draft Water Resources Management Plan?		The company has provided an estimation of carbon emissions for its baseline and final plan scenarios, however it has not described the greenhouse gas emissions that will occur as a result of each option required to maintain its supply demand balance, or stated where else this information is available.	<p>Comment noted.</p> <p>This comment was made in regard of the dWRMP; however, information is available in the Environmental Report which addresses the issue raised.</p> <p>Appendices E and F of the Environmental Report (for the SEA of the dWRMP) and of the revised Environmental Report (for the SEA of the revised draft WRMP) contains an estimate of the carbon emissions from construction and operation of each of the feasible and preferred options. The estimates include embodied carbon, using data derived from the Inventory of Carbon and Energy.</p> <p>The assessment of the significance of the carbon emissions is based on the definitions of significance provided in Appendix D of the Environmental Report.</p>
		The company has provided an estimation of the impacts of climate change on its future demand and supply forecasts. However, it has not described the impacts of climate change on each of its options in the final planning scenario.	<p>Comment noted.</p> <p>This comment was made in regard of the dWRMP; however, information is available in the Environmental Report which addresses the issue raised.</p>

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Consultation Question	Section	Consultee Response	Response/Action
			Appendix F of the Environmental Report (for the SEA of the dWRMP) and of the revised Environmental Report (for the SEA of the revised draft WRMP) contains an assessment of each of the preferred options against the SEA objective 6 'To limit the causes and potential consequences of climate change and to adapt to future changes'.
		The SEA report includes a useful summary in Figure 1.3 of the interlinkages between the SEA process and the development of the WRMP. The Assessment Methodology (section 4.4) outlines the two stage assessment approach to the options and Section 6.1 outlines in general terms how the results of the first stage were collated with other social and economic factors to identify the preferred options. There is no further explanation or evidence, however, of how specific environmental considerations identified as part of the SEA may have influenced the development of the plan.	<p>Comment noted.</p> <p>Section 6.1 and Section 6.3 of the revised Environmental Report provides information on the factors (and decision making processes) that informed the selection of the preferred options. In this regard, they are supplementary to the information outlined with the dWRMP with respect to the options appraisal, environmental appraisal and programme appraisal.</p> <p>The SEA Post Adoption Statement (PAS), consistent with regulation 16(4) of The Environmental Assessment of Plans and Programmes Regulations 2004, will include details of how environmental considerations have been integrated into the final WRMP and how the findings of the Environmental Report have been taken into account. The PAS will also present the reasons for choosing the options that make up the final WRMP, in the light of the others considered.</p>
Q3. Do you agree with the proposed arrangements for monitoring the significant effects of the implementation of the WRMP? If not, what measures do you propose?		None received	N/A
Other		The SEA does not currently include reference to Catchment Flood Management Plans (although there is a footnote at page 72); any specific Shoreline Management Plans (SMP) - such as the Severn	<p>Comment noted.</p> <p>Table 2.1 of the revised Environmental Report contains reference to the Bristol and Avon Catchment Flood Management Plan, the</p>

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Consultation Question	Section	Consultee Response	Response/Action
		Estuary SMP2 (although the general Defra guidance 2011 is included); Salmon Action Plans and Water Level Action Plans.	<p>Severn Estuary Shoreline Management Plans (SMP2) and updates to other national plans (such as the National Planning Policy Framework), the details of which are summarised in the updated Appendix B.</p> <p>The scope of the SEA (including the plans and programmes identified in Section 2 and Appendix B) was subject to scoping consultation which ended in May 2017. Three responses were received (including one from the EA) which are summarised in Appendix C of the Environmental Report. As a result, the list of plans and programmes was revised and the information used to support the assessment of the dWRMP presented in the Environmental Report.</p> <p>At scoping stage, the EA proposed additional plans for inclusion, and these were used to inform the revised scope of the assessment. The identification of additional information to inform the scope and context of the SEA, post assessment, whilst useful, will not have the same influence on the scope of the assessment. In consequence, whilst the review of plans and programmes has been updated to reflect the further additional plans identified, they have not been reflected in the assessment framework or subsequent assessment of options.</p>
		In the Baseline Analysis Section 3.2 (Bristol Water Supply Area) refers to the spatial scope of the assessment with reference to the Bristol Water Supply Area and cross-referencing to Figure 1.2 of the area. The baseline information is tailored to this area where available and where this is not possible the baseline data extends to the 4 main local authority areas. In this section there is improved cross-referencing to the illustrated figure and more consistent terminology. It would be useful, however, to clarify whether and how the spatial scope of the assessment has taken account of the potential impacts of options outside of the water supply area.	<p>Comment noted. No action proposed.</p> <p>Section 6.3 presents that assessment of cumulative effects, arising from population change in the Bristol Water area, NSIPs, Bristol Water's Drought Plan 2017; and other water company WRMPs. At the point of completion of the Environmental Report, the other dWRMPs were not available. Now that they have been published, an assessment has been undertaken. No additional effects have been identified.</p> <p>Bristol Water will continue to monitor the potential effects on water resources as part of the five yearly review of the WRMP.</p>

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Consultation Question	Section	Consultee Response	Response/Action
		<p>Option 32 – end bulk transfer to Wessex Water and use existing resource for Bristol Water supply.</p> <p>It is stated that this solution would result in no change in environmental impact. Although, this statement is logical the report does not appear to have established the extent of any current impact.</p>	<p>Comment noted.</p> <p>Following consultation on the draft WRMP and the responses from the regulators and consultees, further changes were made to the WRMP, which led to revisions to the forecast supply deficit (0.2 Ml/d at 2035 rising to 9.18 Ml/d at 2045). This has meant that Option 32 (ending the bulk supply) has not been needed.</p>
		<p>The SEA has scored 'o' impact on many of the feasible schemes where increased production and construction is involved. These schemes will involve some increased abstraction that could impact on flow, fish entrainment and recreation and construction that may impact biodiversity.</p>	<p>Comment noted.</p> <p>The assessment of feasible options identify a full range of positive and negative minor and significant effects. The neutral effects have been reviewed and considered in light of the definitions of significance and considered appropriate, noting the assumptions outlined.</p>

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Table B.2 Natural England (on the Environmental Report accompanying the Draft WRMP)

Consultation Question	Section	Consultee Response	Response/Action
Q1. Does the assessment set out in this SEA Environmental Report describe the likely significant environmental effects of the feasible and preferred options?		We broadly concur with the SEA conclusions in relation to Biodiversity. Whilst some negative outcomes are foreseeable we agree that mitigation should be possible. In addition, if implemented creatively we foresee that some of the Feasible Options have the potential for Biodiversity 'Net Gain'. Should these Feasible Options be taken forward we would encourage the company to develop them in the context of the Biodiversity Strategy scheme proposed in the PR19 WINEP and the company's Biodiversity Index. In addition we support the company's proposal to continue with catchment schemes around the Bristol Water reservoirs to improve raw water quality and we look forward to working with the company going forward to help secure all feasible benefits for biodiversity.	<p>Comment noted.</p> <p>Natural England's comments that they broadly concur with the SEA conclusions in relation to biodiversity is welcome.</p>
Q2. Do you think that there are other likely significant environmental effects that should have been identified that would have affected the choice of preferred option included in the Draft Water Resources Management Plan?		<p>Section 28G of the Wildlife and Countryside Act 1981, places a duty on public authorities, including water companies, to take reasonable steps consistent with the proper exercise of their functions to further the conservation and enhancement of SSSIs. These duties are mirrored in the general recreational and environmental duties placed on relevant undertakers in the Water Industry Act (1991) as amended. The Water Industry Strategic Environmental Requirements³ (WISER, page 29) sets out the expectations for delivery of these obligations.</p> <p>Companies are expected "to contribute to maintaining or achieving SSSI favourable condition both on [companies'] own land and in the catchments [companies] manage or impact on".</p> <p>The issues raised have the potential to apply to SSSIs and should be reviewed in the existing dWRMP SEA.</p> <p>We understand that the company are proposing to conduct a much more thorough environmental assessment of the potential vulnerabilities of the Bristol lake SSSIs between now and the PR24 review, taking into account the findings of PR14 and PR19 investigations. We are happy to provide further advice to the company on the scope of this assessment as this work progresses.</p>	<p>Comment noted.</p> <p>Appendix E and F of the Environmental Report (for the SEA of the dWRMP) and of the revised Environmental Report (for the SEA of the revised draft WRMP) includes an assessment of the construction and operational effects of feasible and preferred options on biodiversity including internationally or nationally designated conservation sites such as SACs, SPAs, Ramsar and SSSIs. Specific feasible options that include commentary include P01-02, P08, P10, R08-02, R08-03, R11, R23-01 and R24.</p> <p>The SEA of P08 and R24 has drawn on the findings of the revised WFD assessment and the conclusions are aligned.</p> <p>The offer of further advice from Natural England on any subsequent environmental assessments is welcome.</p>

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Consultation Question	Section	Consultee Response	Response/Action
		There are options in Bristol Water's dWRMP suite of Feasible Options which have the potential to impact protected landscapes should they go forward. To safely conclude that these could be considered 'viable' in the final plan, cumulative landscape impacts should be assessed before the final plan is submitted to ensure mitigation is possible, and mitigation should not be left to a piecemeal approach at the project stage.	<p>Comment noted.</p> <p>Appendix E and F of the Environmental Report for the SEA of the dWRMP) and of the revised Environmental Report (for the SEA of the revised draft WRMP) includes an assessment of the construction and operational effects of feasible and preferred options on landscape (SEA objective 12 'To conserve and enhance landscape character). A range of neutral, minor and significant effects on landscape have been identified for the feasible options whilst a range of neutral and minor effects on landscape have been identified for the preferred options. Section 6 of the Environmental Report includes an assessment of the combined effects of the preferred options on landscape, noting the potential for localised landscape and visual effects arising from temporary construction activities associated with P20.</p>
Q3. Do you agree with the proposed arrangements for monitoring the significant effects of the implementation of the WRMP? If not, what measures do you propose?		None received	N/A

wood.

