Cambridge Water

RICARDO

STRATEGIC ENVIRONMENTAL ASSESSMENT

Draft Water Resources Management Plan 2024

Cambridge Water

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Linton Water tower, Rivey Hill, Cambridge Water

NON-TECHNICAL SUMMARY

INTRODUCTION

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

WRMPs must comply with international, UK and national legislation pertaining to the environment, as well as associated guidance on the development of WRMPs[1]. This includes The Environmental Assessment of Plans and Programmes Regulations 2004 (the 'Strategic Environmental Assessment (SEA) Regulations'). The SEA Regulations require an assessment of the likely significant environmental effects of the plans and identifies ways in which adverse effects can be avoided, minimised or mitigated and how any positive effects can be enhanced. In doing so, the SEA will be used to inform the development and selection of the water resource management options that will comprise the WRMP24.

This Non-Technical Summary (NTS) provides an overview of the Environmental Report produced as part of the SEA of the draft WRMP24. The Environmental Report represents the second formal output of the SEA of the draft WRMP24 following a Scoping Report which was issued to SEA consultation bodies in April 2021.

The Environmental Report presents the findings of the SEA and is being issued for consultation alongside the draft WRMP24. The following sections of this NTS:

- provide an overview of the WRW Regional Plan and the Water Resource Management Plans (WRMPs).
- describe the SEA process together with how it is to be applied to the draft WRMP24.
- presents the key issues relevant to the SEA of the draft WRMP24.
- summarises the approach to undertaking the assessment of the draft WRMP24.
- summarises the findings of the SEA of the draft WRMP24 and any reasonable alternatives.
- outlines the proposed mitigation and enhancement measures identified.
- summarises the conclusions; and
- sets out the next steps in the SEA of the draft WRMP24.

WATER RESOURCE PLANNING

Consistent with the National Framework, water resources management planning is being undertaken regionally and by all water companies in England and Wales in order to ensure reliable, resilient water supplies over the long-term planning horizon.

Water Resources East (WRE) Regional Plan

Water Resources East (WRE) is one of five water resources groups working under the National Framework for Water Resources (the 'National Framework'). WRE is designed to oversee water resources planning for the East of England. It is formed of the water providers Anglian Water, Essex and Suffolk Water, Cambridge Water, Severn Trent Water and Affinity Water with input also from the Environment Agency.

- WRE has published a seven-part strategy for the region which seeks to:
- Work with all water users in Eastern England to become as water efficient as they can be.
- Retain and store more water in the landscape of the region.
- Move water into and around the region, from areas of surplus to areas of deficit.
- Link land and water management more effectively, increasing resilience and restoring and enhancing natural systems.

[1] UK Government (2022) *Water Resource Planning Guidance* (WRPG) [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline. [Accessed August 2022].

- Understand where abstraction is having a detrimental impact on the environment and develop options which restore and enhance it whilst ensuring sustainable economic development.
- Explore alternative sources of water, including desalinisation and water re-use.
- Contribute to low carbon strategies and plans to meet a net zero ambition.

The Regional Plan environmental assessment methodologies are being developed alongside those of the individual companies WRMPs. As South Staffs Water incorporates Cambridge Water, to ensure consistency across the approaches and allow integration of outcomes, the proposed methodology for Cambridge Water will closely follow that provided in the Water Resources West (WRW) and South Staffs Water Strategic Environmental Assessment Scoping Report which has been previously agreed with the statutory consultees (Natural England, Environment Agency and Historic England). As the methodology used for the Cambridge Water WRMP and other WRE assessments follow ACWG methodology this will facilitate integration across assessments.

Cambridge Water's Water Resource Management Plan 2024 (WRMP)

Cambridge Water's draft WRMP24 sets out the proposals to ensure continued delivery of a secure and reliable supply of water from 2025 to 2050, looking beyond out to the year 2100.

Cambridge Water's proposed best value plan is focussed on delivering targets to

- halve leakage by 2050 and triple rate of leakage reduction
- reduce customer consumption to 110 litres per person per day by 2050
- reduce non household consumption by 9% by 2037 in line with the proposed Environment Act target.

Underpinning this is the company's programme of universal metering it is proposing to undertake between 2025 and 2035, which will provide invaluable information to support changes to customer behaviour as well as aiding with the targeting and delivery of leakage reductions.

Cambridge Water's baseline demand forecast shows an increase of around 9% across the 25-year planning horizon, excluding the impacts of new demand management programmes, and so the leakage reduction, water efficiency and metering measures will increase resilience in the supply.

The draft WRMP24 proposes the eighteen feasible supply options across the draft WRMP24 operational area and 3 key areas of demand management to deliver demand side options.

Cambridge Water has also developed and applied a number of scenarios relating to alternative futures covering some key uncertainties, including the impacts of climate change, alternative phasing, changes to environmental destination and the pace of technological change.

The draft WRMP24 also assumes delivery of an environmental destination scenario by 2050. This scenario will continue to take shape over time.

WHAT IS STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)?

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

SEA is a systematic decision support process, aiming to ensure that the likely significant environmental effects of plans and programmes are identified, described to avoid, manage, or mitigate any significant adverse effects and to enhance any beneficial effects. In this context, the purpose of SEA is to encourage relevant plan authors to integrate environmental considerations into the development of any plan or programme. Generally, a SEA is therefore conducted before an Environmental Impact Assessment (EIA) is undertaken.

In this context, the purpose of the SEA of the draft WRMP24 is to:

- identify the potentially significant environmental effects of the draft WRMP24 in terms of the measures being considered by Cambridge Water for water resource management.
- help identify appropriate measures to avoid, reduce or manage adverse effects and to enhance beneficial effects associated with the implementation of the draft WRMP24 wherever possible.

- give the statutory SEA bodies, stakeholders and the wider public the ability to see and comment upon the effects that the draft WRMP24 may have on them, their communities, and their interests, and encourage them to make responses and suggest improvements to the draft WRMP24; and
- inform Cambridge Water's selection of measures to be taken forward into the final WRMP24.

SEA comprises five key stages:

- **Stage A**: Scoping.
- **Stage B**: Develop and Refine Alternatives and Assess Effects.
- **Stage C**: Prepare Environmental Report.
- **Stage D**: Consult on the Draft Plan and Environmental Report and Prepare the Post Adoption (SEA) Statement; and
- **Stage E**: Monitor Environmental Effects.

Stage A of the SEA of the WRMP24 led to the production of the WRW Regional Plan and WRMP24 SEA Scoping Report (as the work was undertaken as part of the development of the consistent suite of assessment methodologies to be applied to water resource plan within the WRW region). The scoping stage itself comprised five tasks that are listed below:

i. Review of other relevant policies, plans, programmes, and strategies (hereafter referred to as 'plans and programmes').
ii. Collation and analysis of baseline information.
iii. Identification of key sustainability issues.
iv. Development of an assessment framework.
v. Consultation on the scope of the SEA (this Scoping Report).

Information collected and analysed (as part of tasks i and ii) covers England reflecting Cambridge Water's operational area. The Scoping Report set out the proposed framework for assessing the likely significant environmental effects of the draft WRMP24 (as well as the WRW Regional Plan. It was issued for scoping consultation from 22 April 2022 to 29 May 2022. The representations received and how they have been taken into account are presented in **Appendix B**.

Following scoping consultation and amendment as appropriate, the framework has been used to assess the likely significant environmental effects (including cumulative effects) of the water resource options contained in the draft WRMP24 and any reasonable alternatives (Stage B).

These assessments are presented in this Environmental Report (in a form to meet the requirements of Schedule 2 of the SEA Regulations) which has been completed to accompany the draft WRMP24 (Stage C).

The draft WRMP24 and accompanying documents including the Environmental Report will then be submitted to the Secretary of State for Environment, Food and Rural Affairs, for a request for publication and once directed to do so, Cambridge Water will publish the documents for consultation (Stage D). Following consultation, and within 26 weeks of consultation beginning, Cambridge Water will need to prepare a Statement of Response to the representations received. A revised draft WRMP24 will be sent to the Government if changes are significant and may be subject to further assessment and consultation. Following direction from the Government, the final WRMP24 will be published and implemented accordingly (anticipated September 2023). In conjunction with publishing the final WRMP24, a Post Adoption Statement will also be issued (to meet the requirements of SEA regulation 16 (4)). This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final plan.

The SEA requires monitoring of any resulting environmental effects of the WRMP24 (Stage E).

Section 1.4 of the Environment Report describes in further detail the requirement for SEA of the draft WRMP24 and the SEA process including its relationship with the preparation of the Cambridge Water's draft WRMP24.

WHAT ARE THE KEY ISSUES FOR THE WRW REGIONAL PLAN AND WRMPS?

As part of the SEA process, a review has been undertaken to identify the key economic, social and environmental issues which are relevant to the assessment of the draft WRMP24. These issues have been identified from a variety of sources, including a review of baseline data and other relevant plans and

programmes. A summary of the issues identified as being most relevant to the assessment of the draft WRMP24 are shown in **Table NTS.1**.

Table NTS.1 Key Issues Relevant to the Draft WRMP24

Topic Area	Key Environmental, Social and Economic Issues Relevant to the WRMP24
Biodiversity, Flora and Fauna	• The need to protect or enhance the region's biodiversity, particularly protected sites designated for nature conservation and rare and valuable habitat such as chalk streams. • The need to avoid activities likely to cause irreversible damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors. • The need to recognise the importance of allowing wildlife to adapt to climate change. • The need to control the spread of Invasive Non-Native Species (INNS). • 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 ecosystem services.
Soils, Land Use and Geology	• The need to protect geological features of importance and maintain and enhance soil function and health. • The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources). • The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region
Water	• The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives. • 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 water and groundwater. • 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. • The need to further improve the quality of the regions' river and estuarine waters taking into account WFD objectives. • 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. • 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 water and groundwater. • The need to reduce and manage flood risk.
Air Quality	• The need to minimise emissions of pollutant gases and particulates and enhance air quality. • The need to reduce greenhouse gas emissions arising from implementation of the WRMP;
Climatic Factors	• The need to minimise emissions of pollutant gases and particulates and enhance air quality. • 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.
Population and Human Health	• The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water and sewerage services for health and wellbeing. • The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas.

Topic Area	Key Environmental, Social and Economic Issues Relevant to the WRMP24
	• The need to ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population. • The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment. • The need to accommodate an increasing population. • 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 well-being and the economy. • The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas. • The need to ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population.
Material Assets and Resource Use	• The need to minimise the consumption of resources, including water and energy. • The need to reduce the total amount of waste (from all sources) produced in the region, promote recycling and reduce the proportion of waste sent to landfill • The need to recognise waste as a potential resource and reuse waste productively where possible to support development of the circular economy. • The need to continue to reduce leakage from the water supply system • Promote the efficient use of water to help reduce future demand for water. • The need to support regional and national commitments to decarbonisation.
Cultural Heritage	• The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their settings, particularly those which are sensitive to the water environment. • The need to protect water-dependent heritage sites during drought conditions.
Landscape	• The need to protect and improve the natural beauty of the region's National Parks and other landscapes of natural beauty. • The need to protect and improve the character of landscapes and townscapes.

The key issues listed in **Table NTS.1** above have informed the proposed framework that will be used to assess the effects of the draft WRMP24.

Section 2 of the Environmental Report summarises the review of plans and programmes relevant to the draft WRMP24 and SEA that is contained at Appendix C.

Section 3 presents an overview of the baseline analysis of social, economic and environmental characteristics, and identification of the key issues and their relevance to the assessment. The detailed baseline information is presented in Appendix D.

HOW HAVE THE EFFECTS OF THE DRAFT WRMP AND ANY REASONALE ALTERNATIVES BEEN ASSESSED?

A draft assessment framework was developed to assess the economic, social and environmental effects of the draft WRMP24, and revised to reflect scoping consultation comments. This framework sets out a number of assessment objectives relating to the key issues identified in **Table NTS.1**. For each objective, guide questions are also provided. The assessment framework that has been used to assess the draft WRMP24 is shown in **Table NTS.2**.

Table NTS.2 Assessment Framework for the Draft WRMP24

Topic	Assessment Objective
Biodiversity, Flora and Fauna	1. To protect and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.

Topic	Assessment Objective
	2. To protect and enhance sustainable natural resources and the ecosystem services they provide.
	3. To avoid and, where required, manage invasive and non-native species (INNS).
Soils, Land Use and Geology	4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.
Water – Quantity	5. To protect and enhance surface and ground water levels and flows.
Water –Quality	6. To protect and enhance the quality of surface and groundwater resources.
Water – Flood Risk	7. To reduce or manage flood risk.
Air	8. To minimise emissions of pollutant gases and particulates and enhance air quality.
Climatic Factors	9. To reduce greenhouse gas emissions.
	10. To adapt and improve resilience to the threats of climate change.
Population	11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.
	12. To maintain and enhance tourism and recreation.
Human Health	13. To protect and enhance human health and well-being.
Material Assets - Water Resources	14. To promote and enhance the sustainable and efficient use of resilient water resources.
Material Assets – Waste and Resource Use	15. To minimise waste, promote resource efficiency and move towards a circular economy.
Cultural Heritage	16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.
Landscape	17. To conserve, protect and enhance landscape and townscape character and visual amenity.

The effects of the draft WRMP24 have been assessed in a staged process, complementary to the development of the plans, and reflecting the decision-making requirements, as follows:

- **Revised feasible option assessment**: a high-level assessment of all revised feasible options (including resource management and demand management options) against the 17 SEA assessment objectives detailed in **Table NTS.2** with findings used to inform the plan decision making.
- **Preferred option assessment**: for those options selected, a more detailed assessment has been undertaken of the preferred plan options against the 17 SEA assessment objectives detailed in **Table NTS.2**.
- **Preferred programme assessment**: the cumulative effects of the preferred programme of options have been completed, to ensure that the effects of the draft Plan have been identified, described and evaluated.
- **Reasonable alternative plan assessments**: the cumulative effects of any alternative plans are identified, described and evaluated for consideration along with the preferred plan *(noting that no alternative programmes have been identified).*

The draft WRMP24 options have been assessed based on the nature of the effect, its timing and geographic scale, the sensitivity of the human or environmental receptor that could be affected, and how long any effect

might last. Assessment matrices have been used to capture the assessment of each measure in a consistent manner.

Specific guidance has been developed for what constitutes a significant effect, a minor effect or a neutral effect for each of the SEA objectives. These 'definitions of significance' help to ensure a consistent approach to interpreting the significance of effects and will help the reader understand the decisions made by the assessor.

Section 4 of the Environmental Report provides further information in relation to the approach to the assessment of the draft WRMP24.

WHAT ARE THE LIKELY SIGNIFICANT EFFECTS OF THE REVISED FEASIBLE OPTIONS?

Overview

In support of the development of the draft WRMP, the SEA has considered a total of eighteen feasible supply options and three demand management options across the Cambridge Water supply area.

Each option was assessed against the SEA objectives to identify the likely environmental effects during both construction/implementation and operation. The options were assessed based on the nature of the effect, its timing and geographic scale, the sensitivity of the human or environmental receptor that could be affected, and how long any effect might last. Where quantified information was available for the option from Cambridge Water, the assessment was also informed by reference to threshold values set out in definitions of significance (see **Appendix E** to the Environmental Report).

The findings of the assessments are summarised below. **Section 5** of the Environmental Report presents the detailed results of the feasible options assessment, whilst the individual feasible option assessment matrices are presented in **Appendix F** to the Environmental Report.

Supply Options

All 18 options were assessed as having a negative impact on biodiversity (**SEA Objective 1**) during construction. One option has been identified as having moderate negative effects due to the proximity to designated biodiversity sites and assets, with uncertainty until final scheme design is confirmed. The remaining seventeen options have all been identified as minor negative effects on biodiversity, some with uncertainty. During operation, one option is assessed as having moderate negative impacts to biodiversity assets and a further five assessed as minor negative. No options provide benefits to **SEA Objective 1** during operation or construction.

Following BNG assessments, one option was identified to have a major negative impact on **SEA Objective 2** during construction with a further two options being assessed as having moderate negative effects. In terms of bringing positive impacts to Sustainable Natural Resources, two options have been assessed as moderate positive effects, with 12 minor positive as the overall biodiversity net gain is anticipated to be greater when in operation for the majority of options. Two options are set to have a moderate negative impact on **SEA Objective 2** during operation.

All options have been assessed as having minor negative impacts on INNS (**SEA Objective 3**) during construction with two options additionally having negative impacts during operation, one moderate and one of minor significance against **SEA Objective 3**.

One option has been identified as major negative against **SEA Objective 4** due to the permanent and temporary loss of best and most versatile agricultural land as a result of infrastructure construction. Two options have been assessed as resulting in moderate negative effects (proximity to historic landfill sites) and 11 as minor negative due to temporary and or partial loss of land. Four options were assessed as minor negative uncertain as the location of specific assets is unconfirmed, these options also experienced minor positive impacts (development of previously developed land) during construction.

For water quantity (**SEA Objective 5**) no impacts have been identified for any of the 18 options during construction. In operation, two options were assessed as having moderate negative effects as the capture of rainwater would intercept flow to the watercourse and five options were assessed as having a minor negative impact during operation. For **SEA Objective 6**, all options were assessed as having a minor impact on water quality during construction. In operation, two were assessed as moderate negative and five as a minor negative

effect, one with uncertainty until specific option details available. Three options were assessed as having a minor positive impact during operation on water quality through reduction of diffuse source pollution.

Two options were assessed as having a moderate negative impact during construction and providing a moderate benefit during operation for **SEA Objective 7**. Construction of the schemes, although partly in Flood Zone 2, will result in infrastructure that will help alleviate and mitigate against future flood risk. A further seven options were assessed as minor negative in construction and two options had minor positive uncertain effects due to provision of additional storage in the catchment.

For air quality (**SEA Objective 8**), all options were assessed as having a minor negative effect during construction except one option which has been assessed as having moderate negative effects due to the scale of construction and potential for high volume of construction traffic. All the air quality assessments have been classified as uncertain given the requirement for further vehicle movement data.

SEA Objective 9 has a total of three options that have been assessed as having moderate negative effects during the construction phase due to the significant embodied carbon and greenhouse gas emissions associated with the construction materials. One option was assessed as having a major negative impact during operation due to the significant amount of energy required to operate this option. One additional option has also been identified as moderate negative during operation on greenhouse gas emissions.

All eighteen options were assessed as having a positive impact on **SEA Objective 10** (Climate Resilience) during operation with one option assessed as having a moderate positive impact as a result of the additional water resource and increased resilience created from option operation.

For **SEA Objective 11**, 15 options were assessed as having a positive impact on the local economy during construction, 12 were assessed as significant and one as moderate positive. One option is assessed as having a major positive impact during operation with 15 having moderate positive impacts and three a minor positive effect. The overall positive impact to **SEA Objective 11** is a result of likely employment opportunities and supply chain benefits as well as increased spend in the local economy by contractors and construction workers as well as increased supply of water to support a growing economy.

One option was assessed as having a moderate negative impact on tourism and recreation during construction due to the impact on assets used by the public however this option is set to create additional recreational assets in operation which will provide a minor benefit to **SEA Objective 12**. A further eight options were assessed as having minor negative effects on tourism and recreation.

All but one option is set to provide positive impacts during operation for human health and well-being (**SEA Objective 13**) due to the additional water resource generated. One option is to have major benefits with 15 having a moderate positive impact. All options experience negative effects during construction, 14 of minor and four of moderate significance.

14 options were assessed as having a positive impact on water resource use (**SEA Objective 14**) as a result of increased resilience of water resources within the Cambridge Water supply area, two of which are of moderate significance. No options have been assessed to have an effect on this objective during construction.

All options assessed to have a negative impact on **SEA Objective 15** (Waste and Resource Use) during construction. Two options were assessed as having a major negative impact with one having a moderate impact on waste and resource use due to the significant requirement of raw construction material. Four options will bring moderate benefits during operation due to the option incorporating sustainable design. 17 options were assessed as negative in operation, one option experiencing moderate effects due to the additional energy and chemical usage. Most options have been assessed as uncertain for this objective as the amount of waste that will be generated is currently unknown.

Major negative impacts have been identified for two options on cultural heritage (**SEA Objective 16**) due to encroachment and permanent loss of land within cultural heritage assets. No positive effects have been identified as associated with any options.

No options are set to have a positive impact on landscape (**SEA Objective 17**) during construction or operation. One moderate negative impact has been identified during construction as have 13 minor negative effects, owing to the temporary disturbance to the landscape. Four options experienced negative effects in both construction and operation as they result in permanent feature that could alter the existing landscape.

Table NTS.3 lists the feasible supply options and summarises the findings of the assessment against the 17 SEA objectives detailed in **Table NTS.2**.

Demand Management Options

Neutral effects were identified for the majority of SEA objectives. Minor positive effects were identified for all three demand measures for water quantity (**SEA Objective 5**) due to the additional yield reducing the need to abstract more water. Minor positive effects were also identified for climate resilience (**SEA Objective 10**). Moderate positive effects were identified for the economy (**SEA Objective 11**) and human health and wellbeing (**SEA Objective 13**) for two options in addition to minor positive effects for the remaining option. This is largely due to the additional yield providing support to the local population. Two minor positive effects were identified for water resource use (**SEA Objective 14**) as the measures involve reducing leakage or improving water efficiency.

Table NTS.4 lists the feasible demand options and summarises the findings of the assessment against the 17 SEA objectives detailed in **Table NTS.2**.

WHAT ARE THE LIKELY SIGNIFICANT EFFECTS OF THE DRAFT WRMP AND ANY REASONABLE ALTERNATIVES?

Cambridge Water's draft WRMP14 sets out the proposals to ensure continued delivery of a secure and reliable supply of water from 2025 to 2050 and beyond. Cambridge Water's proposed preferred programme is focussed on the following:

- To reduce leakage by 50% by 2050, and triple the rate of leakage reduction in AMP8
- To reduce per capita consumption (PCC) to 110 litres per person by 2050
- To reduce non-household consumption by 9% by 2037
- To roll out universal SMART metering between 2025-2035

Additionally, Cambridge Water have evaluated a number of supply side options and propose a number of significance investments to meet the deficits in supply due to environmental need. These proposals will assist in improving resilience to drought events in the long-term and once the preferred programme has been rolled out, before 2040, Cambridge Water will be resilient to a 1 in 500 drought event.

The draft WRMP24 proposes implementation of ten supply side options and three demand side options across the Cambridge Water supply area to meet the supply demand deficit.

Table NTS.3 and **Table NTS.4** list the preferred supply and demand options and summarises their findings.

The detailed assessment of the preferred options is contained in Section 6.2. The assessment of the preferred programme of options is available in Section 6.3 and the cumulative effects of the Draft WRMP in-combination with other plans and programmes is detailed in Section 6.4.

The detailed option assessments are presented in Appendix G.

WHAT ARE THE PROPOSED MITIGATION AND ENHANCEMENT MEASURES?

As noted above, in some cases, there is an opportunity to reduce some of the potential negative effects identified during the assessment of the draft WRMP24 and to enhance positive effects. The detail of this mitigation needs to be considered during the planning phases of each of the individual component schemes if taken forward.

A summary of potential mitigation measures will be included in Section 6.5.

HOW WILL THE EFFECTS OF THE WRMP BE MONITORED?

Once the WRMP is implemented, its effects on the environment and people will need to be monitored. Monitoring the significant 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?

Section 7 of the Environmental Report identifies a number of potential indicators that could be used for monitoring the effects of the WRMP's implementation. Monitoring proposals will be considered further

and a final monitoring framework that satisfies the requirements of the SEA Directive will be presented in the Post Adoption Statement.

WHAT ARE THE CONCLUSIONS?

The draft WRMP24 sets out the proposals Cambridge Water plans to undertake to maintain the balance between available water supply and demand over the next 25 years and beyond. The WRMP is focussed on delivering targets to halve leakage and reduce customer consumption to 110 litres per person per day by 2050. In addition, the plan targets 9% reduction of non-household consumption by 2037, in line with the proposed Environment Act target. Underpinning this is the company's programme of universal metering it is proposing to undertake, which will provide invaluable information to support changes to customer behaviour as well as aiding with the targeting and delivery of leakage reductions.

The draft WRMP24 proposes to implement ten supply options and three demand options across the Cambridge Water supply area. Cambridge Water have tested the draft preferred plan by applying a number of scenarios relating to alternative futures covering some key uncertainties, including the impacts of climate change. Under all scenarios, the preferred plan selected the same feasible options required to meet the deficit and, as a result, there is no alternative or adaptive plan.

Overall, the draft WRMP24 is expected to generate significant positive effects across several SEA objectives including economy (SEA Objective 11), human health and well-being (SEA Objective 13) and water resources (SEA Objective 14) and the provision of over 140Ml/d of clean drinking water which would support economic growth whilst maintaining a healthy and sustainable populations.

Where negative effects have been identified, generally, these are expected to be either minor or moderate only, although uncertainties remain. The exception to this is in respect of soils, land use and geology (SEA Objective 4), greenhouse gas emissions (SEA Objective 9), resource use (SEA Objective 15) and cultural heritage (SEA Objective 16) where significant negative effects have been identified during construction. However, these effects reflect the emissions to air, energy and resource use associated with the implementation of the water management measures which is to a large extent unavoidable (although effects may be reduced at the project stage through, for example, the use of renewable energy and sustainably sourced construction materials). Significant negative effects on soils and land use and cultural heritage may be mitigated through best practice construction methods as well as scheme specific mitigation or re-siting of pipeline routes and other infrastructure. Further review of these effects will need to be considered at project level therefore uncertainties remain.

The WFD compliance assessment found potential non-compliance issues with the preferred programme. These have been assessed as low confidence and further investigation is necessary to understand he hydrological impacts and improve the confidence in this assessment.

The HRA has provisionally concluded that there are sufficient standard and best practice mitigation measures that can be implemented during construction to avoid adverse effects for the supply side options. Further hydrological assessment and surveys to confirm presence and use of offsite functionally linked habitat will be required for a number of options ahead of project-level HRAs.

For demand options, these measures are likely to require some form of physical intervention or amendment to infrastructure (e.g. pipe repair), some instances of effect pathways might be conceivable but it is not possible to predict or identify specific locations where such measures might be applied and so effects on specific European sites cannot be identified. However, it is very likely that adverse and/or significant effects could be avoidable at a scheme level; Therefore, from an HRA perspective, the options are 'screened in' (as an effect pathway is conceivable) but as a meaningful appropriate assessment is not possible, the assessment is necessarily deferred to the project level.

Detailed mitigation and enhancement measures have been identified to help avoid, minimise, reduce or mitigate effects where identified.

WHAT ARE THE NEXT STEPS IN THE SEA PROCESS?

This Environmental Report is being issued for consultation to the SEA consultation bodies (the Environment Agency, Historic England and Natural England in England) and provided as part of the evidence base to support the consultation on the draft WRMP24. The consultation will run from February 2023 – May 2023.

Details of how to respond to the consultation are provided in **Box NTS.1.**

Box NTS.1: How to respond to the consultation

This Consultation: How to Give Us Your Views

We would welcome views on any aspect of this report. However, responses to the following questions would be particularly welcomed:

1. **Do you think that the Environmental Report has correctly identified the likely significant effects of the draft WRMP24? If not, what other significant effects do you think we have missed, and why?**
2. **Do you agree with the conclusions of the Environmental Report and the recommendations concerning the mitigation and enhancement of significant effects?**
3. **Do you agree with the proposed arrangements for monitoring the significant effects of the implementation of the draft WRMP24? If not, what measures do you propose?**

Please provide your comments within 14 weeks following publication. You can e-mail your responses to WRMP.ConsultationCAM@south-staffs-water.co.uk.

Table NTS.3 Assessment of the Draft WRMP24 Preferred Plan Supply Options

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
01A	Construction (negative)	-/?	-	-	-	0	-	-	-/?	0	0	0	-	-	0	-	0	0	LSEs identified – construction and operation	Compliant (medium confidence)	**Construction:** No significant positive or negative effects have been identified during construction. A minor positive effect was identified for economy as the option is expected to have a minor positive effect on employment during construction. Minor negative effects have been identified for a range of objectives. Construction activities may result in a pollution incident (e.g. sedimentation) which would result in minor negative effects on aquatic species (SEA Objective 1) and water quality (SEA Objective 6). There may be noise, dust and vibration effects on residential receptors (SEA Objective 13). There would also be a minor negative effect on waste and resources as a number of elements requiring new resources (SEA Objective 15). The pipeline traverses valuable agricultural land (SEA Objective 4) and two national cycle routes (SEA Objective 12) and Flood Zone 3 areas (SEA Objective 7). **Operation:** No significant positive or negative effects have been identified during operation. The reduction in flows will have minor negative effects on biodiversity due to minor degradation of habitats, water quantity (SEA Objective 5) and water quality as the rivers buffering capacity may be reduced. A minor positive effect was identified for SEA Objective 2 as it is assumed that operational biodiversity net gain would be greater than the net loss in construction and in consequence, an equivalent positive score to the negative score in construction is provided. The additional yield (0.55 Ml/d) will provide additional climate resilience (SEA Objective 10).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0			
	Operation (negative)	-/?	0	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0			
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	0	0	0	0	0	0	0			
01B	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	-	-	0	-	0	0	LSEs identified – construction and operation	Compliant (medium confidence)	**Construction:** No significant positive or negative effects have been identified during construction. A minor positive effect was identified for economy as the option is expected to have a minor positive effect on employment during construction. Minor negative effects have been identified for a range of objectives. Construction activities may result in a pollution incident (e.g. sedimentation) which would result in minor negative effects on aquatic species (SEA Objective 1) and water quality (SEA Objective 6). There may be noise, dust and vibration effects on residential receptors (SEA Objective 13). There would also be a minor negative effect on waste and resources as a number of elements requiring new resources (SEA Objective 15). The pipeline traverses valuable agricultural land (SEA Objective 4) and a national cycle route (SEA Objective 12) and Flood Zone areas (SEA Objective 7).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0			

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
	Operation (negative)	-/?	0	0	0	-	-	0	0	-	0	0	0	0	0	-	0	0			Increased vehicle movements will have a negative effect on air quality (SEA Objective 8) meanwhile, the use of materials and vehicles and the associated embodied carbon will have a minor effect on greenhouse gas emissions (SEA Objective 9). **Operation:** No significant positive or negative effects have been identified during operation. The reduction in flows will have minor negative effects on biodiversity (SEA Objective 1) due to minor degradation of habitats, water quantity (SEA Objective 5) and water quality (SEA Objective 6) as the rivers buffering capacity may be reduced. A minor positive effect was identified for SEA Objective 2 as it is assumed that operational biodiversity net gain would be greater than the net loss in construction and in consequence, an equivalent positive score to the negative score in construction is provided. The additional yield (0.55 Ml/d) will provide additional climate resilience (SEA Objective 10) as well as support to the economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13).
	Operation (positive)	?	+	0	0	0	0	0	0	0	+	+	0	+	0	0	0	0			
37Aii	Construction (negative)	-	0	-	-/?	0	-	-	-/?	-	0	0	-	--	0	-/?	-/?	0	No LSEs anticipated	Compliant (high confidence)	**Construction:** A significant positive effect has been identified during construction as the option is expected to have a significant positive effect on employment during construction. A moderate negative effect on human health (SEA Objective 13) was identified due to the effects from construction (e.g. noise, dust, vibration) on nearby residential receptors. A moderate positive effect is expected on construction related employment (SEA Objective 11). Minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. The option encourages sustainable design by incorporating rainwater harvesting resulting in a moderate positive effect on SEA Objective 15. Operation of the option will require the use of energy resulting in minor negative effects on greenhouse gas emissions (SEA Objective 9) and resource use (SEA Objective 15). The additional yield (0.55 Ml/d) will provide minor positive effects for climate resilience (SEA Objective 10) whilst supporting the local economy (SEA Objective 11) and human health and wellbeing (Objective 13).
	Construction (positive)	0	0	0	+	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0			
	Operation (positive)	0	0	0	0	0	0	0	0	0	+	+	0	+	0	++	0	0			
38B	Construction (negative)	-	0	-	-/?	0	-	0	-/?	-	0	0	0	--	0	-/?	0	-	No LSEs anticipated	Non-compliant (low confidence)	**Construction:** The capital expenditure will provide a significant increase in construction employment (SEA Objective 11). The option is located in an urban area and construction activities would have moderate negative effects on residential receptors (e.g. dust, noise, vibrations) (SEA Objective 13). Minor effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. The option will result in permanent habitat loss and moderate negative effects on SEA Objective 2. The option would intercept
	Construction (positive)	0	0	0	+	0	0	0	0	0	0	+++	0	0	0	0	0	0			

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
	Operation (negative)	-	--	0	0	--	--	0	0	-	0	0	0	0	0	-	0	-/?			rainwater and reduce flows in a river already experiencing flow pressures (SEA Objective 5) and could exacerbate water quality effects from point source pollution (SEA Objective 6). Operation of the option will require the use of energy resulting in minor negative effects on greenhouse gas emissions (SEA Objective 9) and resource use (SEA Objective 15). A few positive effects have been identified. For example, the option encourages sustainable design by incorporating rainwater harvesting resulting in a moderate positive effect on SEA Objective 15 and promotes water efficiency resulting in a minor positive effect on SEA Objective 14. The additional yield (0.9 Ml/d) will provide minor positive effects for climate resilience (SEA Objective 10) whilst supporting human health and wellbeing (SEA Objective 13).
	Operation (positive)	0	0	0	0	0	+	+/?	0	0	+	0	0	+	+	++	0	0			
57	Construction (negative)	--/?	--	-	---	0	-	--	-/?	--	0	0	-	-	0	--/?	---	-	LSEs identified – construction only	Compliant (low confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). A significant negative effect was identified for SEA Objective 16 as there is a scheduled monument within the area of the embankment reservoir and construction of the scheme would result in the permanent loss of this heritage asset. This would also result in a significant land-take of valuable land (SEA Objective 4). Moderate and minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. Moderate negative effects were identified for INNS (SEA Objective 3) as the new reservoir is fed by raw water abstraction establishing a transfer pathway. The option would require additional energy usage and have a moderate negative effect on operational carbon emissions (SEA Objective 9) and resource use (SEA Objective 14). Moderate positive effects have been identified where the additional 7Ml/d resilience would increase the resilience of water resources in the supply area (SEA Objective 14) whilst support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). In addition, this option would involve the construction of an open embankment reservoir which is partially located within flood zone 3 and therefore has the potential to help alleviate or mitigate flood risk in the catchment resulting a moderate positive effect on Flood Risk (SEA Objective 7).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	-	0	--	0	-	-	0	0	--	0	0	0	0	0	--/?	0	0			
	Operation (positive)	0	+	0	0	0	0	++	0	0	+	++	0	++	++	0	0	0			
71	Construction (negative)	-	--	-	--	0	-	0	-/?	--	0	0	-	-	0	---/?	---	-	No LSEs anticipated	Compliant (low confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). A significant negative effect was identified for SEA Objective 16 as the proposed pipeline intersects a conservation area which is listed on Historic England's 'Heritage at Risk' register. A significant negative uncertain effect was identified for Waste and Resource Use (SEA Objective 15) as the option requires new infrastructure with limited opportunities to reuse or recycle waste materials. The volume of materials required is unknown but given the scale of the option and using cost as a proxy is expected to be a major amount with uncertainty until these details are confirmed. Land acquisition for the new WTW will have a permanent moderate negative effect on BNG (SEA Objective 2) and on land-use (SEA Objective 4) as the site is within valuable Grade 2 agricultural land. Construction will use a moderate amount of materials as well as
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
	Operation (negative)	-	0	0	0	-	-	0	0	-	0	0	0	0	0	-/?	0	0			vehicle usage which will contribute to embodied carbon (SEA Objective 9). Minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. Moderate positive effects have been identified where the additional 7Ml/d resilience would support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). A moderate positive effect was also identified for SEA Objective 2 as it is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided. Minor positive effects have also been identified for some other objectives.
	Operation (positive)	0	++	0	0	0	+	0	0	0	+	++	0	++	+	0	0	0			
73A	Construction (negative)	-/?	---	-	--	0	-	--	--/?	--	-/?	0	--	-	0	---/?	-	--	LSEs identified – construction only	Compliant (high confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). The various components of this option are extensive with a potential significant negative effect on SEA Objective 2. The option is expected to have a major effect on waste and resources with volumes currently unknown (SEA Objective 15). Moderate and minor negative effects have been identified for a range of other objectives. **Operation:** The operational carbon emissions are estimated to be significant (SEA Objective 9). The additional 50Ml/d resilience would provide significant positive effects support the local economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13). Moderate positive effects were identified for several other objectives.
	Construction (positive)	0	0	0	0	0	0	0	0	0	?	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	-	0	-	-/?	0	0	---	0	0	0	0	0	-	0	-			
	Operation (positive)	0	++	0	0	0	0	++	0	0	++	+++	+	+++	++	0	0	0			
75Aiii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-	LSEs identified – construction only	Compliant (high confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). Construction works may result in sedimentation which may affect qualifying features of the Ouse Washes SAC (spined loach) and the waterbird assemblage associated with the SPA and Ramsar sites. The HRA Stage 2 Appropriate Assessment concluded that with appropriate mitigation there will be no adverse effects during construction, however without further option details there is still some uncertainty. The activities may result in minor negative effects on water quality and quantity. Further minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-			

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0			Moderate positive effects have been identified where the additional 7Ml/d resilience would support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). Further minor positive effects have been identified for other objectives.
75Biii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-	LSEs identified – construction only	Compliant (high confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). Construction works may result in sedimentation which may affect qualifying features of the Ouse Washes SAC (spined loach) and the waterbird assemblage associated with the SPA and Ramsar sites. The HRA Stage 2 Appropriate Assessment concluded that with appropriate mitigation there will be no adverse effects during construction, however without further option details there is still some uncertainty. The activities may result in minor negative effects on water quality and quantity. Further minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. Moderate positive effects have been identified where the additional 7Ml/d resilience would support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). Further minor positive effects have been identified for other objectives.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-			
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0			
75Ciii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-	LSEs identified – construction only	Compliant (high confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). Construction works may result in sedimentation which may affect qualifying features of the Ouse Washes SAC (spined loach) and the waterbird assemblage associated with the SPA and Ramsar sites. The HRA Stage 2 Appropriate Assessment concluded that with appropriate mitigation there will be no adverse effects during construction, however without further option details there is still some uncertainty. The activities may result in minor negative effects on water quality and quantity. Further minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. Moderate positive effects have been identified where the additional 7Ml/d resilience would support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). Further minor positive effects have been identified for other objectives.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-			
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0			

Table NTS.4 Summary of the preferred demand management option assessment

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	Commentary
50 % leakage reduction	Construction (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	?	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** Operation of the option would result in a reduction in leakage from the supply network. The additional capacity of 6.25 Ml/d will have moderate positive effects on the local economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13). The additional capacity will have minor positive effects on water quantity (SEA Objective 5), climate resilience (SEA Objective 10) and water resource use (SEA Objective 14).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	
	Operation (negative)	?	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	++	0	++	+	0	0	0	
110 l/h/d (including water labelling)	Construction (negative)	0	0	0	0	0	0	0	?	-/?	0	0	0	0	0	?	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This is a water efficiency option with a design capacity of 10.89 Ml/d. The additional capacity of 10.89 Ml/d will have moderate positive effects on the local economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13). The additional capacity will have minor positive effects on water quantity (SEA Objective 5), climate resilience (SEA Objective 10) and water resource use (SEA Objective 14).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	
	Operation (negative)	?	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	++	0	++	+	0	0	0	
9% NHH reduction	Construction (negative)	0	0	0	0	0	0	0	?	?	0	0	0	0	0	?	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This is a water efficiency option with a design capacity of 3.78 Ml/d. The additional capacity will have minor positive effects on the local economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13) as well as water quantity (SEA Objective 5) and climate resilience (SEA Objective 10).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	
	Operation (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	+	0	+	0	0	0	0	

CONTENTS

1. INTRODUCTION

1.1 OVERVIEW

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

WRMPs must comply with international, UK and national legislation pertaining to the environment, as well as associated guidance on the development of WRMPs[2]. This includes The Environmental Assessment of Plans and Programmes Regulations 2004 (the 'Strategic Environmental Assessment (SEA) Regulations' The SEA Regulations require an assessment of the likely significant environmental effects of the plans and identifies ways in which adverse effects can be avoided, minimised or mitigated and how any positive effects can be enhanced. In doing so, the SEA will be used to inform the development and selection of the water resource management options that will comprise the WRMP24.

Cambridge Water forms part of the Water Resources East (WRE)[3] regional group and is one of five regional water resources groups in England and Wales working under the National Framework for Water Resources (the 'National Framework')[4]. Each regional group brings together the water companies operating in that region with key water users, stakeholders and environmental regulators including the Environment Agency. This enables greater co-ordination and alignment of water resources planning for WRMP and regional plan development. The other water companies that form WRE alongside Cambridge Water are Affinity Water, Anglian Water, Essex & Suffolk Water and Severn Trent Water.

In addition, Cambridge Water are merged with South Staffs Water. South Staffs Water are one of five water companies[5] that make up the Water Resource West (WRW) regional group. As such, there is also the requirement for the Cambridge Water WRMP to align with that of South Staffs Water and the WRW regional plan.

1.2 PURPOSE OF THE ENVIRONMENTAL REPORT

The purposes of the report are:

- to ensure that the likely significant environmental and socio-economic effects of the draft WRMP24 and any reasonable alternatives are identified, characterised and assessed.
- to help identify appropriate measures to avoid, reduce or mitigate adverse effects and to enhance beneficial effects associated with the implementation of the draft WRMP24 wherever possible.
- to provide a framework for monitoring the potential significant effects arising from the implementation of the draft WRMP24.
- to give the statutory consultees, stakeholders and the wider public the opportunity to review and comment upon the environmental effects that the draft WRMP24 may have on them, their communities and their interests, and to encourage and support them to make responses and suggest improvements to the draft WRMP24.
- to inform 's decisions on the draft WRMP24; and
- to demonstrate that the draft WRMP24 has been developed in a manner consistent with the requirements of the SEA Regulations.

[2] UK Government (2022) *Water Resource Planning Guidance* (WRPG) [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline. [Accessed August 2022].

[3] https://wre.org.uk/

[4] https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources

[5] Along with Severn Trent Water, United Utilities Water, Dŵr Cymru Welsh Water and Hafren Dyfrdwy

1.3 WATER RESOURCE PLANNING

Water resources management planning is being undertaken regionally and by all water companies in England and Wales in order to ensure reliable, resilient water supplies over the long-term planning horizon.

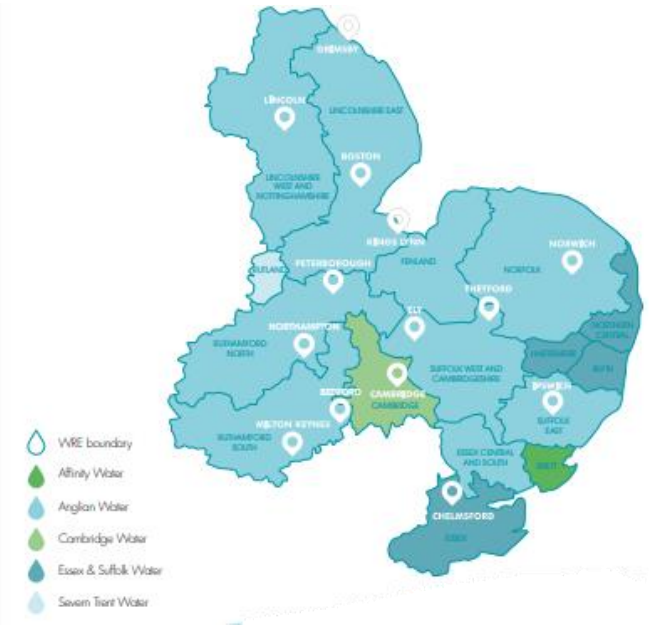
Water resources management planning includes working out and forecasting how much water customers will need over the planning period (assessing demand) and how best to provide it (assessing options to reduce or constrain demand growth and/or augment reliable supplies of water) in an efficient, timely manner (programme appraisal). Companies (individually, and in collaboration across a region) identify the preferred, 'best value' programme of demand management and water supply options to develop an overall strategy to maintain a balance between reliable supply and demand.

Water companies in England and Wales have a statutory requirement to prepare a WRMP every five years. Cambridge Water is developing its draft WRMP24 within the context of Water Resources West (WRW) Regional Plan.

1.3.1 Water Resources East Regional Plan

Water Resources East (WRE) is one of five water resources groups working under the National Framework for Water Resources (the 'National Framework'). WRE is designed to oversee water resources planning for the East of England. It is formed of the water providers Anglian Water, Essex and Suffolk Water, Cambridge Water, Severn Trent Water and Affinity Water with input also from the Environment Agency (**Figure 1.1**).

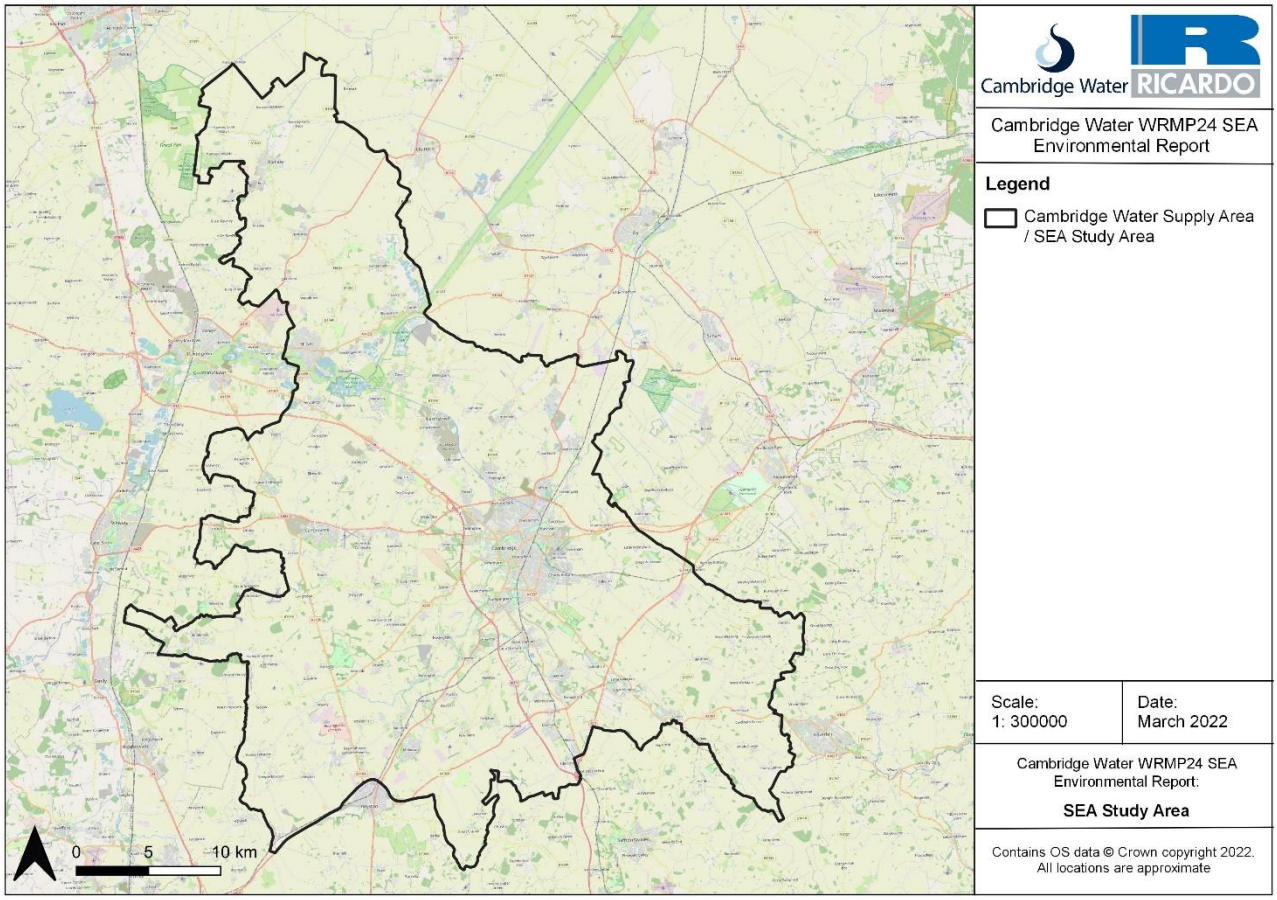
Figure 1.1 Water companies operating in the WRE region



- WRE has published a seven-part strategy for the region which seeks to:
- Work with all water users in Eastern England to become as water efficient as they can be.
- Retain and store more water in the landscape of the region.
- Move water into and around the region, from areas of surplus to areas of deficit.
- Link land and water management more effectively, increasing resilience and restoring and enhancing natural systems.
- Understand where abstraction is having a detrimental impact on the environment and develop options which restore and enhance it whilst ensuring sustainable economic development.
- Explore alternative sources of water, including desalinisation and water re-use.
- Contribute to low carbon strategies and plans to meet a net zero ambition.

The Regional Plan environmental assessment methodologies are being developed alongside those of the individual companies WRMPs. As South Staffs Water incorporates Cambridge Water, to ensure consistency across the approaches and allow integration of outcomes, the proposed methodology for Cambridge Water will closely follow that provided in the Water Resources West (WRW) and South Staffs Water Strategic Environmental Assessment Scoping Report which has been previously agreed with the statutory consultees (Natural England, Environment Agency and Historic England). As the methodology used for the Cambridge Water WRMP and other WRE assessments follow ACWG methodology this will facilitate integration across assessments.

Figure 1.2 SEA Study Area



1.3.2 Water Resource Management Plans

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

For the Water Resource Zone[6] (WRZ) in the WRMP area, a supply demand balance is generated for public water supply (PWS). A set of non-PWS water availability assessments will also be generated. Each supply-demand balance will be structured around a consistent "central" set of planning assumptions and will be used to identify WRZs in deficit over the plan period.

The plan process initially reviews as many potential solutions as possible (the 'unconstrained list' of options) to identify 'feasible' options for each WRZ which will contribute to meeting the supply demand deficit in one or more zones. Types of options considered to provide additional water resources to meet any forecast deficit in a WRZ can include:

- **demand management options** which include measures to manage the demand for water such as smart meters, rainwater harvesting, greywater recycling or household visits to install water efficiency measures.
- **distribution and leakage options** which include measures to optimise the efficiency of water networks, reduce leakage and minimise any unscheduled resource losses.
- **production efficiency options** include measures to increase the efficiency and effectiveness of treatment processes.

[6] Section 4.4. of the WRPG defines a water resource zone as "*an area within which the sources of water and distribution of water to meet demand, is largely self-contained (apart from any agreed bulk transfers)*".

- **supply options** which include measures to increase supply such as greater peak output at existing groundwater sources, reservoir or surface water supply and which will include SROs; this also includes catchment management options, for example nature-based solutions.
- **non-PWS options** which include any options which increase water resource availability or reduce the need for abstraction outside of that needed for public water supplies.

Examples of these options are shown in **Table 1.1**. Note, that this illustrative and not intended to be an exhaustive list.

Table 1.1 Example Feasible Option Types

Customer Options	Distribution Options	Production Options	Resource Options
Change in levels of service	Active leakage management	Outage reduction	Aquifer Recharge
Household water audit	External potable bulk supply/transfer	Water Treatment Works capacity increase	Catchment management
Household water recycling	Internal potable transfer	Water Treatment Works loss recovery	Conjunctive Use
Metering change of occupancy	Mains replacement (not trunk mains)		Desalination
Metering compulsory	Other leakage control		Drought permits/orders, Temporary Use bans or non-essential use bans
Metering optants	Pressure management		Effluent Reuse
Metering other selective	Trunk mains renewal		External raw water bulk supply/transfer
Non-household water audit			Groundwater enhancement
Other water efficiency			Internal raw water transfer
Rainwater harvesting			Internal raw water transfer
Retrofitting indoor water efficiency devices			Licence Trading
Supply pipe repairs / replacement			New groundwater
Tariff			New Reservoir
Water efficiency customer education / awareness			New surface water
Drought - water use restrictions			New water treatment works
			Reduction of raw water losses
			Reservoir enlargement
			Surface water enhancement

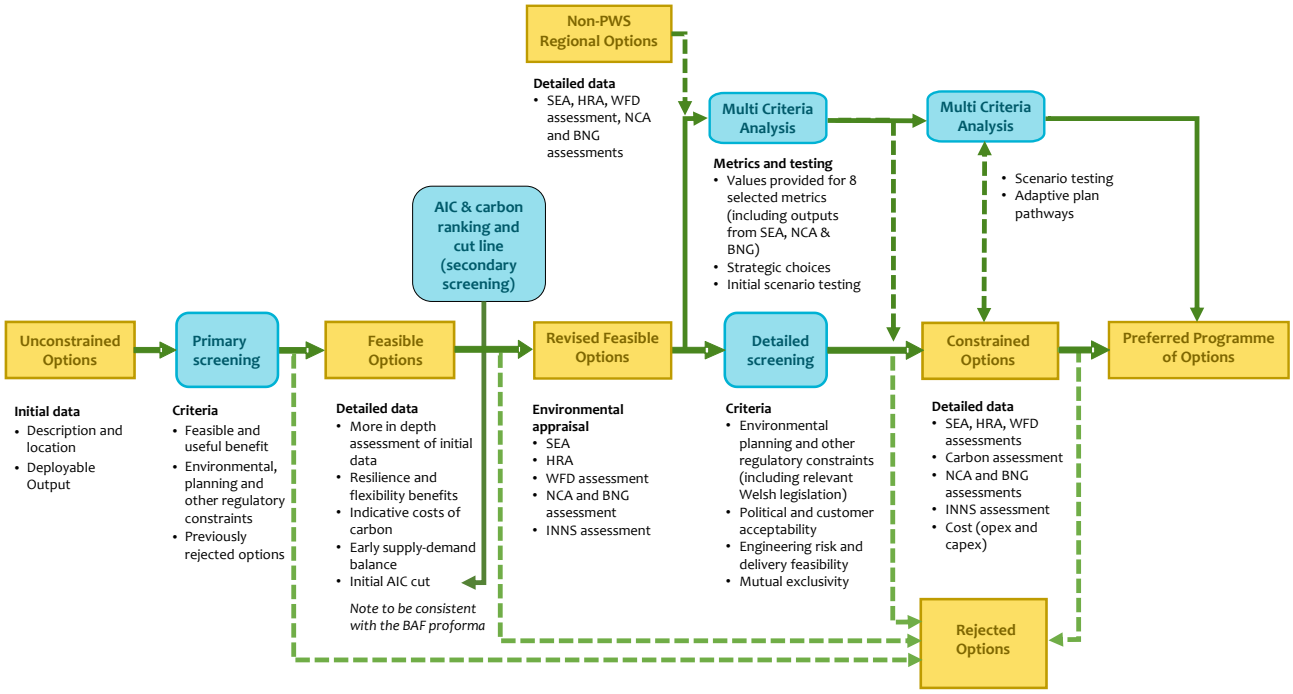
Options tend to be generated from the company responsible for the WRMP but can also be joint[7] (where more than one company is working in partnership), provided by third parties or be multi-sector.

All zones with deficits are then subject to a "decision making" process using a Multi-Criteria Analysis (MCA) and option screening to identify a preferred plan (comprising of selected options) to address the supply demand deficit. The MCA is used consistently to supplement the traditional Economics of Balancing Supply and Demand (EBSD) approach and further zonal specific decision methods can also be used appropriate to the complexity of the zone. The decision-making method factors in multiple costs and benefits and consider the interaction between zones to establish a best value plan for the company (and for the region as whole).

Scenarios are then used to test the preferred and any identified alternative plans. They are used to explore what would happen if one of these plans was adopted and the future was different to that assumed in the "central" planning assumptions. The scenarios could be used to make the preferred plan an adaptive plan (in which different options could be taken forward after key decision points, if circumstances changed).

The process, and key decision points in the development of the WRMP and WRW Regional Plan are illustrated in **Figure 1.3**

Figure 1.3 Environmental assessments into option and plan development



Environmental assessment information (derived from the SEA and other regulatory assessments) has been provided for the following key decision points:

- **Multi-Criteria Analysis (MCA**, Cambridge Water in alignment with South Staffs Water have applied a best value optimisation tool, ValueStream, to provide equivalent monetised costs for best value metric scores, enabling option comparison.
- **Detailed screening** of options, using screening criteria aligned to that used and developed by South Staffs Water (in conjunction with WRW, the other core member companies of WRW and with regulator feedback).
- **Scenario testing** of options; and **selection of the preferred programme of options**.

7 There are five Strategic Resource Options (SROs) being taken forward by the companies (the Severn Thames Transfer, Grand Union Canal transfer, Minworth Effluent Reuse, Severn Trent Sources and the North West Transfer (formerly Vyrnwy Reservoir Source and United Utilities Sources)). The Severn to Thames transfer is an example of partnership between STW, STW and Thames Water.

1.3.2.1 Cambridge Water's Draft Water Resource Management Plan

Cambridge Water's draft WRMP24 sets out the proposals to ensure continued delivery of a secure and reliable supply of water from 2025 to 2050, looking beyond out to the year 2100.

Cambridge Water's proposed best value plan is focussed on delivering targets to halve leakage by 2050 and triple rate of leakage reduction, reduce customer consumption to 110 litres per person per day by 2050 and reduce non household consumption by 9% by 2037 in line with the proposed Environment Act target.

This is underpinned by a programme of universal metering between 2025 and 2035, which will provide invaluable information to support changes to customer behaviour as well as aiding with the targeting and delivery of leakage reductions.

The WRMP24 is following a 'twin track' approach to appraising and addressing the supply-demand deficit, with supply options being explored alongside demand management and leakage reduction to reduce water consumption per person/per property within Cambridge Water's supply area.

Cambridge Water's baseline demand forecast shows an increase of around 9% across the 25-year planning horizon, excluding the impacts of new demand management programmes, and so the leakage reduction, water efficiency and metering measures will increase resilience in the supply.

Cambridge Water has explored a wide range of supply options in parallel and tested both demand and supply options to ensure the preferred plan selected delivers the best value for both customers and the environment.

Cambridge Water has also developed and applied a number of scenarios relating to alternative futures covering some key uncertainties, including the impacts of climate change, alternative phasing, changes to environmental destination and the pace of technological change *(noting that no alternative programmes have been identified*)..

1.4 STRATEGIC ENVIRONMENTAL ASSESSMENT

1.4.1 Overview

SEA is required under Statutory Instrument 2004 No.1633 - The Environmental Assessment of Plans and Programmes Regulations 2004. Throughout the course of the development of the plan, policy or programme, the aim of SEA is to identify the potential impact of options proposed in the plan in terms of their environmental, economic and social effects. If any adverse effects are identified, these options can then be avoided, or proposals modified to manage or mitigate adverse effects.

The SEA Regulations transposed the requirements of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment. Following the UK's exit of the EU and the end of the transition period (31st December 2020), the SEA Directive no longer applies to the UK.

1.4.2 Applying SEA to the WRMP's and Regional Plan

The SEA Regulation 5 requires "an environmental assessment … of certain plans and programmes which are likely to have significant effects on the environment". Plans and programmes are defined as those:

- *"Which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government; and*
- *which are required by legislative, regulatory or administrative provisions"* (Regulation 2 (1)).

Guidance produced by the European Commission (EC)[8] indicates that in preparing plans for ensuring water resources, privatised utilities companies can be considered an authority because they are providing services that would be carried out by public authorities in a non-privatised regime. The preparation of a WRMP is a statutory requirement and therefore meets the requirements of Regulation 2.

Plans and programmes that may have significant effects on the environment are identified as those:

8 EC (2003) Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment. Available online: http://ec.europa.eu/environment/archives/eia/pdf/030923_sea_guidance.pdf

- *"Which are prepared for… water management… and which set the framework for future development consent of projects listed in Annexes I and II to Directive 85/337/EEC [the Environmental Impact Assessment Directive]; or*
- *which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of Directive 92/43/ EEC [the Habitats Directive]"* (Regulation 5 (2)).

Broadly, this includes plans that may include development of infrastructure to source, store, transfer or manage water, or may affect sites that have European designations (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Ramsar sites).

Government[9], regulator[10] and industry[11] guidance indicates that there is a requirement for water companies, as responsible authorities, to determine if their WRMPs fall within the scope of the SEA Regulations and whether a SEA must be undertaken. The Welsh Government's guidance[12] on WRMPs, meanwhile, identifies environmental legislation relevant to the WRMP. As it is possible that the draft WRMPs could affect England and Wales, the UK SEA Regulations, as opposed to the Welsh SEA Regulations,[13] will apply.

1.4.3 Applying SEA to Water Resource Management Plans

Cambridge Water's draft WRMP24s will be subject to SEA. SEA is required based on the scope of the potential effects that could arise, particularly given the number and area covered by European designated conservation sites in the operational area covered by the WRMP. In this context, the purpose of the SEA of the draft WRMP24 will be to:

- identify the potentially significant environmental effects of the draft plan in terms of the water resource management options being considered.
- help identify appropriate measures to avoid, reduce or manage adverse effects and to enhance beneficial effects associated with the implementation of the draft plan wherever possible.
- give the statutory SEA bodies, stakeholders and the wider public the ability to see and comment upon the effects that the draft plan may have on them, and encourage them to make responses and suggest improvements to the draft plans; and
- inform the selection of water resource management options to be taken forward into the final versions of the WRMP24.

In summary, the SEA will identify, describe, and assess the likely significant effects arising from the following aspects of the WRMP24:

- the feasible water resource options.
- the preferred water resources options.
- the preferred programme of options selected to comprise the preferred plan to address the supply demand deficit.
- any alternative plans proposed to address the supply demand deficit.
- any cumulative, secondary and/or synergistic effects of implementing the plans.

9 Office of the Deputy Prime Minister (ODPM), Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland (2005) A Practical Guide to the SEA Directive and European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites and Welsh Government (2015) Strategic Environmental Assessment (SEA) in Wales

10 EA, OfWAT and NRW (2022) Water Resource Planning Guidance [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline

11 UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans. Report Ref. No. 21/WR/02/15

12 Welsh Government (2022) The Welsh Government Guiding Principles for Developing Water Resources Management Plans (WRMPs) 2022. Available at: https://gov.wales/sites/default/files/publications/2021-12/water-resources-management-plan-guidance-2022.pdf Accessed August 2022].

13 Statutory Instrument 2004 No. 1656 The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004

Where relevant, any assessment work that has already been completed e.g., as part of the RAPID[14] gated submission process for the SROs, this will be used to inform the assessments of the options as they are presented.

1.4.4 Stages of Strategic Environmental Assessment

SEA comprises five key stages:

- **Stage A:** Scoping.
- **Stage B:** Develop and Refine Alternatives and Assess Effects.
- **Stage C:** Prepare Environmental Report.
- **Stage D:** Consult on the Draft Plan and Environmental Report and Prepare the Post Adoption (SEA) Statement; and
- **Stage E:** Monitor Environmental Effects.

Stage A of the SEA of the WRMP24 led to the production of the WRMP24 SEA Scoping Report[15]. The assessment methodologies align with those developed for South Staffs WRMP24 (and WRW Regional Plan). The scoping stage itself comprises five tasks that are listed below:

i. Review of other relevant policies, plans, programmes and strategies (hereafter referred to as 'plans and programmes').

ii. Collation and analysis of baseline information.

iii. Identification of key sustainability issues.

iv. Development of the assessment framework.

v. Consultation on the scope of the SEA (this Scoping Report).

Information collected and analysed (as part of tasks i and ii) covers England reflecting the Cambridge Water operational area. The Scoping Report set out the proposed framework for assessing the likely significant environmental effects of the draft WRMP24). It was issued for scoping consultation from 22 April 2022 to 29 May 2022. The representations received and how they have been taken into account are presented in **Appendix B**.

Once it has been consulted on and amended as appropriate, the framework is used for assessing the effects (including cumulative effects) of the water resource options contained in the draft WRMP24 and any reasonable alternatives (**Stage B**). The effects (including cumulative effects) of the water resource options contained in the draft WRMP24 and any reasonable alternatives have then been assessed (**Stage B**).

These assessments are presented in this Environmental Report (in a form to meet the requirements of Schedule 2 of the SEA Regulations) which has been completed to accompany the draft WRMP24 (**Stage C**).

The draft WRMP24 and accompanying documents including the Environmental Report will then be submitted to the Secretary of State for Environment, Food and Rural Affairs, for a request for publication and once directed to do so, Cambridge Water will publish the documents for consultation (**Stage D**). Following consultation, and within 26 weeks of consultation beginning, Cambridge Water will need to prepare a Statement of Response to the representations received. A revised draft WRMP24 will be sent to the Government, if changes are significant, and may be subject to further assessment and consultation. Following direction from the Government, the final WRMP24 will be published and implemented accordingly (anticipated Autumn 2023). In conjunction with publishing the final WRMP24, a Post Adoption Statement will also be issued (to meet the requirements of SEA regulation 16 (4)). This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final plan.

14 Regulators Alliance for Progressing Infrastructure Development (RAPID) was established in 2019 to "help accelerate the development of new water infrastructure and design future regulatory frameworks. The joint team is made up of the 3 water regulators Ofwat, Environment Agency and Drinking Water Inspectorate". Available online https://www.ofwat.gov.uk/regulated-companies/rapid/3/ [Accessed January 2022]

15 Wood and Ricardo (2021) Water Resources West and Water Resources Management Plan 2024 Strategic Environmental Assessment Scoping Report, Water Resources West, Dŵr Cymru Welsh Water, Hafren Dyfrdwy, Severn Trent, South Staffordshire Water, United Utilities

The SEA requires monitoring of any resulting environmental effects of the WRMP24 (**Stage E**).

1.5 HABITATS REGULATIONS ASSESSMENT

Regulations 63 and 64 of The Conservation of Habitats and Species Regulations (2017) (the 'Habitats Regulations') transpose the provisions of Articles 6(3) and 6(4) of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') as they relate to plans or projects in England and Wales. Regulation 63 states that if a plan or project is *"(a) is likely to have a significant effect on a European site*[16] *or a European offshore marine site*[17] *(either alone or in combination with other plans or projects); and (b) is not directly connected with or necessary to the management of the site*" then the competent authority must "…*make an appropriate assessment of the implications for the site in view of that site's conservation objectives*" before the giving consent or authorisation (etc.).

The plan or project can only be given effect if it can be concluded (following an 'appropriate assessment') that it *"…will not adversely affect the integrity*" of a site, unless the provisions of Regulation 64 are met.

The process by which Regulation 63 (and, if applicable, Regulation 64) is met is known as HRA[18]. An HRA determines whether there will be any 'likely significant effects' on any European site as a result of a plan's implementation (either on its own or 'in combination' with other plans or projects)[19] and, if so, whether there will be any 'adverse effects on site integrity'[20].

Water resource plans (whether WRMPs or Regional Plans) are not explicitly included within this legislation, although the regulator guidance[21] requires that it should extend to the WRMP if the preferred plan "*would be likely to have a significant effect on a European site (either alone or in combination with other plans or projects)*". The Habitats Regulations require every Competent Authority, in the exercise of any of its functions, to have regard to the requirements of the Habitats Directive. The water companies have a statutory duty to prepare WRMP24 and are therefore the Competent Authority for an HRA.

Whilst the HRAs has been undertaken and reported separately from the SEAs, its findings will be used as appropriate to inform the findings of this SEA, notably against the biodiversity, fauna and flora topic.

The HRA of Cambridge Water's draft WRMP24 also contributes towards the HRA of the accompanying WRE draft Regional Plan. In this way it contributes to the evidence for how the water companies have coordinated their water resources planning activities and considered the needs of multiple sectors (aligned with WRE Regional Plan).

1.6 WATER FRAMEWORK DIRECTIVE ASSESSMENT

The Water Framework Directive[22] (WFD) has been enacted into UK legislation as the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 in England and Wales.

The WFD sets a default objective for all rivers, lakes, estuaries, groundwater and coastal water bodies to achieve 'good' status or potential by 2027 at the latest. The current (baseline) status (e.g., 2015 classification), and the measures required to achieve the 2027 status objective, are set out for each water body in the relevant River Basin Management Plans (RBMPs), prepared by the EA and NRW every six years. The current RBMPs (known as the 'Cycle 2 plans') were published in February 2016 and are expected to be updated in September 2022.

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[16] Strictly, 'European sites' are: any Special Area of Conservation (SAC) from the point at which the European Commission and the UK Government agreed the site as a 'Site of Community Importance' (SCI) (if this was before 31 Jan 2020); any classified Special Protection Area (SPA); and any candidate SAC (cSAC). However, the term is also commonly used when referring to potential SPAs (pSPAs), to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') apply; and to possible SACs (pSACs) and listed Ramsar Sites. "European site" is therefore used in this proposal in its broadest sense, as an umbrella term for all of the above designated sites.

[17] 'European offshore marine sites' are defined by Regulation 18 of *The Conservation of Offshore Marine Habitats and Species Regulations 2017*; these regulations cover waters (and hence sites) over 12 nautical miles from the coast.

[18] The term 'Appropriate Assessment' has been historically used to describe the process of assessment; however, the process is now more accurately termed 'HRA', with the term 'Appropriate Assessment' limited to the specific stage within the process.

[19] Also referred to as the 'test of significance'.

[20] Also referred to as the 'integrity test'.

[21] EA, OfWAT and NRW (2022) *Water Resources Planning Guideline*

[22] European Union (2000) Directive 2000/60/EC of the European Parliament and of the Council. Following the UK's exit from the European Union on 31.12.20, the Directive no longer applies to the UK.

Cambridge Water (for the draft WRMP24) must be able to demonstrate that the plan will not cause a deterioration in respect of these baseline conditions. Furthermore, for those water bodies that are not currently attaining good status, Cambridge Water must be able to confirm that it would not preclude the delivery of measures to facilitate the improvements needed to attain good status.

A separate WFD assessments has been undertaken to provide the evidence base to respond to these requirements. Where appropriate, the findings have been used to inform this SEA, notably against the water quality topic.

1.7 BIODIVERSITY NET GAIN AND NATURAL CAPITAL

The requirements for a BNG and NCA of a water company WRMP are outlined in WRPG 2022, Section 4.1.1., (produced by the regulatory bodies Ofwat, Environment Agency and Natural Resources Wales). This states that water companies are required to ensure their WRMP delivers net biodiversity gain where appropriate and uses a proportionate natural capital approach. The EA and NRW have published separate supplementary guidance on Environment and Society in decision-making[23,24], which provides more detail about the expectation for NCA or ecosystem resilience in England and Wales respectively, and how a Natural Capital Assessment (NCA) and ecosystem resilience can support decision-making. The purpose of this is to allow water companies and Regional Groups to "make decisions that do not devalue and look to enhance the value of the natural world for society benefit" (WRPG Supplementary Guidance8) together with supporting water companies within WRE to promote plans that have the potential to deliver wider environmental and social benefits.

BNG is an approach to the development of land and marine management that aims to leave biodiversity in a measurably better condition than prior to development. BNG seeks to provide a means of quantifying losses or gains in biodiversity value bought about by changes in land use, when designed and delivered well, BNG can secure benefits for nature, people and places, and for the economy.

NCA studies key components of nature which are essential for the long-term provision of benefits on which society relies. These components can have a direct or indirect value to people. A natural capital approach, which has been followed in this assessment, understands that nature underpins human wealth, health, wellbeing and culture and seeks to demonstrate the value of the natural environment for people and the economy.

Natural assets provide ecosystem services such as regulating floods and improving air quality, and those ecosystem services provide benefits such as reducing the chance a house will flood or improved health. This benefit can then be valued through use of natural capital metrics and can be used to help in the support of delivery of targets, such as putting a value on the potential delivery of BNG.

1.8 ENVIRONMENTAL REPORT STRUCTURE

The remainder of this Environmental Report is structured as follows:

- **Section 2: Review of Plans and Programmes** - Provides an overview of the review of those plans and programmes relevant to the draft WRMP and SEA that is contained at **Appendix C**;
- **Section 3: Baseline Analysis** - Presents an overview of the baseline analysis and identifies the key issues relevant to the draft plan and SEA with the detailed social, economic and environmental characteristics presented in **Appendix D**;
- **Section 4: Approach to the Assessment** - Outlines the revised approach to the SEA of the draft WRMP including the assessment framework comprising assessment objectives and guide questions, categorisation of effects, matrices and definitions of significance/thresholds (**Appendix E**);
- **Section 5: Assessment of the Revised Feasible Options** - Presents the findings of the assessment of the likely significant effects of the draft WRMP's revised feasible options (detailed assessment matrices for revised feasible options presented in **Appendix F**);
- **Section 6: Assessment of the Draft WRMP** - Presents the findings of the assessment of the preferred options and preferred programme of options that comprise the draft WRMP and any

[23] EA (2021) WRPG 2024 supplementary guidance – Environment and society in decision-making. Published 24/03/2021

[24] NRW (2021) WRPG 2024 supplementary guidance – Environment and Society in decision-making (Wales). Published 07/04/2021

reasonable alternatives, including consideration of cumulative effects and mitigation (with detailed assessment matrices for options presented in **Appendix G**);

- **Section 7: Next Steps and Proposals for Monitoring** - Details the next steps in the SEA process and presents views on how the environmental effects of the WRMP will be monitored.

The report also contains the following appendices:

- **Appendix A: Quality Assurance Checklist.**
- **Appendix B: Schedule of Scoping Consultation Reponses.**
- **Appendix C: Review of Plans and Programmes.**
- **Appendix D: Baseline Analysis.**
- **Appendix E: Definitions of Significance.**
- **Appendix F: Revised Feasible Options Assessment**
- **Appendix G: Preferred Options Assessment.**

1.9 HOW TO COMMENT ON THE ENVIRONMENTAL REPORT

This Environmental Report is being issued for consultation to the SEA consultation bodies (the Environment Agency, Historic England and Natural England) and provided as part of the evidence base to support the consultation on the draft WRMP24. The consultation will run from **February 2023 - May 2023.**

Details of how to respond to the consultation are provided below.

This Consultation: How to Give Us Your Views

We would welcome views on any aspect of this report. However, responses to the following questions would be particularly welcomed:

1. **Do you think that the Environmental Report has correctly identified the likely significant effects of the draft WRMP24? If not, what other significant effects do you think we have missed, and why?**
2. **Do you agree with the conclusions of the Environmental Report and the recommendations concerning the mitigation and enhancement of significant effects?**
3. **Do you agree with the proposed arrangements for monitoring the significant effects of the implementation of the draft WRMP24? If not, what measures do you propose?**

Please provide your comments by 19 May 2023. You can e-mail your responses to WRMP.ConsultationCAM@south-staffs-water.co.uk

2. REVIEW OF PLANS AND PROGRAMMES

2.1 OVERVIEW

The SEA Regulations require a report containing "an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes" (Schedule 2(1)) as well as "The environmental protection objectives, established at international (European) Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation" (Schedule 2(5)).

One of the first steps in undertaking the SEA of the draft plans is therefore to identify and review other relevant plans and programmes which could influence the plan. These may be plans and programmes at an international/European, national, regional, or sub-regional level, commensurate with the scope of the draft WRMP24. The review aims to identify the relationships between the draft plans and these other documents i.e., how the draft WRMP24 could be affected by the other plans' and programmes' aims, objectives and/or targets, or how it could contribute to the achievement of their environmental and sustainability objectives. It is also a valuable source of information to support the completion of baseline analysis and to determine the key issues for the draft plans and SEA (see **Section 3** and **Appendix D**).

The completed review of plans and programmes is used to provide the policy context for the subsequent assessment process and helps to inform the development of objectives that comprise the assessment framework (see **Section 4**).

2.2 SUMMARY OF THE REVIEW OF PLANS AND PROGRAMMES

Over 100 international/European, national, regional/sub-regional and local level plans and programmes have been reviewed in preparing this Environmental Report.

Those that are relevant to the WRMP are listed in **Table 2.1**. These are summarised in **Appendix C.**

Table 2.1 List of Plans and Programmes relevant to the WRMP

International
Council of Europe (2000) European Landscape Convention (Florence Convention)
Council of Europe (2003) European Soils Charter
European Commission (1999) Landfill of Waste Directive (1999/31/EC)
European Commission (2002) Directive on the Energy Performance of Buildings (2002/91/EC)
European Commission (2005) Thematic Strategy on Air Pollution
European Commission (2006) Thematic Strategy for Soil Protection
European Commission (2008) Ambient Air Quality Directive (2008/50/EC)
European Commission (2008) Revised Waste Directive (2008/98/EC)
European Commission (2009) Promotion of the use of energy from renewable sources Directive (2009/28/EC)
European Commission Blueprint to Safeguard Europe's Water Resources
European Commission Drinking Water Directive (1998/83/EC) (amended 2015)
European Commission Environmental Liability Directive (2004/35/EC)
European Commission Floods Directive (2007/60/EC)
European Commission Nitrates Directive (91/676/EEC)
European Commission Revised Bathing Water Quality Directive (76/160/EEC)
European Commission Urban Waste Water Treatment Directive (91/271/EEC)

European Commission, (2020) The 8th Environmental Action Programme to 2030

European Commission, Birds Directive (2009/147/EC)

European Commission, Directive on Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC)

European Commission, Drinking Water Directive (1998/83/EC) (as amended)

European Commission, Fresh Water Fish Directive (2006/44/EC)

European Commission, Habitats Directive (1992/43/EEC)

European Commission, SEA Directive (2001/42/EC)

European Commission, The EU Biodiversity Strategy to 2020

European Commission, The Groundwater Directive (2006/118/EC)

European Commission, The Water Framework Directive (2000/60/EC)

ICOMOS (2011) Guidance on Heritage Impact Assessments for Cultural World Heritage Properties

IUCN (2013) World Heritage Advice Note: Environmental Assessment

Ramsar Convention, The Convention on Wetlands of International Importance (1971)

The Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)

The Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983)

The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention)

The Environment Noise Directive (Directive 2002/49/EC)

The European Convention on the Protection of Archaeological Heritage (Valletta Convention)

The World Heritage Convention (UNESCO) 1972

UNESCO (2001) Convention on the Protection of Underwater Cultural Heritage

United Nations (1992) Convention on Biological Diversity (CBD)

United Nations (1992) Framework Convention on Climate Change (UNFCCC) – as updated, including The Paris Agreement (2016), The Cancun Agreement (2011) and Kyoto Agreement (1997)

United Nations (2002) Commitments arising from the World Summit on Sustainable Development, Johannesburg

United Nations Economic Commission for Europe (1998) Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

National

Canal & River Trust (2015) Living Waterways Transform Places & Enrich Lives: Our 10 Year Strategy

Canal and River Trust (2015) Water Resources Strategy 2015 – 2020

Conservation of Habitats and Species Regulations 2010 Conservation of Habitats and Species Regulations 2010 (as amended by the Conservation of Habitats and Species (Amendment) Regulations 2017)

Defra (2004) Rural Strategy 2004

Defra (2005) Making Space for Water

Defra (2005) Securing the Future; Delivering UK Sustainable Development Strategy

Defra (2008), England Biodiversity Strategy –climate change adaptation principles

Defra (2009) Safeguarding our Soils – A Strategy for England

Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network

Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services

Defra (2011) Future Water: The Government's water strategy for England

Defra (2011) Future Water: The Government's water strategy for England

Defra (2011) Government Review of Waste Policy in England 2011

Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper

Defra (2011) UK National Ecosystem Assessment and Defra (2014) UK National Ecosystems Assessment Follow on, Synthesis of Key Findings

Defra (2011) Water for Life - Water White Paper

Defra (2015) The Great Britain Invasive Non-native Species Strategy

Defra (2018) The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting 2018-2023

Defra (2019) Clean Air Strategy 2019

Defra (2020) Enabling a Natural Capital Approach (ENCA)

Defra and Welsh Government (2014) River Basin Planning Guidance

Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living

Department for Business, Energy and Industrial Strategy (2020) Energy White Paper

Department for Culture, Media and Sport (2001) The Historic Environment – A Force for the Future (2001)

Department for Energy and Climate Change (2020) Energy White Paper: Powering our Net Zero Future

Environment Agency (2009) Water Resources Strategy for England and Wales

Environment Agency (2010) Water Resources Action Plan for England and Wales

Environment Agency (2013) Managing Water Abstraction

Environment Agency (2020) Meeting our future water needs: a national framework for water resources

Environment Agency (2020) National Flood and Coastal Erosion Risk Management Strategy for England

Environment Agency (2020) Water Company Drought Plan guideline

Environment Agency (undated) Hydroecology: Integration for modern regulation

Environment Agency (undated) WFD River Basin Characterisation Project

Environment Agency CAMS (various dates for relevant water catchments)

Environment Agency, OfWAT and Natural Resources Wales (2020) Water Resources Planning Guideline Draft for consultation – July 2020, and Technical Supplementary Guidance

Environment Agency (2021) Anglian River Basin District Draft Flood Risk Management Plan 2021-2027

Environmental Protection Act (1990)

Flood and Water Management Act (2010)

Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment

Historic England (2015) The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning

Historic England (2021) Heritage at Risk

HM Government (2013) The Bathing Water Regulations 2013

HM Government (2016) National Infrastructure Delivery Plan 2016-2021

HM Government (2016) The Groundwater (Water Framework Directive) (England) Direction 2016

HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment

HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment – Priority Outcome 1 (PO1): Environment

HM Government (2020) Energy white paper: Powering our net zero future

HM Government (2020) The Waste (Circular Economy) (Amendment) Regulations 2020

HM Government (2021) Environment Act 2021

HM Government (2021) Net Zero Strategy: Build Back Greener

HM Treasury Infrastructure UK (2014) National Infrastructure Plan

Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework

Natural England's standing advice on protected species.

Natural Environment and Rural Communities Act 2006

Planning (Listed Buildings and Conservation Areas) Act 1990

Salmon and Freshwater Fisheries Act 1975

The Climate Change Act 2008 (as amended)

The Countryside and Rights of Way (CRoW) Act (2000)

The Eels (England and Wales) Regulations 2009 (as amended)

The Energy Act 2013

The Environmental Damage (Prevention and Remediation) (England) Regulations 2015

The Natural Environment and Rural Communities (NERC) Act (2006)

The Water Act (2003)

The Water Environment (Water Framework Directive) Regulations (England and Wales) 2017

UKCIP (2018) UK Climate Projections UKCP18 (2018)

UKTAG WFD Guidance Documents (various dates)

Water Resources Act (1991) (as amended)

Wildlife and Countryside Act 1981 (as amended)

Regional

Cambridge and Peterborough City Council's Local Priority Species List

Cambridge City Council (2003) Cambridge Landscape Character Assessment

Cambridge City Council (2011) Cambridgeshire green infrastructure strategy

Cambridge City Council (2011) Cambridgeshire green infrastructure strategy

Cambridge City Council (2014) Anti-Poverty Strategy 2014-2017

Cambridge City Council (2015) Environment Policy Statement

Cambridge City Council (2018) Cambridge Local Plan

Cambridge City Council (2018) Cambridge Local Plan 2018

Cambridge City Council (2021) Biodiversity Strategy 2021-2030

Cambridge City Council (2022) Climate Change and Environment Strategy

Cambridge City Council, Huntingdonshire District Council, South Cambridgeshire District Council (2009) Air Quality Action Plan for the Cambridgeshire Growth Areas

Cambridge Water WRMP 2019

Cambridgeshire and Peterborough Minerals and Waste Local plan 2036 (2021)

Cambridgeshire County Council (2012) RECAP Waste Management Design Guide Supplementary Planning Document

Cambridgeshire County Council (2016) Cambridgeshire Flood and Water Supplementary Planning Document

Cambridgeshire County Council (2021) Cambridgeshire Local Flood Risk Management Strategy 2021-2027

Cambridgeshire County Council (n/a) Cambridgeshire Historic Environment Record (CHER)

Cambridgeshire Flood Risk Management Partnership (2014) Cambridgeshire Surface Water Management Plan, and detailed sub-plans

Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021

Defra (various dates) Climate Adaptation Reports for relevant water companies

East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015

Environment Agency (2011) Water Resources Strategy – A Regional Action Plan for Thames Region.

Environment Agency (2015) River Basin District River Basin Management Plans (Various)

Environment Agency and Defra (2015) Anglian River Basin District River Basin Management Plan

Environment Agency and Defra (2015) Humber River Basin District River Basin Management Plan

Environment Agency CAMS (various dates for relevant catchments)

Environment Agency Catchment Flood Management Plans (various)

Local Planning Authorities (various) Water Cycle Studies for housing growth points

Natural England - National Character Area (NCA) profiles

Natural England - National Character Area (NCA) profiles (various)

Natural England (2014) Site Improvement Plans (SIPs) for Natura 2000 Sites

Natural England National Character Area (NCA) Profiles

Peterborough City Council (2018) Biodiversity Strategy

Public Rights of Way Improvement Plans (ROWIPs)

South Cambridgeshire District Council (2009) Listed Buildings: Works to or affecting the setting of Supplementary Planning Document

South Cambridgeshire District Council (2009) Local Development Framework: Biodiversity Supplementary Planning Document

The Wildlife Trust for Bedfordshire, Cambridgeshire, Northamptonshire & Peterborough (2006) Cambridge City Nature Conservation Strategy "Enhancing Biodiversity"

Water companies 2014 Business Plan submissions to Ofwat (various)

Water companies Drought Plans (various) including Cambridge Water (2018) Final Drought Plan

Water companies WRMPs 2019 (various) including Cambridge Water (2019) Final WRMP

2.3 POLICY OBJECTIVES RELEVANT TO THE PLAN ASSESSMENT

The review of plans and programmes presented in **Appendix C** has identified a number of objectives and policy messages relevant to the draft WRMP. Reflecting the topics identified in Schedule 2 of the SEA regulations, these objectives and messages are set out for the following topic areas:

- Biodiversity, Flora and Fauna;
- Geology Land use and Soils;
- Water (including flood risk);

- Air Quality;
- Climatic Factors;
- Population and Human Health;
- Material Assets and Resource Use;
- Cultural Heritage; and
- Landscape.

The policy objectives and messages identified from the review of other plans and programmes are summarised in **Table 2.2**. It is important that the assessment takes these into account as this will help to highlight any areas where the draft plan will help or hinder the achievement of the objectives of the other plans. Only the key sources are included; however, it is acknowledged that many other plans and programmes could also be included. The relevance of the key objectives and policy measures to the assessment of the WRMP is also indicated in **Table 2.2**.

Table 2.2 Key Policy Objectives Identified in Other Plans and Programmes relevant to the Assessment of the WRMP

Key Policy Objectives and Policy Messages	Key Sources	Relevant to the SEA of the WRMP?
Biodiversity, Flora and Fauna		
Conservation and enhancement of the levels and variety of biodiversity, including designated sites, priority species and habitats	Birds Directive; Fresh Water Fish Directive; Directive on Animal health requirements; WFD Directive; EU Biodiversity strategy to 2030; EC Blueprint to Safeguard Europe's Water Resources; Ramsar Convention on Wetlands; Bonn Convention; Bern Convention; Convention on Biological Diversity; SEA Directive; 8th Environmental Action Programme; A Green Future; Conservation of Habitats and Species regulations; National Policy Planning Framework; Water for Life; Natural Environment White Paper; Biodiversity 2020; Making Space for Nature; UK National Ecosystem Assessment and DEFRA; Enabling a Natural capital Approach; GB Invasive Non-native species strategy; England biodiversity strategy; Hydro-ecology; WFD River Basin Characterisation Project; EA CAMS; Natural England's standing advice on protected species; Natural Environment and Rural Communities Act; Salmon and Freshwater Fisheries Act; CRoW Act; Environmental Protection Act; Water Environment (WFD) Regulations; Cambridge Biodiversity Strategy; Peterborough Biodiversity Strategy; Cambridge and Peterborough Local Priority Species List; Humber River Basin District River Basin Management Plan; Anglian River Basin District River Basin Management Plan; Site Improvement Plans; NCA Profiles; Cambridge City Nature Conservation Strategy; South Cambridgeshire - Local Development Framework; Cambridgeshire Vision – Sustainable Community strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Soils, Land Use and Geology		
Protection and enhancement of soil quality, promoting sustainable patterns of land use and protecting designated geological features	European Soils Charter; Thematic Strategy for Soil Protection; SEA Directive; 8th Environmental Action Programme; CRoW Act; A green future; Safeguarding our Soils; National Policy Framework; Rural Strategy; Environmental Protection Act; Wildlife and Countryside Act; NCA Profiles; Anglian River Basin Management Plan; Cambridgeshire Vision; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Water (including flood risk)		
Protection and enhancement of all water supplies and resources	Water Framework Directive; Drinking Water Directive; Environmental Liability Directive; Groundwater Directive; Bathing Water Quality Directive; Urban Waster Water Treatment Directive; Nitrates Directive; SEA Directive; 8th Environmental Action Programme; National Planning Policy Framework; Making Space for Water; Bathing Water	Yes

Key Policy Objectives and Policy Messages	Key Sources	Relevant to the SEA of the WRMP?
	Regulations; Environment Act; Groundwater Direction; A Green Future; Water for Life; Natural Choice; Future Water; Meeting our future water needs; National Flood and Coastal Erosion Risk Management Strategy for England; Water Company Drought Plan Guideline; Water Resources Planning Guideline Draft for consultation; Water Resources Action Plan; Water Resources Strategy; Managing Water Abstraction; Flood and Water Management Act; Water Act; Water Environment Regulations; UKTAG WFD Guidance; Water Resources Act; Environmental Protection Act; Living Waterways Transform Places & Enrich Lives; Canal and River Trust Water resources Strategy; River Basin District Management Plan (Various); Anglian River Basin Management Plan; EA CAMS; Catchment Flood Management Plans; Water resources Strategy; Water Company WRMPs (Various); Water companies 2014 Business Plan; Water Company Drought Plans; Cambridgeshire Local Flood Risk Management Strategy; Cambridgeshire Surface Water Management Plan; Cambridgeshire Flood and Water Supplementary Planning Document; Cambridgeshire Vision; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	
Promoting the sustainable and efficient use of water	Water Framework Directive; Drinking Water Directive; Environmental Liability Directive; Groundwater Directive; Bathing Water Quality Directive; Urban Waster Water Treatment Directive; Nitrates Directive; SEA Directive; 8th Environmental Action Programme; National Planning Policy Framework; Making Space for Water; Bathing Water Regulations; Environment Act; Groundwater Direction; A Green Future; Water for Life; Natural Choice; Future Water; Meeting our future water needs; Water Company Drought Plan Guideline; Water Resources Planning Guideline Draft for consultation; Water Resources Action Plan; Water Resources Strategy; Managing Water Abstraction; UKTAG WFD Guidance; Water Resources Act; Environmental Protection Act; Living Waterways Transform Places & Enrich Lives; Canal and River Trust Water resources Strategy; River Basin District Management Plan (Various); Anglian River Basin Management Plan; EA CAMS; Catchment Flood Management Plans; Water resources Strategy; Water Company WRMPs (Various); Water companies 2014 Business Plan; Water Company Drought Plans; Cambridgeshire Surface Water Management Plan; Cambridgeshire Flood and Water Supplementary Planning Document; Cambridgeshire Vision; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Minimising flood risk and improving flood control infrastructure	Floods Directive; Water Framework Directive; Flood and Water Management Act; Water Act; National Flood and Coastal Erosion Risk Management Strategy for England;; National Planning Policy Framework; Shoreline Management Plans (various); Cambridgeshire Local Flood Risk Management Strategy; Catchment Flood Management Plans (various); River Basin Management Plans (various); Draft River Basin Management Plans (Various); Catchment Flood Management Plans (various); Local Planning Authority Local Plans (various); Anglian Flood Risk Management Plan	Yes
Air		
Ensuring air quality is maintained or enhanced and that emissions of air pollutants are kept to a minimum	Ambient Air Quality and Cleaner Air for Europe; Thematic Strategy on Air Pollution; SEA Directive; national Planning Policy Framework; Environment Act; A Green Future; Clean Air Strategy; Air Quality Action Plan for the Cambridgeshire Growth Areas; Climate Change and Environment Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Climatic Factors		
Minimising emissions of greenhouse gases that cause climate change	Kyoto Protocol; Paris Agreement; Climate Change Act; Renewable Energy Roadmap; SEA Directive; Promotion of the use of energy from renewable sources; National Adaptation Programme; National	Yes

Key Policy Objectives and Policy Messages	Key Sources	Relevant to the SEA of the WRMP?
	Planning Policy Framework; Environment Act; A Green Future; Energy White Paper; Powering our Net Zero Future; Clean Air Strategy; Climate Change Act; Energy Act; UK Climate Projections; Build Back Greener; Climate Adaptation Reports for water companies; Cambridge Climate Change and Environment Strategy; Climate Change and Environment Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	
Minimising the effects of climate change on natural resources, inhabitants and the economy	Kyoto Protocol; Paris Agreement; Climate Change Act; Renewable Energy Roadmap; SEA Directive; Promotion of the use of energy from renewable sources; National Adaptation Programme; National Planning Policy Framework; Environment Act; A Green Future; Energy White Paper; England Biodiversity Strategy; The Energy Act; Powering our Net Zero Future; Clean Air Strategy; UK Climate Projections; Climate Change Act; Build Back Greener; Climate Adaptation Reports for water companies; Cambridge Climate Change and Environment Strategy; Climate Change and Environment Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Population and Human Health		
Addressing deprivation and reducing inequality	8th Environmental Action Programme; SEA Directive; Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters; The Natural Choice; Clean Air Strategy; Securing the Future; Creating a Great Place for Living; National Planning Policy Framework; NERC Act; A Green Future; Anti-Poverty Strategy; Cambridgeshire Vision – Countywide Sustainable Community Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement	Yes
Promoting improvements to health and well-being	Drinking Water Directive; Blueprint to Safeguard Europe's Water Resources; 8th Environmental Action Programme; Environment Noise Directive; Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters; SEA Directive; National Infrastructure Plan; National Infrastructure Delivery Plan; CRoW Act; Water for Life; Clean Air Strategy; Securing the Future; Creating a great place for living; National Planning Policy Framework; NERC Act; A Green Future; Water Cycle Studies for Housing Growth Points; ROWIPs; Anti-Poverty Strategy; Cambridgeshire Vision – Countywide Sustainable Community Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement	Yes
Providing high quality services, community facilities and social infrastructure that is accessible to all	Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters; National Planning Policy Framework; SEA Directive; National Infrastructure Plan; National Infrastructure Delivery Plan; Crow Act; Water for Life; Clean Air Strategy; Natural Choice; Securing the Future; Creating a Great place for living; NERC Act; A Green Future; ROWIPs; Cambridgeshire Vision – Countywide Sustainable Community Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement	No
Achieving sustainable economic growth and promoting key sectors in the local economy	SEA Directive; The Natural Choice; Securing the Future; National Planning Policy Framework; A Green Future; Cambridgeshire Vision – Countywide Sustainable Community Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Improving and expanding the tourism economy	National Planning Policy Framework; Securing the Future; PROWIPs; CRoW Act; Local Planning Authority Local Plans (various); A Green Future; Cambridgeshire Vision – Countywide Sustainable Community Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan;	Yes

Key Policy Objectives and Policy Messages	Key Sources	Relevant to the SEA of the WRMP?
	Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	
Maximising job opportunities for all and enhancing the quality of employment opportunities	National Planning Policy Framework; Securing the Future; PROWIPs; CRoW Act; Local Planning Authority Local Plans (various); A Green Future; Cambridgeshire Vision – Countywide Sustainable Community Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Minimising noise pollution	Environment Noise Directive; National Planning Policy Framework; SEA Directive	Yes
Promoting sustainable transport	SEA Directive; The Natural Choice; Securing the Future; National Planning Policy Framework; A Green Future; Cambridgeshire Vision – Countywide Sustainable Community Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	No
Material Assets and Resource Use		
Minimising waste production, promoting re-use and recycling	Environmental Action Programme; Waste Framework Directive; Landfill of Waste Directive; Waste Regulations; National Waste Policy; National Planning Policy Framework; Environment Act; Environmental Protection Act; Cambridgeshire and Peterborough Minerals and Waste Local plan; Waste Management Design Guide Supplementary Planning Document	Yes
Promoting the most effective and efficient use of natural resources	World Summit on Sustainable Development; Eighth Environmental Action Programme; A Green Future; National Planning Policy for Waste; Environment Act; Environmental Protection Act; National Infrastructure Plan; Energy White Paper; Meeting our future water needs; Net Zero Strategy; Cambridge Water WRMP19; Cambridgeshire and Peterborough Minerals and Waste Local plan; Waste Management Design Guide Supplementary Planning Document; Cambridgeshire Vision – Countywide Sustainable Community Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Promoting the use of sustainable/renewable energy	World Summit on Sustainable Development; Eighth Environmental Action Programme; A Green Future; National Planning Policy for Waste; Environment Act; National Infrastructure Plan; National Infrastructure Delivery Plan; Energy White Paper; Net Zero Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Promoting the use of sustainable design and construction and encouraging energy efficiency	World Summit on Sustainable Development; Energy Efficiency Directive; National Planning Policy Framework; Eighth Environmental Action Programme; A Green Future; National Planning Policy for Waste; Environment Act; National Infrastructure Plan; National Infrastructure Delivery Plan; Energy White Paper; Net Zero Strategy; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes
Cultural Heritage		
Protecting and enhancing cultural heritage and archaeological sites	Convention for the Protection of the Architectural Heritage of Europe; Convention on Protection or Archaeological Heritage; World Heritage Convention; SEA Directive; 8th Environmental Action Programme; Guidance on Heritage Impact Assessments; World Heritage Advice Note; Convention on Protection of Underwater Cultural Heritage; National Planning Policy Framework; Historic Environment – Force for the Future; Heritage at Risk; SEA, Sustainability Appraisal and the Historic Environment; Setting of Heritage Assets; Planning Act; Cambridgeshire Historic Environment Record; Listed Buildings; Cambridge Local Plan; East Cambridgeshire Local Plan;	Yes

Key Policy Objectives and Policy Messages	Key Sources	Relevant to the SEA of the WRMP?
	Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	
Landscape		
Protecting and enhancing the quality and distinctiveness of natural landscapes and environmental resources	European Landscape Convention; SEA Directive; National Planning Policy Framework; A Green Future; Natural Choice; Making Space for Nature; CRoW Act; Wildlife and Countryside Act; NCA Profiles; Cambridge Landscape Character Assessment; Cambridge Local Plan; East Cambridgeshire Local Plan; Cambridgeshire Green Infrastructure Strategy; Cambridge CC Environment Policy Statement.	Yes

3. BASELINE ANALYSIS

3.1 INTRODUCTION

Schedule 2 of the SEA Regulations require the completion of an Environmental Report that contains:

"*The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme*" (Schedule 2(2));

"*The environmental characteristics of areas likely to be significantly affected"* (Schedule 2(3)); and

"*Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds(1) and the Habitats Directive"*, (Schedule 2(4)).

Appendix D of this Environmental Report identifies and characterises current environmental baseline conditions, along with their likely evolution. Only with a knowledge of existing conditions, and a consideration of their likely evolution, can the effects of the draft WRMP24 be identified, described and assessed and its subsequent success or otherwise be monitored. This is also useful in determining the key issues for each topic that should be taken forward in the SEA, through the SEA objectives and guide questions.

The analysis of baseline information is presented for the following topics:

- Biodiversity, Flora and Fauna;
- Geology Land use and Soils;
- Water (including flood risk);
- Air Quality;
- Climatic Factors;
- Population and Human Health;
- Material Assets and Resource Use;
- Cultural Heritage; and
- Landscape.

Each topic includes further sub-topics with information structured according to the following:

- Baseline Characteristics;
- Likely Evolution of the Baseline without the Plan;
- Key Issues Relevant to the Assessment of the Plan.

The data has been drawn from a variety of sources, such as the water companies themselves, the Office for National Statistics (ONS), government departments (such as BEIS, Defra and DLUHC), regulators (such as NRW, NE and the EA) and a number of the plans and programmes reviewed as part of the SEA process (see **Section 2** of this report and **Appendices C and D**).

3.2 SUMMARY OF THE KEY ISSUES

Table 3.1 Summary of Key Issues

Topic	Summary of Key Issues	SEA Objectives link (see Section 4
Biodiversity Flora and Fauna	Relevance The construction of water resources infrastructure can affect biodiversity and ecosystem resilience. Impacts may be direct (for example, the loss of, or damage to, habitats and species) or indirect (for example,	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology

Topic	Summary of Key Issues	SEA Objectives link (see Section 4
	disturbance due to noise and emissions to air associated with construction works). The operation of water resources infrastructure can have a range of positive and negative impacts on habitats and species and wider ecosystem resilience due to, for example, changes in hydrology, changes in water chemistry and the spread of invasive non-native species. Water infrastructure can contribute positively to biodiversity, introducing new features that can provide opportunities for nature and wildlife in the medium to long term. Discharges associated with the construction and operation of water resources infrastructure e.g., desalination can adversely affect marine habitats. <u>Key Issues</u> Key pressures and risks in respect of biodiversity and nature conservation that are relevant include, inter-alia: • The need to protect or enhance the region's biodiversity, particularly protected sites designated for nature conservation and rare and valuable habitat such as chalk streams. • The need to avoid activities likely to cause irreversible damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors. • The need to recognise the importance of allowing wildlife to adapt to climate change. • The need to control the spread of Invasive Non-Native Species (INNS). • 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 ecosystem services.	Objective 5: Water Quality Objective 6: Water Quantity Objective 7: Flood Risk Objective 10: Climatic Factors
Soils, Land Use and Geology	<u>Relevance</u> Soils are a non-renewable resource vulnerable to changes in both hydrology and land use. Hydrogeology will affect the distribution and movement of groundwater and surface water and is a key consideration for water resources planning. The construction of water resources infrastructure can affect land use and soil. Impacts may be direct (for example, the loss of, or damage to, land and soil from new development) or indirect (for example, the location of new infrastructure affecting adjacent land uses). The appropriate management and control of soils and sediments that are excavated, moved and/or stored during construction is key to their long-term sustainability. <u>Key Issues</u> • The need to protect geological features of importance and maintain and enhance soil function and health. • The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).	Objective 1: Biodiversity Objective 4: Soil, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity

Topic	Summary of Key Issues	SEA Objectives link (see Section 4
	• The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region	
Water - Quantity	Relevance There is growing pressure on water resources in parts of the UK, particularly the south east and east of England with proposals to meet the demand from other parts of the country including WRW. The construction of water resources infrastructure would be expected to increase the volume and resilience of the water supply. The volume and flow of water significantly affects ecological functioning and the broader environment and can be affected (potentially positively or negatively) by water resources infrastructure through, for example, changes in supply and abstraction. Key Issues • The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives. • 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 water and groundwater. • 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.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 11: Economy Objective 13: Human Health
Water - Quality	Relevance Reliable access to water of good quality is an essential aspect of water resources planning. The construction of water resources infrastructure would be expected to help ensure a robust future supply of good quality water in a changing climate. The construction and operation of water resources infrastructure can have adverse impacts on water quality due to, for example, pollution. The operation of water resources infrastructure can have both positive and negative impacts on water quality associated with, in particular, changes to water levels as a result of abstraction or discharge. This in-turn can affect the resilience of ecosystems. The historic pollution of groundwater and nitrate concentrations present an issue for water resources infrastructure and ensuring drinking water standards are met. Key Issues • The need to further improve the quality of the regions' river and estuarine waters taking into account WFD objectives. • 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.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 11: Economy Objective 13: Human Health

Topic	Summary of Key Issues	SEA Objectives link (see Section 4
Water - Flood Risk	Relevance Flood risk presents a significant planning issue in the development of major infrastructure projects, both in terms of the infrastructure itself being flooded during its construction and operational phases and the changes to flood risk resulting from the infrastructure, such as increased run-off raising the flood risk in downstream areas. The operation of water resources infrastructure (e.g., reservoirs) may provide an opportunity to address flood risk issues (for example, by providing extra space for flood water storage). Key Issues • 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 water and groundwater. • The need to reduce and manage flood risk.	Objective 5: Water Quality Objective 6: Water Quantity Objective 7: Flood Risk Objective 10: Climatic Factors Objective 11: Economy Objective 13: Human Health
Air Quality	Relevance Air quality is sensitive to changes in traffic volume and emissions from other sources such as construction plant and machinery. Increases in transport movements and works associated with the construction and operation of nationally significant water resources infrastructure could affect air quality, particularly in areas with existing air quality issues. For example, construction traffic can lead to increased nitrate deposition in sensitive habitats. Key Issues • The need to minimise emissions of pollutant gases and particulates and enhance air quality; • The need to reduce greenhouse gas emissions arising from implementation of the WRMP;	Objective 1: Biodiversity Objective 4: Soil, Land Use and Geology and Soils Objective 5: Water Quality Objective 6: Water Quantity Objective 8: Air Quality Objective 13: Human Health
Climatic Factors	Relevance The availability of additional water supplies can increase the resilience of the existing water network and broader environment and support adaptation to the effects of climate change such as drought. The construction and operation of water resources infrastructure is likely to result in a net increase in energy use and greenhouse gas emissions, noting however that new infrastructure may replace older, less energy efficient infrastructure with higher emissions. The energy requirements associated with different types of water resources infrastructure will vary with the scope for the use of renewable energy greater for certain infrastructure types than for others. Water resources infrastructure may be vulnerable to the effects of climate change such as flood risk and coastal change. Key Issues • The need to minimise emissions of pollutant gases and particulates and enhance air quality; • 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;	Objective 1: Biodiversity Objective 5: Water Quality Objective 6: Water Quantity Objective 7: Flood Risk Objective 9: Greenhouse Gases Objective 10: Climatic Factors Objective 13: Human Health

Topic	Summary of Key Issues	SEA Objectives link (see Section 4
	• The need to increase environmental resilience to the effects of climate change.	
Population	Relevance The growing population within the Cambridge and WRW area will increase the demand for water resources. Long-term growth of the economy would be expected to lead to an increase in demand for water for commercial and industrial purposes. In turn, the risk of drought or interruptions to accessing water may pose a risk to economic productivity. The construction of large-scale water resources infrastructure can represent a significant capital investment with the potential to create employment opportunities, deliver supply chain benefits and contribute to skills development in the working population. The operation of water resources infrastructure can support long term socio-economic growth by ensuring sufficient supplies of water are made available to meet demand. The affordability of water, protection of vulnerable customers and delivering best value for money is a key consideration in water company investment decisions. The construction and operation of water resources infrastructure can adversely affect businesses and communities, principally due to disruption. Consumer preference and consumer behaviour can have a strong influence on the demand for water resources. Key Issues • The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water and sewerage services 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 ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population. • The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment. • The need to accommodate an increasing population. • 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 well-being and the economy.	Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 14. Water Resources Objective 15. Waste and Resource Use
Human Health	Relevance	Objective 11. Economy

Topic	Summary of Key Issues	SEA Objectives link (see Section 4
	A reliable source of clean water is required for basic sanitation and to ensure human health. The increase in the severity of drought, particularly in the south and east of England, poses a risk to health. The detection and removal of chemicals in the drinking water supply, or in treated waste water returned to the environment, is an important aspect of maintaining a wholesome water supply. Certain aspects of water resources infrastructure, such as reservoirs, can provide valuable recreational opportunities, both for water sports and for users of the associated land such as walkers and cyclists. The construction and operation of water resources infrastructure can have adverse effects on human health for example, due to noise disturbance or loss of open space. <u>Key Issues</u> • The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas. • The need to ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population.	Objective 12. Tourism and Recreation Objective 13. Human Health
Material Assets	<u>Relevance</u> Large scale infrastructure projects have the potential to generate very high volumes of waste during both construction and operation. This waste should be managed in accordance with the waste hierarchy. Large scale water resources infrastructure may require both short-term (i.e. during construction) and long-term (i.e. during operation) use of materials that are non-renewable or are imported. In doing, so schemes may have an environmental impact that extends outside the water company operational area. <u>Key Issues</u> • The need to minimise the consumption of resources, including water and energy. • The need to reduce the total amount of waste (from all sources) produced in the region, promote recycling and reduce the proportion of waste sent to landfill • The need to recognise waste as a potential resource and reuse waste productively where possible to support development of the circular economy. • The need to continue to reduce leakage from the water supply system • Promote the efficient use of water to help reduce future demand for water. • The need to support regional and national commitments to decarbonisation.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 9: Greenhouse Gases Objective 10: Climatic Factors Objective 11. Economy Objective 14. Water Resources Objective 15. Waste and Resource Use
Cultural Heritage	<u>Relevance</u> Wetlands are fragile and vulnerable to subtle changes arising from development that can affect paleoenvironmental deposits and archaeological assets. Other aspects of the wider historic environment	Objective 4: Soils, Land Use and Geology

Topic	Summary of Key Issues	SEA Objectives link (see Section 4
	that could be affected include disruption to historically important water sources, the flooding or drying of deep archaeological sites and assets such as mills and bridges which can be affected by local water levels. The construction and operation of large-scale water resources infrastructure can have adverse impacts on the significance of heritage assets and archaeological remains both directly (through the loss of, or damage to, assets) or indirectly (through effects on setting). Cultural landscape is a function of the interaction between human traditions, landscape and the environment and is a highly valued feature of some areas such as National Parks. Existing water resources infrastructure including, for example, pumping stations and reservoirs can be historically important in their own right. <u>Key Issues</u> • The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their settings, particularly those which are sensitive to the water environment. • The need to protect water-dependent heritage sites during drought conditions.	Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 16: Cultural Heritage Objective 17: Landscape
Landscape	<u>Relevance</u> The construction and operation of water resources infrastructure can have adverse impacts on landscape character, visual amenity and tranquillity. Where works are located in areas of high landscape value (for example, National Parks), these effects could be significant. Water infrastructure can also contribute positively to landscapes, introducing new features that can provide opportunities for nature and wildlife in the medium to long term. <u>Key Issues</u> • The need to protect and improve the natural beauty of the region's National Parks and other landscapes of natural beauty. • The need to protect and improve the character of landscapes and townscapes.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 16: Cultural Heritage Objective 17: Landscape and Townscape

3.3 LIMITATIONS OF THE DATA AND ASSUMPTIONS MADE

The information used has been sourced, so far as is possible, from recent datasets utilising a wide range of authoritative and official sources. It is important to acknowledge that there are variable time lags between raw data collection and its publication. Consequently, at the time of this Scoping Report's publication, the baseline or predicted future trends may have varied from those described above.

The data gathered to complete this baseline pre-dates the Covid-19 pandemic and its environmental, social and economic effects. Data that relates to these changes is only becoming available periodically and it may well be a number of years before the effects of the pandemic can be determined, along with whether changes to the topics covered in the baseline have been short-term or sustained. This is an additional uncertainty within the assessment, and where relevant, some qualitative commentary may be provided.

4. APPROACH TO THE ASSESSMENT

4.1 INTRODUCTION

This section describes the approach to the assessment of the draft WRMP24. It draws on the information contained in **Sections 2 and 3**, as well as the more detailed information contained in **Appendices C and D**, to define the scope of the assessment (in terms of the environmental and socio-economic issues to be considered) and sets out the SEA objectives and guide questions that comprise the assessment framework. The section then outlines how this assessment framework will be used to assess the options contained in the draft WRMP24.

4.2 THE SCOPE OF THE ASSESSMENT

4.2.1 Topics

The aim of SEA is to identify, describe and evaluate the likely significant effects of implementing the draft WRMP24 on the environment. Schedule 2 of the SEA Regulations require that the assessment includes information on the "*likely significant effects on the environment, including on issues such as: biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage, including architectural and archaeological heritage; landscape; and the inter-relationship between the issues referred to*".

The key policy objectives identified from the review of other plans and programmes relevant to the assessment of the draft WRMP24 (Section 2) and the key economic, social and environmental issues arising from the analysis of the baseline (Section 3), together with the characteristics of the water resource management options, have been used to define the scope of the assessment in terms of the topics set out in Schedule 2 of the SEA Regulations.

In this instance, all SEA topics identified by Schedule 2 of the SEA Regulations have been scoped in for assessment.

4.2.2 Geographic Scope

The geographic extent of the SEA reflects the operational area covered by the draft WRMP24. It includes all WRZs, as each is forecast to be in deficit over the lifetime of the plan. The SEA will focus on the effects associated with the water resource management options being proposed to address the deficit.

In considering the adverse operational effects on European sites, and reflecting the approach taken in the HRA, a 10km study area from each option component has been used plus exceptional, longer impact pathways e.g., downstream receptors, coastal dispersion, foraging areas for mobile species.

Where water resource options include transfers and potential water trading options between companies, where appropriate further consideration has been given to the effects outside the operational area of the draft WRMP24. This also extends to the assessment of cumulative effects, where consideration of plans or programmes that cover areas that either overlap or are adjacent to the plan being assessed have also been taken into account.

4.2.3 Timescales

When considering the timing of potential effects of the draft WRMP24, the assessment has classified effects as 'short,' 'medium' or 'long-term.' This reflects an intention to capture the differences that could arise at different timescales, consistent with the requirements of Schedule 1 (2)(a) of the SEA Regulations where the assessment of the effects should have regard to "*the probability, duration, frequency and reversibility of the effects*".

Table 4.1 below summarises the timescales applied in the SEA informed by the 5-year cycle of review of the plan. For the purposes of this assessment, short-term is considered as up to 1 year, medium-term (from 1 year to 5 years (to the end of the plan review cycle)) and long-term is for the period beyond 5 years (beyond the plan review cycle).

Table 4.1 Duration of Short, Medium and Long Term

Estimated Length (years)	Duration
0-1 years	Short
>1-5 years	Medium
Over 5 years	Long

4.3 ASSESSMENT FRAMEWORK

Establishing appropriate SEA objectives and guide questions is central to assessing the effects of the draft WRMP24 on the environment. Each of the revised feasible water resource management options and preferred options has been assessed against the SEA objectives to determine the scale and significance of the effect. Guide questions focus the assessment on specific aspects of the objective that reflect issues identified from the review of baseline and contextual information relating to Cambridge Water's WRMP24 area.

The SEA objectives and guide questions used in the assessment of the draft WRMP24 reflect the topics contained in Schedule 2 (6) of the SEA regulations and have been informed by:

- the previous SEA assessment frameworks used to complete the SEA of CW and SSW WRMP19s;
- the suggested core set of objectives in the All Company Working Group (ACWG) 2020 report 'Strategic Environmental Assessment: Core Objective Identification';
- the review of relevant plans and programmes and the associated key policy objectives and messages (**Section 3** and **Appendix C**);
- the baseline information and key issues contained in **Section 4** and **Appendix D**;
- the draft assessment framework presented in the WRW and draft WRMPs SEA Scoping Report, issued for scoping consultation in April 2021.
- scoping consultation responses received from (**Appendix B**).

The assessment framework is presented in **Table 4.2**. It contains 17 assessment objectives. It has been revised to reflect the scoping consultations responses and has been used to completion of the assessment of Cambridge Water's draft WRMP24.

Table 4.2 Assessment Framework

Topic	Proposed Objective	Proposed Guide Questions
Biodiversity, Flora and Fauna	1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	• Will it protect, restore 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)? • Will it protect, restore and enhance non-designated sites and local biodiversity? • Will it provide opportunities for new terrestrial and aquatic habitat creation or restoration and/or link existing habitats as part of the development process? • Will it provide opportunities to deliver biodiversity net gain? • Will it lead to a change in the ecological quality of habitats? • Will it protect, restore and enhance where appropriate, coastal and marine habitats and species? • Will it maintain and enhance the green infrastructure network and the biodiversity it supports?

Topic	Proposed Objective	Proposed Guide Questions
		• Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems?
	2. To protect and enhance sustainable natural resources and the ecosystem services they provide.	• Will it protect or enhance natural capital and ecosystem services? • Will it maintain and enhance ecosystem resilience? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e., within their limits and capacities taking into account climate change adaptability? • Will it provide opportunities for climate adaptation and protect the climate resilience of vulnerable and priority sites
	3. To avoid and minimise the risk of spread of and, where required, manage invasive and non-native species (INNS).	• Will it prevent or minimise the risk of spread/introduction of invasive and non-native species? • Will it contribute to the eradication of invasive and non-native species, where they are already present and it is technically and economically feasible to do so?
Soils, Land Use and Geology	4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.	• 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? • Will it avoid damage to, protect and enhance where possible protected sites designated for their geological interest (GCR sites, SSSI and RIGS) and features of wider geodiversity interest? • Will it minimise the loss of best and most versatile agricultural land? • Will it minimise land contamination? • Will it ensure efficient use of land (e.g., make use of previously developed land)? • Will it contribute towards a catchment-wide approach to land management? • Will it avoid adverse effects on other land uses (such as forestry)?
Water – Quantity	5. To protect and enhance surface and ground water levels and flows.	• Will it minimise the demand for water resources? • Will it result in changes to river flows, channel morphologies, wetted width or river levels? • Will it result in changes to groundwater levels? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will it alter the flow regime of surface waters?
Water – Quality	6. To protect and enhance the quality of surface and groundwater resources.	• Will it prevent pollution and protect and improve surface, groundwater, estuarine and coastal water quality? • Will it prevent the deterioration of Water Framework Directive (WFD) waterbody status (or potential)? • Will it support the achievement of WFD protected area objectives? • Will it ensure a new activity or new physical modification does not prevent the future achievement of good status for a water body? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will the option prevent nutrient loading in water bodies?
Water – Flood Risk	7. To reduce or manage flood risk.	• Will the option be at risk of flooding now or in the future?

Topic	Proposed Objective	Proposed Guide Questions
		• Will it have the potential to cause or exacerbate flooding in the catchment area including the risks to people and property, now or in the future? • Will it have the potential to help alleviate or mitigate flooding in the catchment area including to people and property now or in the future? E.g., will it avoid reducing flood plain storage, or provide opportunities to improve flood risk management? • Will it promote the use of sustainable drainage systems? • Will it promote opportunities for collaborative working with other risk management authorities?
Air	8. To minimise emissions of pollutant gases and particulates and enhance air quality.	• Will it maintain or enhance ambient air quality, keeping pollution below Local Air Quality Management thresholds (e.g., in Air Quality Management Areas or sensitive habitats)?
Climatic Factors	9. To reduce greenhouse gas emissions.	• Will it reduce or minimise greenhouse gas emissions? • Will it have a low level of embodied carbon? • Will it provide new infrastructure that is energy efficient and/or minimizes the use of energy? • Will it provide new infrastructure that could contribute or make use of renewable energy sources? • Will the option affect carbon sequestration?
	10. To adapt and improve resilience to the threats of climate change.	• Will it improve resilience and/or adaptability to the likely effects of climate change, e.g., by increasing resilience of water supplies or catchments? • Will it increase environmental resilience to the effects of climate change including to impacts on flood risk and water quality? • Will coastal erosion have consequences on the operation of this option now or in the future, taking account of expected climate change sea level rise?
Population	11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	• Will it ensure that sufficient water resources infrastructure is in place to support predicted population increases? • Will it ensure sufficient infrastructure is in place to sustain a seasonal influx of tourists? • Will it help to meet the employment needs of local people? • Will it ensure that an affordable supply of water is maintained, and vulnerable customers protected? • Will it contribute to sustaining and growing the local and regional economy? • Will it avoid disruption through effects on the transport network? • Will it avoid negative effects on built assets/ existing infrastructure including transport?
	12. To maintain and enhance tourism and recreation.	• Will it protect and enhance public access to, and enjoyment of, green and blue infrastructure, open space/recreational facilities and the natural and historic environment, and in doing so help promote healthy lifestyles including mental well-being?
Human Health	13. To protect and enhance human health and well-being.	• Will it ensure the continuity of a safe and secure drinking water supply? • Will it help to protect or improve drinking water quality? • Will it maintain surface water and bathing water quality within statutory standards? • Will it help to promote healthy communities and avoid risks to health and wellbeing (for example, due to noise resulting from

Topic	Proposed Objective	Proposed Guide Questions
		construction traffic or disruption to safe and reliable water/sewerage services)? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it be located in an area considered to be significantly more health deprived than others in the region? • Will it improve opportunities for social interaction and community cohesion?
Material Assets - Water Resources	14. To promote and enhance the sustainable and efficient use of resilient water resources.	• Will it lead to reduced leakage from the supply network? • Will it improve efficiency in water consumption? • Will it ensure sustainable abstractions, taking account of water resource availability? • Will it enable efficient water resource management to help maintain a supply-demand balance? • Will it increase the resilience of water resources, now and into the future? • Will it contribute towards improving the awareness of water sustainability?
Material Assets – Waste and Resource Use	15. To minimise waste, promote resource efficiency and move towards a circular economy.	• Will it make use of existing infrastructure? • Will it promote the re-use and recycling of waste materials and reduce the proportion of waste sent to landfill? • Will it help to encourage sustainable design or use of sustainable materials (e.g., supplied from local resources)?
Cultural Heritage	16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	• Will it avoid damage to, conserve or enhance the historic environment, including heritage assets and their settings such as historic buildings, conservation areas, features, places and spaces, that enhance local distinctiveness? • Will it avoid or minimise damage to archaeologically important sites? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it avoid damage to important wetland areas with potential for paleoenvironmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region? • Will it protect or enhance (where relevant) Welsh language and culture?
Landscape	17. To conserve, protect and enhance landscape and townscape character and visual amenity.	• Will it avoid adverse effects to, and enhance where possible, protected/designated landscapes and the settings of designated landscapes (including woodlands) such as National Parks or AONBs? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g., woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it protect and enhance landscape character, townscape, seascape and green infrastructure? • Will it minimise adverse visual impacts?

4.4 ASSESSMENT METHODOLOGY

The effects of the draft WRMP24 have been assessed in a staged process, complementary to the development of the plans, and reflecting the decision-making requirements, as follows:

- **Revised feasible option assessment**: a high-level assessment of all revised feasible options (including resource management and demand management options) against the 17 SEA assessment objectives detailed in **Table 4.2** with findings used to inform the MCA (for plan decision making) and detailed screening of options (for the WRMPs).
- **Preferred option assessment**: for those options selected, a more detailed assessment has **been undertaken of the preferred plan options against the 17 SEA assessment objectives detailed in Table 4.2.**
- **Preferred programme assessment**: the cumulative effects of the preferred programme of options has been completed, to ensure that the effects of the draft Plan have been identified, described and evaluated.
- **Reasonable alternative plan assessments**: the cumulative effects of any reasonable alternative plans are identified, described and evaluated for consideration along with the preferred plan (*noting that no alternative programmes were identified).*

The approach to these is described in more detail below.

4.4.1 Feasible Options

Both the construction and operational effects of each feasible option have been assessed against all of the SEA objectives that comprise the assessment framework. This approach ensures a comprehensive consideration of any likely effects. It also recognises that the environmental effects are likely to be different in their nature, scale and significance during construction as opposed to their operation. For those options that would not require construction works per se and may be ongoing in nature (for example, the installation of water efficient devices, audits and educational programmes), construction in the context of the SEA refers to any enabling/installation works or option implementation.

The assessment of effects will include consideration of the following:

- 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 a water company area); and
- the potential effect on vulnerable communities or sensitive sites.

Where relevant, other information and assessments including the HRA and WFD Assessment have been referenced as appropriate. Where the assessment is of a revised WRMP19 option, the assessment will take into account, where appropriate, the previous assessment findings and any regulators and stakeholder feedback already received.

A matrix similar to that shown in **Table 4.3** has been used to capture the assessment of each revised feasible water resource management option in a consistent manner; a key to the meaning of the symbols is presented in **Table 4.4**.

Table 4.3 Example Feasible Options Assessment Matrix

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option Name	Construction (negative)	--/?	--	0	--/?	-	-	--	0	--/?	--	-/?	-/?	-/?	-	--/?	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++/?	0	+	0	+/?	0	0
	Operation (negative)	--/?	-	0	0	--	--/?	--	-	--	--	0	0	0	-	0	0	0
	Operation (positive)	+	+	0	0	+	+	+	0	+	+	++	+	++	+	+	0	0

Construction

Objective 1: Minor/Moderate/Major negative uncertain effect - due to....
Objective 1: Minor/Moderate/Major positive uncertain effect - due to....
Objective 2: Minor/Moderate/Major negative uncertain effect - due to....
Objective 2: Minor/Moderate/Major positive uncertain effect - due to....
Objective 3: Minor/Moderate/Major negative uncertain effect - due to....
Objective 3: Minor/Moderate/Major positive uncertain effect - due to....
Objective 4: Minor/Moderate/Major negative uncertain effect - due to....
Objective 4: Minor/Moderate/Major positive uncertain effect - due to....
Objective 5: Minor/Moderate/Major negative uncertain effect - due to....
Objective 5: Minor/Moderate/Major positive uncertain effect - due to....
Objective 6: Minor/Moderate/Major negative uncertain effect - due to....
Objective 6: Minor/Moderate/Major positive uncertain effect - due to....
Objective 7: Minor/Moderate/Major negative uncertain effect - due to....
Objective 7: Minor/Moderate/Major positive uncertain effect - due to....
Objective 8: Minor/Moderate/Major negative uncertain effect - due to....
Objective 8: Minor/Moderate/Major positive uncertain effect - due to....
Objective 9: Minor/Moderate/Major negative uncertain effect - due to....
Objective 9: Minor/Moderate/Major positive uncertain effect - due to....
Objective 10: Minor/Moderate/Major negative uncertain effect - due to....
Objective 10: Minor/Moderate/Major positive uncertain effect - due to....
Objective 11: Minor/Moderate/Major negative uncertain effect - due to....
Objective 11: Minor/Moderate/Major positive uncertain effect - due to....
Objective 12: Minor/Moderate/Major negative uncertain effect - due to....
Objective 12: Minor/Moderate/Major positive uncertain effect - due to....
Objective 13: Minor/Moderate/Major negative uncertain effect - due to....
Objective 13: Minor/Moderate/Major positive uncertain effect - due to....
Objective 14: Minor/Moderate/Major negative uncertain effect - due to....
Objective 14: Minor/Moderate/Major positive uncertain effect - due to....
Objective 15: Minor/Moderate/Major negative uncertain effect - due to....
Objective 15: Minor/Moderate/Major positive uncertain effect - due to....
Objective 16: Minor/Moderate/Major negative uncertain effect - due to....
Objective 16: Minor/Moderate/Major positive uncertain effect - due to....
Objective 17: Minor/Moderate/Major negative uncertain effect - due to....
Objective 17: Minor/Moderate/Major positive uncertain effect - due to....

Operation

Objective 1: Minor/Moderate/Major negative uncertain effect - due to....
Objective 1: Minor/Moderate/Major positive uncertain effect - due to....
Objective 2: Minor/Moderate/Major negative uncertain effect - due to....
Objective 2: Minor/Moderate/Major positive uncertain effect - due to....
Objective 3: Minor/Moderate/Major negative uncertain effect - due to....
Objective 3: Minor/Moderate/Major positive uncertain effect - due to....
Objective 4: Minor/Moderate/Major negative uncertain effect - due to....
Objective 4: Minor/Moderate/Major positive uncertain effect - due to....
Objective 5: Minor/Moderate/Major negative uncertain effect - due to....
Objective 5: Minor/Moderate/Major positive uncertain effect - due to....
Objective 6: Minor/Moderate/Major negative uncertain effect - due to....
Objective 6: Minor/Moderate/Major positive uncertain effect - due to....
Objective 7: Minor/Moderate/Major negative uncertain effect - due to....
Objective 7: Minor/Moderate/Major positive uncertain effect - due to....
Objective 8: Minor/Moderate/Major negative uncertain effect - due to....
Objective 8: Minor/Moderate/Major positive uncertain effect - due to....
Objective 9: Minor/Moderate/Major negative uncertain effect - due to....
Objective 9: Minor/Moderate/Major positive uncertain effect - due to....
Objective 10: Minor/Moderate/Major negative uncertain effect - due to....
Objective 10: Minor/Moderate/Major positive uncertain effect - due to....
Objective 11: Minor/Moderate/Major negative uncertain effect - due to....
Objective 11: Minor/Moderate/Major positive uncertain effect - due to....
Objective 12: Minor/Moderate/Major negative uncertain effect - due to....
Objective 12: Minor/Moderate/Major positive uncertain effect - due to....
Objective 13: Minor/Moderate/Major negative uncertain effect - due to....
Objective 13: Minor/Moderate/Major positive uncertain effect - due to....
Objective 14: Minor/Moderate/Major negative uncertain effect - due to....
Objective 14: Minor/Moderate/Major positive uncertain effect - due to....
Objective 15: Minor/Moderate/Major negative uncertain effect - due to....
Objective 15: Minor/Moderate/Major positive uncertain effect - due to....
Objective 16: Minor/Moderate/Major negative uncertain effect - due to....
Objective 16: Minor/Moderate/Major positive uncertain effect - due to....
Objective 17: Minor/Moderate/Major negative uncertain effect - due to....
Objective 17: Minor/Moderate/Major positive uncertain effect - due to....

Table 4.4 Qualitative Scoring System

Score	Description	Symbol
Major/Significant Positive Effect	Significant positive effect of the water resource option on this objective	+++
Moderate Positive Effect	Moderate positive effect of the water resource option on this objective	++
Minor Positive Effect	Minor positive effect of the water resource option on this objective	+
Neutral	Neutral effect of the water resource option on this objective	0
Minor Negative Effect	Negative effect of the water resource option on this objective	-
Moderate Negative Effect	Moderate effect of the water resource option on this objective	--
Major/Significant Negative Effect	Significant negative effect of the water resource option on this objective	---

Score	Description	Symbol
Uncertain	The water resource option has an uncertain relationship to the objective or the relationship is dependent on the way in which the aspect is managed. In addition, insufficient information may be available to enable an assessment to be made.	**?**

4.4.2 Preferred Options

The individual preferred options that comprise the preferred plan for Cambridge Water's draft WRMP24 will be subject to further detailed assessment against the 17 SEA assessment objectives with the results recorded in a matrix similar to that shown in **Table 4.3.** This will take account updated option information such as scheme design, incorporated mitigation measures, stakeholder and regulator views. Where relevant, the commentary section of the matrices includes justification for how the assessment has been reached including those factors previously outlined in **Section 4.3** above, as well as:

- any assumptions used.
- the reasons for any uncertainty, where this is identified; and
- any further mitigation measures with the potential to avoid, minimise, reduce, mitigate or compensate for the identified effect(s) with evidence (where available).

4.4.3 Preferred Programme Assessment

In addition to the consideration of the effects of the individual preferred options, the cumulative effects of the preferred programme of options will be assessed. These programmes are combined and assessed cumulatively, to ensure that the strategic effects of the draft WRMP24 have been identified, described and evaluated.

4.4.4 Alternative Plan Assessment

SEA Regulation 12(2) requires the identification, description and evaluation of "the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme". The EC guidance[25] on the SEA Directive discusses possible interpretations of handling 'reasonable alternatives'. It states that "The alternatives chosen should be realistic. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme". Echoing this, Government guidance[26] of the SEA states "Only reasonable, realistic and relevant alternatives need to be put forward. It is helpful if they are sufficiently distinct to enable meaningful comparisons to be made of the environmental implications of each". It is an area of plan making that has received considerable scrutiny and challenge.

In addition, reasonable alternatives that operate at the plan level will also be considered. The cumulative effects will be identified, described and evaluated for each reasonable alternative plan, for consideration along with the preferred plan (*noting that no alternative plans have been identified*).

4.4.5 Assessment of Secondary, Cumulative and Synergistic Effects

The SEA Regulations require that the cumulative effects of the draft WRMP24 are assessed. In addition to the assessments of the preferred programme of option (at the WRZ level) and plan level assessments (and alternatives) described above, this has included the cumulative effects of the draft WRMP24 in-combination with other plans and programmes. This includes:

25 EC (2003) Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment.

26 Office of the Deputy Prime Minister et al (2005) A Practical Guide to the Strategic Environmental Assessment Directive. Available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf [Accessed June 2022]

- effects of the draft WRMP24 with other (same) water company plans – an assessment of the effects of the draft WRMP24 with Cambridge's Drought Plan and Drainage and Wastewater Management Plan (DWMPs);
- effects of the draft WRMP24 with adjacent water company plans and projects (SROs);
- effects of the draft WRMP24 as part of the WRW draft Regional Plan;
- effects of the draft WRMP24 with other plans e.g., Local Plans, National Policy Statements (NPSs);
- effects of the draft WRMP24 with other Nationally Significant Infrastructure Projects (NSIPs).

When considering the above, the assessment has been qualitative.

There are areas where the draft WRMP24 preparation has considered some of the other plans and programmes. For example, Cambridge Water's Drought Plan measures have been included in the draft WRMP24 and the Local Plan growth and population projections have already been included within the demand projections.

In terms of other water company and sector plans, some will have completed assessments in the public domain e.g. DWMPs and which have been used to inform this assessment, where appropriate.

In terms of the NPSs, the majority are not location specific, with two of the three exceptions (aviation, wastewater) making provision for growth outside the Cambridge WRMP24 area. At this stage four NSIPs are within proximity to the Cambridge Water Resource area. Further NSIP projects that would be associated with intensive water use have been identified drawing on the NSIP information from the NIP regional project database site https://infrastructure.planninginspectorate.gov.uk/ (focusing on those NSIPs where DCO consent has been granted by the SoS).

When considering the effects of SROs, we have drawn on relevant assessment information provided for the RAPID gated submission process.

4.4.6 Definitions and Thresholds of Significance

Specific guidance has been developed for what constitutes a significant (major) effect, a moderate effect, a minor effect or a neutral effect for each of the SEA objectives. These 'definitions and thresholds of significance' help to ensure a consistent approach to interpreting the significance of effects and helps the reader understand the decisions made by the assessor.

Cambridge Water is part of South Staffs Water and therefore to ensure consistency across the approaches and allow integration of outcomes, it is suggested that the proposed methodology for Cambridge Water will closely follow the South Staffs Water WRMP24 (and WRW regional plan SEA. An example of thresholds is provided for biodiversity in **Table 4.5** with the full suite of definitions presented in **Appendix E**.

In developing the definitions and thresholds of significant effects for Cambridge Water WRMP, information was drawn from:

- the approach used for the South Staffs Water WRMP24 (and WRW regional plan);
- the previous definitions and thresholds used in the SEA's of WRMP19;
- suggested definitions and thresholds for assessment scoring from the All Company Working Group (ACWG) for application to the SROs;
- an evaluation of the range of quantitative values (such as yield, capex, embodied carbon, operational carbon and material quantities) available for a selection of WRMP19 options for different option types (e.g., supply-side options such as reservoirs, transfers, boreholes, enhanced treatment).
- scoping consultation feedback;
- practical revisions made when applying the thresholds to the revised feasible option assessment.

Table 4.5 Example Definitions of Significant Effects

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
1. To protect and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	Will it 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)? Will it protect and enhance non-designated sites and local biodiversity? Will it provide opportunities for new terrestrial and aquatic habitat creation or restoration and/or link existing habitats as part of the development process? Will it provide opportunities to deliver biodiversity net gain? Will it lead to a change in the ecological quality of habitats? Will it protect, and enhance where appropriate, coastal and marine habitats and species? Will it maintain and enhance the green infrastructure network and the biodiversity it supports?	+++	Major/ Significant Positive	The option would result in a major enhancement on the quality of designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat quality and availability. The option would result in a major increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or large amounts of creation or enhancement of habitat, promoting a major increase in ecosystem structure and function.
		++	Moderate Positive	The option would result in a moderate enhancement on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a moderate increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or moderate amounts of creation or enhancement of habitat, promoting a moderate increase in ecosystem structure and function.
		+	Minor Positive	The option would result in a minor enhancement of the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a minor increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or small amounts of creation or enhancement of habitat, promoting a minor increase in ecosystem structure and function.
		0	Neutral	The option would not result in any effects on designated or non-designated sites including habitats and/or species).
		-	Minor Negative	The option would result in a minor negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a minor decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or small losses or degradation of habitat leading to a minor loss of ecosystem structure and function.
		--	Moderate Negative	The option would result in a moderate negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a moderate decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or moderate loss or degradation of habitat leading to a moderate loss of ecosystem structure and function.
		---	Major/ Significant Negative	The option would result in a major negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a major decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or large losses or degradation of habitat leading to a major loss of ecosystem structure and function.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain

4.5 DIFFICULTIES ENCOUNTERED IN UNDERTAKING THE ASSESSMENT

The SEA Regulation requires the identification of any difficulties (such as technical deficiencies or lack of knowledge) encountered during the assessment process. The difficulties encountered in undertaking the SEA of the draft WRMP are summarised below:

- Due to the scope of the WRMP24, and its nature in combining site-specific options into a plan for the whole of Cambridge Water's region, a balance needed to be struck between the information provided as an overview of the whole area and the detail of a specific location. Throughout the whole process, it was necessary to ensure the need for enough information to undertake a robust assessment, while retaining its strategic focus.
- Reflecting the strategic nature of the draft WRMP and SEA, for many resource management options exact site locations and pipeline routes are approximated at this stage whilst the final design of new infrastructure is unknown. However, the assessments of feasible and preferred options have been based on the best available information provided by Cambridge Water and any assumptions used in the assessment (e.g. in respect of pipeline routes) have been highlighted where appropriate. For some option types (e.g. leakage reduction options), the location of works are not known at this stage and would (if taken forward) be subject to more detailed analysis during the implementation of the WRMP. In consequence, effects on some objectives such as biodiversity are uncertain for these options. Where this is the case, the assessment has reflected this uncertainty.
- Whilst the assessment of the cumulative effects of the implementation of the draft WRMP24 and other plans and programmes has been based on the most up to date information available at the time of writing, in many cases there is a lack of detailed information at this stage to make robust conclusions. This is a typical issue encountered during the assessment of WRMPs.

5. ASSESSMENT OF THE REVISED FEASIBLE OPTIONS

5.1 INTRODUCTION

This section presents the findings of the assessment of the revised feasible options identified as part of the preparation of the draft WRMP24 for the Cambridge Resource Zone (**Section 5.2**). The types of feasible options in the assessment are outlined below:

- **Supply Options** which will include measures to increase supply such as greywater and effluent re-use, rainwater harvesting, reservoir or surface water supply and third part potable water transfer.
- **demand options** including**:**
    - **distribution and leakage options** which include measures to optimise the efficiency of water networks, reduce leakage and minimise any unscheduled resource losses;
    - **metering options** which include options to manage the demand for water using smart meters;
    - **efficiency options** which include measures to manage the demand for water such as rainwater harvesting, greywater recycling or household visits to install water efficiency measures.

For the purposes of this Environmental Report the Cambridge Water options are split into supply and demand options.

5.2 CAMBRIDGE RESOURCE ZONE

Eighteen feasible supply options were assessed for the Cambridge Resource Zone which are outlined in

Table 5.1. The assessment summary of the supply options is presented in **Table 5.2** with commentary on the likely significant construction and operational effects discussed in **Section 5.3.25.3.1**. Detailed assessment matrices are in **Appendix E**.

Table 5.1 Feasible Supply Options: Cambridge Resource Zone

Option ID	Option Name	Yield
01A	Combined Ouse Gravel Sources - Fenstanton to St Ives	*0.55Ml/d*
01B	Combined Ouse Gravel Sources – Fenstanton to St Ives	*4Ml/d*
37Ai	Northstowe greywater reuse or similar growth large storage	*0.5Ml/d*
37Aii	Northstowe greywater reuse or similar growth small storage	*0.5Ml/d*
38A	Site-scale rainwater harvesting (Northstowe or similar growth)	*0.9Ml/d*
38B	Northstowe rainwater harvest or similar growth small storage	*0.9Ml/d*
57	New surface water – River CAM abstraction and treatment works	*7Ml/d*
71	Effluent re-use (supply side)	*7Ml/d*
73A	Internal potable water transfer – FENS Reservoir potable transfer	*50Ml/d*
75Ai	AWS potable transfer through CAM area 5Mld	*5Ml/d*

Option ID	Option Name	Yield
75Aii	AWS potable transfer through CAM area 5Mld with main cost	*5Ml/d*
75Aiii	AWS potable transfer through CAM area 5Ml/d with main cost and 0.3ha blending plant	*5Ml/d*
75Bi	AWS potable transfer through CAM area 10Mld	*10Ml/d*
75Bii	AWS potable transfer through CAM area 10Mld with main cost	*10Ml/d*
75Biii	AWS potable transfer through CAM area 10Ml/d with main cost and 0.4ha blending plant	*10Ml/d*
75Ci	AWS potable transfer through CAM area 15Mld	*15Ml/d*
75Cii	AWS potable transfer through CAM area 15Mld with main cost	*15Ml/d*
75Ciii	AWS potable transfer through CAM area 15Ml/d with main cost and 0.5ha blending plant	*15Ml/d*

Table 5.2 Feasible Supply Options Assessment Summary: Cambridge Resource Zone

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 01A	Construction (negative)	-/?	-	-	-	0	-	-	-/?	0	0	0	-	-	0	-	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0
	Operation (negative)	-/?	0	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	0	0	0	0	0	0	0
Option 01B	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	-	-	0	-	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0
	Operation (negative)	-/?	0	0	0	-	-	0	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	?	+	0	0	0	0	0	0	0	+	+	0	+	0	0	0	0
Option 37Ai	Construction (negative)	-	0	-	-/?	0	-	-	-/?	-	0	0	-	--	0	-/?	-/?	0
	Construction (positive)	0	0	0	+	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	0	0	0	0	+	+	0	+	0	++	0	0
Option 37Aii	Construction (negative)	-	0	-	-/?	0	-	-	-/?	-	0	0	-	--	0	-/?	-/?	0

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
	Construction (positive)	0	0	0	+	0	0	0	0	0	0	++	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	0	0	0	0	+	+	0	+	0	++	0	0
Option 38A	Construction (negative)	-	0	-	-/?	0	-	0	-/?	-	0	0	0	--	0	-/?	0	-
	Construction (positive)	0	0	0	+	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	--	--	0	0	--	--	0	0	-	0	0	0	0	0	-	0	-/?
	Operation (positive)	0	0	0	0	0	+	+/?	0	0	+	0	0	+	+	++	0	0
Option 38B	Construction (negative)	-	0	-	-/?	0	-	0	-/?	-	0	0	0	--	0	-/?	0	-
	Construction (positive)	0	0	0	+	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	-	--	0	0	--	--	0	0	-	0	0	0	0	0	-	0	-/?
	Operation (positive)	0	0	0	0	0	+	+/?	0	0	+	0	0	+	+	++	0	0
Option 57	Construction (negative)	--/?	--	-	---	0	-	--	-/?	--	0	0	-	-	0	--/?	---	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	-	0	--	0	-	-	0	0	--	0	0	0	0	0	--/?	0	0
	Operation (positive)	0	+	0	0	0	0	++	0	0	+	++	0	++	++	0	0	0

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 71	Construction (negative)	-	--	-	--	0	-	0	-/?	--	0	0	-	-	0	---/?	---	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	-	0	0	0	-	-	0	0	-	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	++	0	0	0	+	0	0	0	+	++	0	++	+	0	0	0
Option 73A	Construction (negative)	-/?	---	-	--	0	-	--	--/?	--	-/?	0	--	-	0	---/?	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	?	+++	0	0	0	0	0	0
	Operation (negative)	0	0	-	0	-	-/?	0	0	---	0	0	0	0	0	-	0	-
	Operation (positive)	0	++	0	0	0	0	++	0	0	++	+++	+	+++	++	0	0	0
Option 75Ai	Construction (negative)	-/?	-	-	-	0	-	0	-/?	0	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 75Aii	Construction (negative)	-/?	-	-	-	0	-	0	-/?	-	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	0

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 75Aiii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 75Bi	Construction (negative)	-/?	-	-	-	0	-	0	-/?	0	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 75Bii	Construction (negative)	-/?	-	-	-	0	-	0	-/?	-	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 75Biii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 75Ci	Construction (negative)	-/?	-	-	-	0	-	0	-/?	0	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 75Cii	Construction (negative)	-/?	-	-	-	0	-	0	-/?	-	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 75Ciii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0

Three demand options were assessed for the Cambridge Water supply area; these are listed in **Table 5.3.** A summary of the assessment of these options is presented in **Table 5.4** with commentary on the likely significant construction and operational effects provided in **Section 5.3.2**.

Table 5.3: Feasible Demand Management Options: Cambridge WRZ

Option name	Savings by 2050
50% leakage reduction	6.25 Ml/d
110 l/h/d (including water labelling)	10.89 Ml/d
9% Non-Household (NHH) Reduction	3.78 Ml/d

Table 5.4 Feasible Demand Management Options Assessment Summary

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
50 % leakage reduction	Construction (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	?	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0
	Operation (negative)	?	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	++	0	++	+	0	0	0
110 l/h/d (including water labelling)	Construction (negative)	0	0	0	0	0	0	0	?	-/?	0	0	0	0	0	?	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0
	Operation (negative)	?	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	++	0	++	+	0	0	0
9% NHH reduction	Construction (negative)	0	0	0	0	0	0	0	?	?	0	0	0	0	0	?	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	+	0	+	0	0	0	0

5.3 FEASIBLE OPTIONS ASSESSMENT

5.3.1 Supply Side Options

Construction Phase

Of the 18 supply options assessed, 12 feasible options (37Ai, 38A, 38B, 57, 71, 73A, 75Aii/iii, 75Bii/iii, 75Cii/iii) were found to have major positive effects on the local economy (SEA Objective 11) as the significant capital expenditure (>£25 million) has the potential to generate employment opportunities during the construction period. Of the remaining feasible options, one (37Aii) was assessed as moderate positive and the remaining five options were assessed as minor positive or neutral.

SEA Objective 2 assesses the effect an option has on sustainable natural resources and the temporary or permanent loss of greenfield land and habitats as concluded by the BNG assessment. Only one option, 73A, has been identified as having a major negative impact against SEA Objective 2 as a result of the various components required for construction. Options 57 and 71 will both result in a moderate negative impact during construction. All options will have a neutral positive impact during construction against SEA Objective 2.

Option 57 was identified as major negative for SEA Objective 4 (Soil, Geodiversity and Land use) due to the construction of a 10km pipeline with the majority being built on Grade 2 and Grade 3 agricultural land resulting in temporary and permanent loss of versatile agricultural land. Options 71 and 73A have been assessed as moderate negative against SEA Objective 4 due to the proximity to historic landfill sites where there is potential to disturb contaminated land. These options are also set to have additional construction on Grade 1, Grade 2 or Grade 3 agricultural land resulting in permanent and temporary loss of best and versatile land. Options (01A, 01B, 75Ai/ii/iii, 75Bi/ii/iii, 75Ci/ii/iii) have been identified as minor negative for their impact on soil, geodiversity and land use. Four options (37Ai, 37Aii, 38A and 38B) were assessed as minor negative uncertain as the location of specific assets are yet to be confirmed. These four options were also identified as providing a minor positive impact against SEA Objective 4 due to the development of previously developed land.

Two options (71 and 73A) are expected to result in major negative impacts on waste and resource use (SEA Objective 15). Option 71 will include pumps, control buildings, and pumped pipelines. WTW Option 73A will involve development of a new pumping station, strategic main and upgrades to existing reservoirs which therefore require significant use of new materials. Although specific material quantities are unknown, the scale of the assets described are in-line with assumptions of large-scale development. An uncertain rating has also been identified with both options. Option 57 has been assessed as having a moderate negative impact during construction due to the requirement for new infrastructure and associated raw construction material. No options have been assessed as producing positive impacts against SEA Objective 15 during construction.

SEA Objective 16 aims to identify potential impacts on cultural heritage sites and features. Two options have been identified as having a major negative impact during the construction phase (57 and 71). Construction of the embankment reservoir for option 51 will be within the Horningsea kilns Conservation Area which will result in permanent loss of the asset and diminishing of its significance. The pipeline element of option 51 also directly intersects the Fulbourn Hospital Conservation Area which is listed on the 'Heritage at Risk' register. Similarly, the pipeline of option 71 also intersects the Fulbourn Hospital Conservation Area. Option 71 is also in close proximity to a Scheduled Monument [Settlement site by Caudle Corner Farm]. Two options have been assigned a minor negative uncertain impact to cultural heritage (options 37Ai, 37Aii) with another (73A) assessed as minor negative. The ten remaining options have a neutral impact against SEA Objective 16. No positive impacts to cultural heritage have been identified by any of the ten options.

All options were identified to have negative impact on biodiversity (SEA Objective 1) during construction. Option 57 was assessed to have a moderate negative uncertain for biodiversity due to the proximity to a number of designated sites. Three SSSI's are within 1km of the option site with one (Cherry Hinton) located within 100m where construction activities may cause significant effects, however these could be reduced to moderate with appropriate mitigation. Spined Loach may be present within the River Cam (700m from the Fenland SAC which is located within 8km of the construction area). Construction work may therefore impact the supporting habitat for Spined Loach if present in the River Cam through surface pollution incidents, sedimentation or introduction of INNS. The HRA Stage 2 Appropriate Assessment concluded no adverse effects providing appropriate mitigation is embedded. Although option 57 has been identified as moderate negative, it has also been classified as uncertain until further details of the construction activities are available. The remaining 17 options were identified as having minor negative or minor negative uncertain effects on biodiversity. No options have been identified as providing positive impacts during the construction phase.

No options were identified as having significant negative effects on greenhouse gas emissions (SEA Objective 9) during the construction phase. Options 57, 71 and 73A have all been identified as having a moderate negative impact on SEA Objective 9 as these options will require the use of materials and vehicle usage with total embodied carbon emissions during the construction phase are over 1000 tonnes CO$_2$e. A further eight options are expected to have a minor negative impact on greenhouse gas emissions during the construction phase. There are no options which have been identified to have a positive impact during construction.

Options 57 and 73A have been identified to have a moderate negative effect on flood risk (SEA Objective 7). Construction of new infrastructure for option 57 will partially take place within Flood Zone 3 and approximately 50% of option 73A will be constructed within Flood Zones 2 and 3. No positive impacts during construction for any options have been identified against SEA Objective 7. Four options (01A, 01B, 37Ai and 37Aii) were identified as a minor negative effect.

One option (73A) has been assessed as having a moderate negative impact on air quality (SEA Objective 8) during construction. The increase in vehicle movement associated with construction activity of this option is likely to cause short-term deterioration in local air quality. The exact number of vehicle movements are currently unknown with the extent of impact also designated as uncertain. All other options have been identified as having a minor negative uncertain impact during construction. No options will have a positive impact during construction.

One option (73A) will have a moderate negative effect on tourism and recreation (SEA Objective 12). This option has been identified to be within close proximity to numerous greenspace areas, CRoWs) and intersect national cycle routes which will have a moderate negative impact to these community assets. Six options (01A, 01B, 37Ai, 37Aii, 57 and 71) have been identified as having a minor impact against SEA Objective 12. No options will have a positive impact during construction.

Option 73A will have a moderate negative impact on landscape (SEA Objective 17) as a result of construction on the Cambridge Greenbelt which will be visually intrusive to the semi-rural landscape in the long-term. Ten options will have a minor impact on landscape during construction predominantly due to construction on the Cambridge Greenbelt. There will be no positive impacts during construction from any options assessed.

Only one option (73A) is set to have a negative impact on climate resilience (SEA Objective 10) during construction due to increased vulnerability to flooding, however this is rated as minor negative with uncertainty until final scheme details are confirmed. The remaining options have been assessed as having a neutral impact during construction with no options providing positive impacts.

Four options (37Ai, 37Aii, 38A and 38B) have been assessed as having a moderate negative impact during construction on human health and wellbeing (SEA Objective 13). This is a result of construction activity taking place in proximity to residential receptors who will be exposed to noise disturbance, vibration, dust deposition and air quality deterioration. The remaining 14 options have been assessed as having a minor negative impact during construction.

All options have been assessed as having a minor negative impact on water quality (SEA Objective 6). No options would lead to a WFD classification change however construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors.

Against SEA Objective 3, INNS, all options have been assessed as having a minor negative impact during construction assuming best practice biosecurity measures are adopted. No positive impacts during construction have been identified for any option.

The impact on water quantity (SEA Objective 5) and waste and resource use (SEA Objective 14) for all the options have been assessed as neutral negative and neutral positive during construction.

Operational Phase

Only one option (73A) has been identified as having a major negative impact during operation. This major negative impact has been assessed against SEA Objective 9, greenhouse gas emissions. During operation, option 73A will have a new strategic main and pumping station which will require significant energy to pump water resulting in a major negative impact on greenhouse gas emissions. Option 57 has been assessed as having a moderate negative impact against SEA Objective 9 due to the increased operational carbon emissions. A further six options (01B, 37Ai, 37Aii, 38A, 38B and 71) were assessed as minor negative effects. There are no operational positive impacts produced from any of the feasible supply options for SEA Objective 9.

Option 73A has been assessed to bring about major positive impacts during operation against SEA Objective 11, which identifies the magnitude of impact on the local economy. This is a result of the provision of 50Ml/d additional water resource which has been assessed to significantly support local economic activity. 11 of the feasible supply options (57, 71, 75Ai/ii/iii, 75Bi/ii/iii, 75Ci/ii/iii) have been identified as bringing moderate positive impacts to the local economy with three (Options 01B, 37Ai and 37Aii) all assessed as minor positive. The remaining three options (01A, 38A and 38B) were assessed as neutral as the yields are below 1Ml/d which will have no discernible effect on the economy. No negative effects were identified for the economy during operation.

Only one other objective received a major positive rating during the assessment of the feasible supply options. This was against SEA Objective 13 in which Option 73A was assessed as providing major positive impacts to human health and wellbeing as a result of the significant additional water resource provided (50Ml/d). 11 options (57, 71, 75Ai/ii/iii, 75Bi/ii/iii, 75Ci/ii/iii) have all been assessed to provide moderate positive impacts due to the additional resource produced (5Ml/d+). No negative impacts during operation have been identified by any of the options assessed.

Two options (57 and 73A) were identified as providing moderate positive impacts during operation against SEA Objective 14, water resource use. Both options increase the resilience of water resources within the Cambridge Water supply area with an additional 7Ml/d for option 57 and 50Ml/d for option 73A. Nine additional options are set to provide minor positive impacts during operation – Options 38A, 38B, 71, 75Ai/ii/iii, 75Bi/ii/iii and 75Ci/ii/iii.

During operation, options 57 and 73A are set to bring about moderate benefits on flood risk (SEA Objective 7). Both options involve construction of infrastructure which is set to alleviate or mitigate potential flooding in the catchment area. Only two other options (38A and 38B) have been identified as providing benefits against SEA Objective 7. Both options will provide minor positive impacts to flood risk through the infrastructure potentially alleviating flooding in the catchment.

Following BNG assessments, options 71 and 73A have been assessed as providing moderate benefits to sustainable natural resources (SEA Objective 2). Both options have been assessed to assume the operational biodiversity net gain would be greater than the net loss in construction. However, further quantification is required and the magnitude is therefore uncertain. Options 38A and 38B have been assessed to bring about a moderate negative impacts to sustainable natural resources during operation due to permanent habitat loss from installation and operational use of the pre-treatment plant, storage reservoir and WTW.

Options 38A and 38B have identified minor negative uncertain impacts on landscape (SEA Objective 17) during operation due to its permanent features potentially impacting upon the existing landscape features. Option 73A has been assessed to impact the landscape, having a minor negative effect, due to the permanent alteration of the landscape as a result of operational infrastructure.

All eighteen options will provide positive benefits against SEA Objective 10, climate resilience, due to the additional water resource provided by each option and the associated increase in resilience to climate change impacts. Option 73A will bring moderate positive benefits to climate resilience (50Ml/d yield) whereas the 17 remaining options will bring about minor benefits against SEA Objective 10 (0-25Ml/d yield).

Option 57 will require the construction of a new reservoir fed by raw water abstraction from the River Cam, a new habitat and transfer pathway for INNS. This option has therefore been assessed as moderate negative during operation against SEA Objective 3. Additionally, options 71 and 73A have been identified as minor negative for INNS during operation.

Most supply options (excluding 01A) will negatively impact waste and resource use (SEA Objective 15). Option 57 has been designated as moderate negative due to the requirement for additional energy and chemical use. Options 37Ai, 37Aii, 38A and 38B are set to bring about moderate benefits against SEA Objective 15 due to the incorporation of sustainable design measures such as greywater re-use and rainwater harvesting.

Option 38A was assessed as having a moderate negative effect on biodiversity (SEA Objective 1) during operation. This option would intercept rainwater and increase pressures in the receiving watercourse where there are already flow pressures. Five supply options (01A, 01B, 38B, 57, and 71) have been assessed as minor negative with respect to biodiversity (SEA Objective 1). The remaining 12 options were not identified to have a negative effect on biodiversity during operation. No option was assessed to have a positive impact against SEA Objective 1 during operation.

Seven options were identified as having negative effects for both water quantity (SEA Objective 5) and water quality (SEA Objective 6). Options 38A and 38B were assessed as moderate for both as the capture of rainwater would reduce flows in an area where there are existing flow pressures which could have impacts on both water quantity and quality. The outcome of the WFD compliance assessment for both these options were non-compliance (low confidence). Five options (01A, 01B, 57, 71 and 73A) were assessed as minor negative for both options. Three options (38A, 38B and 71) have also been assessed as having positive impacts on water quality during operation. For options 38A and B it was identified that the capture of rainfall runoff prior to entering the river network, reducing the diffuse source pollution, has the potential for positive water quality impacts. However, the reduction in daily volume could also impact flow leading to a deterioration of physico-chemical water quality status elements. No other options (excl. 38A, 38B and 71) have been identified as providing water quality benefits during operation.

Option 73A has been identified as providing a minor benefit on tourism and recreation (SEA Objective 12) through the creation of a new reservoir which has potential to introduce new recreational and amenity facilities.

SEA Objective 4 (Soils, geodiversity and land use) 8 (Air Quality) and 16 (Cultural heritage) have no options that will provide negative or positive impacts during operation.

5.3.2 Demand Management Options

The Demand Management options are a package of measures designed to meet Cambridge Water's business goals. The measures reduce leakage (e.g. Active leakage control, trunk mains leakage reduction, advanced pressure optimisation, pipe repair or replacement), water efficiency measures (e.g. changings to tariff structures, and promotion of water efficient devices) and installation of enhanced meter technology. Overall, demand management options serve to reduce pressure on water resources by reducing customer demand for water and thereby helping to reduce the volumes of water abstracted from the water environment. This, in turn, also contributes to reducing the amount of energy needed for water abstraction, treatment and distribution.

Construction

During construction, the effects are limited to temporary effects associated with vehicle movements during their commissioning phases. They may cause disruption as a result of streetworks or nuisance however these are anticipated to be neutral. As a result of meter installations, for example, a minor negative uncertain effect has been assessed from Water Efficiency measures on greenhouse gas emissions (SEA Objective 9) to reflect the potential for embodied carbon from material production of water meters and water efficiency devices. In addition, further emissions are possible from vehicle movements to carry out the various activities, including home/site visits and installations as well as leakage reduction activities. However, the amount of vehicle movements associated with these activities are currently unknown and have therefore been assessed as uncertain.

Operation

During operation, no significant positive effects were identified for any of the three demand reduction options. Moderate positive effects were identified for the 50% leakage reduction and water efficiency (110 l/h/d) options on the economy (SEA Objective 11), and human health and wellbeing (SEA Objective 13) by helping to ensure a continual supply of clean drinking water and increase resilience of supply to Cambridge Water customers, supporting economic growth which could result in a positive effect on the local economy and social wellbeing. The remaining demand management option (9% NHH reduction) identified minor positive effects for these objectives as the estimated yield is lower.

Minor positive effects were identified elsewhere for water resource use (SEA Objective 14) due to the reduction in leaks and reduction in demand for water that the two options with larger yields (50% leakage reduction and 110 l/h/d) will provide.

All three demand options were identified as having a minor positive effect on water quantity (SEA Objective 5) as these options will reduce the overall demand for water without requiring any additional abstraction to achieve the additional yield.

Minor positive effects were reported on climate resilience (SEA Objective 10) for all three options due to contributing to increasing the resilience/decreasing vulnerability to the effects of climate change.

5.4 USING THE FINDINGS OF THE REVISED FEASIBLE OPTIONS ASSESSMENT TO INFORM DECISION MAKING

The SEA findings for the revised feasible options have been used as inputs to Multi-Criteria Analysis (MCA) detailed screening, scenario testing and, selection of the preferred programme of options.

5.4.1 Screening

Cambridge Water has completed a process of option screening using screening criteria aligned to that of South Staffs Water (and that was developed in conjunction with WRW core member companies and stakeholders) to inform option selection and development. These were applied at two stages of option development:

- high-level screening of unconstrained options; and
- a detailed screening of revised feasible options.

A Red-Amber-Green (RAG) approach was adopted for both stages of the screening process, which grades an option to a given criteria on a satisfactory to unsatisfactory basis (Green being satisfactory, Red being un-satisfactory).

Cambridge Water first developed an unconstrained list of options, which included demand-side, supply-side, production, third-party and resilience options. The unconstrained list went through a high-level screening exercise to determine a list of feasible options.

Unconstrained options were evaluated through the high-level screening process. This included criteria such as technical feasibility, environmental risk and water availability amongst other factors. Several options were screened out at this stage, with justifications including:

The high-level screening included three criterion that reflected environmental considerations, under the 'Environmental, planning, and other regulatory constraints' category:

- Does the option cause unmitigable damage to a European designated site (SAC/SPA/Ramsar)?
- Does the option cause unmitigable damage to a Nationally designated site (SSSI/NNR/National Park/Ancient Woodland)?
- Does the option cause unmitigable damage to a Site with significant heritage or visual amenity value (e.g. Scheduled Ancient Monument or AONB)?

The detailed screening included a criterion that explicitly used the findings of the SEA, in terms of outputs from the revised feasible option assessments:

- Does the option meet the social and environmental objectives of the relevant SEA?

The high-level screening led to unconstrained options being screened out, with justifications including:

- Environmental risks being too great and/or deemed unmitigable.
- Water bodies / groundwater bodies affected by option already being in Poor status or already under considerable stress.
- Option is deemed far too politically or socio-economically unacceptable.
- Not enough evidence or information given to support the option and allow it to carry forward to the Secondary screening level.

This process resulted in the identification of eighteen feasible supply options in addition to demand management measures. Detailed screening was carried out on these options which included a criterion that explicitly used the findings of the SEA, in terms of outputs from the revised feasible option assessments:

- Does the option meet the social and environmental objectives of the relevant SEA?

Options that were screened out at detailed screening stage on the basis of environmental risks identified by the SEA including the following justifications:

- Potentially significant negative impacts on biodiversity (SAC). The risk would be significant as effects are certain and adverse effects likely to be unavoidable.

- Potential for deterioration in the context of the WFD. Mitigation or operational controls would be needed to avoid WFD impacts.
- Potentially significant INNS transfer risk due to the transfer of raw water from the source in another WFD surface water catchment. Potential impacts would require mitigation.
- Significant effects on designated landscapes and cultural heritage (proximity of various scheduled monuments, listed buildings, conservation areas and a world heritage site) are identified.

The outputs of the detailed screening were used to validate the outputs of the MCA (ValueStream1) decision-making process.

5.4.2 MCDA (ValueStream1)

With respect to the MCDA and ValueStream1 (the best value optimisation tool), the SEA objectives were mapped onto the following decision-making metric (there are a further four which are not presented as they are outside the scope of the SEA):

- Flood risk (SEA Objective 7);
- Human and social wellbeing (SEA Objectives 8, 10, 11, 12, 13, 16, 17;
- Sustainable natural resources (SEA Objectives 1, 2, 3, 4 and 15); and
- Mult-abstractor benefits (SEA Objectives 5, 6 and 14).

The assessment of effects for each SEA Objective for each revised feasible option were converted into values (on a scale of 0 – 12). These were then used as input values into the identified four metrics used in the MCA (ValueStream1). The values were then normalised to -100 to +100 scale. ValueStream1 uses solving algorithms to minimise overall costs, including environmental and social costs, while generating a scheduled plan which meets Cambridge Water's supply-demand balance. Best-value scores have been multiplied by weightings taking into account customer preferences, and the resulting scores are used in the optimisation.

Broadly, proposed options that seek to minimise demand, increase efficiencies and decrease leakages are less intrusive and have fewer adverse environmental effects; however, are not of sufficient scale to meet future water resource demands, taking into account future challenges. Supply-side options that seek to maximise existing operational efficiencies tend also to be associated with few or minor adverse effects, although consequences from any reduced flows in rivers and water bodies need also to be considered. As the scale of infrastructure requirements increases, there are consequential increases in the magnitude and significance of positive and negative effects. As reflected in the MCDA (ValueStream1) process, these has then led to the preferential selection of demand management, leakage and efficiency options with a limited number of supply side options as those representing best value options.

5.4.3 Scenario Testing

ValueStream1 was run under different scenarios to test the selection of best value options, and confirm sensitivities and dependencies within the decision-making model. The results from ValueSteam showed that the baseline plan is the same for each scenario and when testing the least cost plan for each scenario, this also selected the same plan. This allowed Cambridge Water to propose this plan as the preferred plan as it is selected under all scenarios and is both the best value and least cost plan.

5.4.4 Preferred Options

For those options taken forward for the inclusion in the draft WRMP24, further work was undertaken in discussion with Cambridge Water highlighting further opportunities for scheme refinement, taking into account potential mitigation measures identified at the feasible option stage.

The final feasible options, have then been taken forward and subject to further assessment (individually and cumulatively) to ensure that the effects of Cambridge Water's draft WRMP24 has been identified, described and evaluated.

Please refer to **Appendix F** and **Appendix G** for more detail.

6. ASSESSMENT OF THE DRAFT WRMP

6.1 INTRODUCTION

This section will describe the findings of the assessment of the draft WRMP24. In particular, it will present:

- **Section 6.2: Draft WRMP24 Preferred Option Assessment** to identify, describe and evaluate the effects of the preferred options.
- **Section 6.3: Preferred Programme Assessment** to identify the likely significant effects of the preferred programme of options (considering the effects of all preferred options as a whole).
- **Section 6.4: Alternative Plan Assessment** to identify, describe and evaluate the effects of the alternative plan identified by Cambridge Water.
- **Section 6.5: Secondary, Cumulative and Synergistic Effects Assessment** to identify, describe and evaluate the cumulative effects assessment of the preferred programme taking into account other relevant plans.
- **Section 6.6: Mitigation and Enhancement.**
- **Section 6.7: Conclusions.**

6.2 DRAFT WRMP24 PREFERRED OPTION ASSESSMENT

6.2.1 Overview of Selected Options

Following the detailed screening and selection of best value options, a total of ten supply options have been selected by Cambridge Water as preferred options. The options include new surface and ground water abstractions, storage options, re-use and transfer options. An overview of the options in the preferred programme are provided in **Table 6.1** below.

Please note: the environmental assessments are based on latest view at the time of assessment. However, options are being further reviewed and as a consequence may change the environmental assessment outcome as presented in this report. A review and update as necessary will be undertaken between draft and final WRMP24.

Table 6.1 Preferred supply options included in the draft WRMP24

CW Option Ref	Option Name	Yield (Ml/d)	First year of option use
01A	Combined Ouse gravel sources Fenstanton to St Ives 01A	0.55	2030
01B	Combined Ouse gravel sources Fenstanton to St Ives 01B	4	2030
37Aii	Northstowe greywater reuse or similar growth small storage	0.6	2035
38B	Northstowe rainwater harvest or similar growth small storage	0.9	2035
57	River CAM abstraction & treatment works	7	2040
71	AWS Milton WWTW effluent discharge reuse	7	2035
73A	Fens Reservoir internal potable water transfer Chatteris	50	2035
75Aiii	AWS potable transfer through CAM area with main cost and 0.3ha blending plant	5	2030
75Biii	AWS potable transfer through CAM area with main cost and 0.4ha blending plant	10	2030
75Ciii	AWS potable transfer through CAM area with main cost and 0.5ha blending plant	15	2030

In addition, there are three demand management options identified and included as preferred options, all of which are companywide. These are summarised in **Table 6.2.**

Table 6.2 Preferred demand management options included in the draft WRMP24

Option name	Savings by 2050
50% leakage reduction)	6.25 Ml/d
110 l/h/d (including water labelling)	10.89 Ml/d
9% Non-Household (NHH) Reduction	3.78 Ml/d

6.2.2 Summary of Effects

Table 6.3 presents the summary of the construction and operational effects of the preferred supply options. The likely significant effects are detailed by option as well as a note as to whether a Stage 2 Appropriate Assessment was required and whether the option is WFD compliant. The summary of effects of the preferred demand management options are provided in **Table 6.4**.

Table 6.3 Summary of preferred supply option assessments

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
01A	Construction (negative)	-/?	-	-	-	0	-	-	-/?	0	0	0	-	-	0	-	0	0	LSEs identified – construction and operation	Compliant (medium confidence)	**Construction:** No significant positive or negative effects have been identified during construction. A minor positive effect was identified for economy as the option is expected to have a minor positive effect on employment during construction. Minor negative effects have been identified for a range of objectives. Construction activities may result in a pollution incident (e.g. sedimentation) which would result in minor negative effects on aquatic species (SEA Objective 1) and water quality (SEA Objective 6). There may be noise, dust and vibration effects on residential receptors (SEA Objective 13). There would also be a minor negative effect on waste and resources as a number of elements requiring new resources (SEA Objective 15). The pipeline traverses valuable agricultural land (SEA Objective 4) and two national cycle routes (SEA Objective 12) and Flood Zone 3 areas (SEA Objective 7). **Operation:** No significant positive or negative effects have been identified during operation. The reduction in flows will have minor negative effects on biodiversity due to minor degradation of habitats, water quantity (SEA Objective 5) and water quality as the rivers buffering capacity may be reduced. A minor positive effect was identified for SEA Objective 2 as it is assumed that operational biodiversity net gain would be greater than the net loss in construction and in consequence, an equivalent positive score to the negative score in construction is provided. The additional yield (0.55 Ml/d) will provide additional climate resilience (SEA Objective 10).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0			
	Operation (negative)	-/?	0	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0			
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	0	0	0	0	0	0	0			
01B	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	-	-	0	-	0	0	LSEs identified – construction and operation	Compliant (medium confidence)	**Construction:** No significant positive or negative effects have been identified during construction. A minor positive effect was identified for economy as the option is expected to have a minor positive effect on employment during construction. Minor negative effects have been identified for a range of objectives. Construction activities may result in a pollution incident (e.g. sedimentation) which would result in minor negative effects on aquatic species (SEA Objective 1) and water quality (SEA Objective 6). There may be noise, dust and vibration effects on residential receptors (SEA Objective 13). There would also be a minor negative effect on waste and resources as a number of elements requiring new resources (SEA Objective 15). The pipeline traverses valuable agricultural land (SEA Objective 4) and a national cycle route (SEA Objective 12) and Flood Zone areas (SEA Objective 7).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+	0	0	0	0	0	0			

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
37Aii	Operation (negative)	-/?	0	0	0	-	-	0	0	-	0	0	0	0	0	-	0	0	No LSEs anticipated	Compliant (high confidence)	Increased vehicle movements will have a negative effect on air quality (SEA Objective 8) meanwhile, the use of materials and vehicles and the associated embodied carbon will have a minor effect on greenhouse gas emissions (SEA Objective 9). **Operation:** No significant positive or negative effects have been identified during operation. The reduction in flows will have minor negative effects on biodiversity (SEA Objective 1) due to minor degradation of habitats, water quantity (SEA Objective 5) and water quality (SEA Objective 6) as the rivers buffering capacity may be reduced. A minor positive effect was identified for SEA Objective 2 as it is assumed that operational biodiversity net gain would be greater than the net loss in construction and in consequence, an equivalent positive score to the negative score in construction is provided. The additional yield (0.55 Ml/d) will provide additional climate resilience (SEA Objective 10) as well as support to the economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13).
	Operation (positive)	?	+	0	0	0	0	0	0	0	+	+	0	+	0	0	0	0			
	Construction (negative)	-	0	-	-/?	0	-	-	-/?	-	0	0	-	--	0	-/?	-/?	0			**Construction:** A significant positive effect has been identified during construction as the option is expected to have a significant positive effect on employment during construction. A moderate negative effect on human health (SEA Objective 13) was identified due to the effects from construction (e.g. noise, dust, vibration) on nearby residential receptors. A moderate positive effect is expected on construction related employment (SEA Objective 11). Minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. The option encourages sustainable design by incorporating rainwater harvesting resulting in a moderate positive effect on SEA Objective 15. Operation of the option will require the use of energy resulting in minor negative effects on greenhouse gas emissions (SEA Objective 9) and resource use (SEA Objective 15). The additional yield (0.55 Ml/d) will provide minor positive effects for climate resilience (SEA Objective 10) whilst supporting the local economy (SEA Objective 11) and human health and wellbeing (Objective 13).
	Construction (positive)	0	0	0	+	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0			
	Operation (positive)	0	0	0	0	0	0	0	0	0	+	+	0	+	0	++	0	0			
38B	Construction (negative)	-	0	-	-/?	0	-	0	-/?	-	0	0	0	--	0	-/?	0	-	No LSEs anticipated	Non-compliant (low confidence)	**Construction:** The capital expenditure will provide a significant increase in construction employment (SEA Objective 11). The option is located in an urban area and construction activities would have moderate negative effects on residential receptors (e.g. dust, noise, vibrations) (SEA Objective 13). Minor effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. The option will result in permanent habitat loss and moderate negative effects on SEA Objective 2. The option would intercept
	Construction (positive)	0	0	0	+	0	0	0	0	0	0	+++	0	0	0	0	0	0			

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
	Operation (negative)	-	--	0	0	--	--	0	0	-	0	0	0	0	0	-	0	-/?			rainwater and reduce flows in a river already experiencing flow pressures (SEA Objective 5) and could exacerbate water quality effects from point source pollution (SEA Objective 6). Operation of the option will require the use of energy resulting in minor negative effects on greenhouse gas emissions (SEA Objective 9) and resource use (SEA Objective 15). A few positive effects have been identified. For example, the option encourages sustainable design by incorporating rainwater harvesting resulting in a moderate positive effect on SEA Objective 15 and promotes water efficiency resulting in a minor positive effect on SEA Objective 14. The additional yield (0.9 Ml/d) will provide minor positive effects for climate resilience (SEA Objective 10) whilst supporting human health and wellbeing (SEA Objective 13).
	Operation (positive)	0	0	0	0	0	+	+/?	0	0	+	0	0	+	+	++	0	0			
57	Construction (negative)	--/?	--	-	---	0	-	--	-/?	--	0	0	-	-	0	--/?	---	-	LSEs identified – construction only	Compliant (low confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). A significant negative effect was identified for SEA Objective 16 as there is a scheduled monument within the area of the embankment reservoir and construction of the scheme would result in the permanent loss of this heritage asset. This would also result in a significant land-take of valuable land (SEA Objective 4). Moderate and minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. Moderate negative effects were identified for INNS (SEA Objective 3) as the new reservoir is fed by raw water abstraction establishing a transfer pathway. The option would require additional energy usage and have a moderate negative effect on operational carbon emissions (SEA Objective 9) and resource use (SEA Objective 14). Moderate positive effects have been identified where the additional 7Ml/d resilience would increase the resilience of water resources in the supply area (SEA Objective 14) whilst support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). In addition, this option would involve the construction of an open embankment reservoir which is partially located within flood zone 3 and therefore has the potential to help alleviate or mitigate flood risk in the catchment resulting a moderate positive effect on Flood Risk (SEA Objective 7).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	-	0	--	0	-	-	0	0	--	0	0	0	0	0	--/?	0	0			
	Operation (positive)	0	+	0	0	0	0	++	0	0	+	++	0	++	++	0	0	0			
71	Construction (negative)	-	--	-	--	0	-	0	-/?	--	0	0	-	-	0	---/?	---	-	No LSEs anticipated	Compliant (low confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). A significant negative effect was identified for SEA Objective 16 as the proposed pipeline intersects a conservation area which is listed on Historic England's 'Heritage at Risk' register. A significant negative uncertain effect was identified for Waste and Resource Use (SEA Objective 15) as the option requires new infrastructure with limited opportunities to reuse or recycle waste materials. The volume of materials required is unknown but given the scale of the option and using cost as a proxy is expected to be a major amount with uncertainty until these details are confirmed. Land acquisition for the new WTW will have a permanent moderate negative effect on BNG (SEA Objective 2) and on land-use (SEA Objective 4) as the site is within valuable Grade 2 agricultural land. Construction will use a moderate amount of materials as well as
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
	Operation (negative)	-	0	0	0	-	-	0	0	-	0	0	0	0	0	-/?	0	0			vehicle usage which will contribute to embodied carbon (SEA Objective 9). Minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. Moderate positive effects have been identified where the additional 7Ml/d resilience would support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). A moderate positive effect was also identified for SEA Objective 2 as it is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided. Minor positive effects have also been identified for some other objectives.
	Operation (positive)	0	++	0	0	0	+	0	0	0	+	++	0	++	+	0	0	0			
73A	Construction (negative)	-/?	---	-	--	0	-	--	--/?	--	-/?	0	--	-	0	---/?	-	--	LSEs identified – construction only	Compliant (high confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). The various components of this option are extensive with a potential significant negative effect on SEA Objective 2. The option is expected to have a major effect on waste and resources with volumes currently unknown (SEA Objective 15). Moderate and minor negative effects have been identified for a range of other objectives. **Operation:** The operational carbon emissions are estimated to be significant (SEA Objective 9). The additional 50Ml/d resilience would provide significant positive effects support the local economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13). Moderate positive effects were identified for several other objectives.
	Construction (positive)	0	0	0	0	0	0	0	0	0	?	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	-	0	-	-/?	0	0	---	0	0	0	0	0	-	0	-			
	Operation (positive)	0	++	0	0	0	0	++	0	0	++	+++	+	+++	++	0	0	0			
75Aiii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-	LSEs identified – construction only	Compliant (high confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). Construction works may result in sedimentation which may affect qualifying features of the Ouse Washes SAC (spined loach) and the waterbird assemblage associated with the SPA and Ramsar sites. The HRA Stage 2 Appropriate Assessment concluded that with appropriate mitigation there will be no adverse effects during construction, however without further option details there is still some uncertainty. The activities may result in minor negative effects on water quality and quantity. Further minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-			

CW Ref	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	HRA Outcome	WFD Compliance	Commentary
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0			Moderate positive effects have been identified where the additional 7Ml/d resilience would support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). Further minor positive effects have been identified for other objectives.
75Biii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-	LSEs identified – construction only	Compliant (high confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). Construction works may result in sedimentation which may affect qualifying features of the Ouse Washes SAC (spined loach) and the waterbird assemblage associated with the SPA and Ramsar sites. The HRA Stage 2 Appropriate Assessment concluded that with appropriate mitigation there will be no adverse effects during construction, however without further option details there is still some uncertainty. The activities may result in minor negative effects on water quality and quantity. Further minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. Moderate positive effects have been identified where the additional 7Ml/d resilience would support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). Further minor positive effects have been identified for other objectives.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-			
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0			
75Ciii	Construction (negative)	-/?	-	-	-	0	-	-	-/?	-	0	0	0	-	0	-/?	0	-	LSEs identified – construction only	Compliant (high confidence)	**Construction:** The capital expenditure will provide a significant positive increase in construction employment (SEA Objective 11). Construction works may result in sedimentation which may affect qualifying features of the Ouse Washes SAC (spined loach) and the waterbird assemblage associated with the SPA and Ramsar sites. The HRA Stage 2 Appropriate Assessment concluded that with appropriate mitigation there will be no adverse effects during construction, however without further option details there is still some uncertainty. The activities may result in minor negative effects on water quality and quantity. Further minor negative effects have been identified for a range of other objectives. **Operation:** No significant positive or negative effects have been identified during operation. Moderate positive effects have been identified where the additional 7Ml/d resilience would support the local economy (SEA Objective 11), human health and wellbeing (SEA Objective 13). Further minor positive effects have been identified for other objectives.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0			
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-/?	0	-			
	Operation (positive)	0	+	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0			

Table 6.4 Summary of the preferred demand management option assessment

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	Commentary
50 % leakage reduction	Construction (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	?	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** Operation of the option would result in a reduction in leakage from the supply network. The additional capacity of 6.25 Ml/d will have moderate positive effects on the local economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13). The additional capacity will have minor positive effects on water quantity (SEA Objective 5), climate resilience (SEA Objective 10) and water resource use (SEA Objective 14).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	
	Operation (negative)	?	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	++	0	++	+	0	0	0	
110 l/h/d (including water labelling)	Construction (negative)	0	0	0	0	0	0	0	?	-/?	0	0	0	0	0	?	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This is a water efficiency option with a design capacity of 10.89 Ml/d. The additional capacity of 10.89 Ml/d will have moderate positive effects on the local economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13). The additional capacity will have minor positive effects on water quantity (SEA Objective 5), climate resilience (SEA Objective 10) and water resource use (SEA Objective 14).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	
	Operation (negative)	?	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	++	0	++	+	0	0	0	
9% NHH reduction	Construction (negative)	0	0	0	0	0	0	0	?	?	0	0	0	0	0	?	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This is a water efficiency option with a design capacity of 3.78 Ml/d. The additional capacity will have minor positive effects on the local economy (SEA Objective 11) and human health and wellbeing (SEA Objective 13) as well as water quantity (SEA Objective 5) and climate resilience (SEA Objective 10).
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	
	Operation (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	+	0	+	0	0	0	0	

6.3 PREFERRED PROGRAMME ASSESSMENT

Table 6.5 presents the cumulative assessment of the strategic effects of the draft WRMP24 preferred programme of options. Note where effects have been quantified, they are in aggregate, across the lifetime of the plan, noting that the implementation periods may differ between options.

Table 6.5 Preferred Programme Assessment

SEA Objective	Cumulative score	Commentary
1. To protect and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	**--/?**	The construction phases will lead to some effects due to loss of/disturbance of habitats and species. The HRA identified Likely Significant Effects for three European designated sites covered by eight different options. However, the Stage 2 assessment concluded that there are likely sufficient standard and best practice mitigation measures that can be implemented to avoid adverse effects. The HRA in-combination assessment between options in the preferred programme concluded that the operation of options 01A and 01B would not adversely affect the Ouse Washes SAC, SPA and Ramsar. Similarly, best practice measures and implementation of the project level Construction Environment Management Plans should ensure limited overlapping effects from construction projects running simultaneously. Until appropriate mitigation measures are confirmed for options where likely negative effects have been identified, the cumulative assessment is moderate negative and uncertain. Impacts during operation are considered to be minor.
2. To protect and enhance sustainable natural resources and the ecosystem services they provide.	**+++/?**	The BNG assessment identifies that there would be permanent loss of habitat during the construction of the preferred programme of supply options. However, it is assumed that in the operational phase there would then be a net gain leading to an overall net gain in biodiversity for the preferred programme. A significant positive score is assessed reflecting the scale of loss during the construction phase (that would then see a net gain in the operational phase). However, there is some uncertainty over the extent of the positive effects of the preferred programme of options.
3. To avoid and, where required, manage invasive and non-native species (INNS).	**--/?**	Overall, moderate negative effects are assessed for preferred programme with respect to INNS. The presence and extent of negative effect is uncertain given that the INNS risk assessment identifies minor risks elsewhere for the preferred programme of options. Option 57 is identified as having a moderate negative risk to transfer of INNS during operation as the proposed reservoir is fed by raw water abstraction from the River Cam and will establish a new pathway for INNS.
4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.	**---/+**	Construction and operation of water resources infrastructure could affect existing land uses due to land take associated with new development. This may result in clearance of vegetation and loss of soil levels leading to the loss of soil function and processes. Some options may also utilise existing operational land which may support achievement of the objective through making efficient use of land. Therefore, a likely mixed minor positive and major negative score is assessed for the preferred programme of options.
5. To protect and enhance surface and ground water levels and flows.	**+/--**	The demand management options included in the draft WRMP24 would result in a reduction for water demand of ~21 Ml/d which is a cumulatively minor positive effect.

SEA Objective	Cumulative score	Commentary
		Most of the supply side options would result in minor negative effects as abstraction has the potential to affect either (i) deterioration of WFD status and/or (ii) the ability of a waterbody to attain its target status. However, the WFD compliance assessment concluded that the operation of Option 38B could result in the deterioration in WFD status as the option would intercept rainwater and reduce flows in a river already experiencing flow pressures. Overall, a mix of moderate positive and moderate negative effect is assessed.
6. To protect and enhance the quality of surface and groundwater resources.	**--/?**	The WFD assessment found that construction near watercourses may lead to minor negative effects due to disturbance and increased risk of pollution events and sedimentation. The WFD assessment found that the operation of Option 38B may reduce river flow which could have an impact on water quality potentially causing a deterioration in WFD status. The WFD compliance assessment identified two waterbodies that may be impacted cumulatively by Option 38B and may cause WFD non-compliance. Some options do affect the same waterbody (38B, 71 and 57 and the River Cam) however a cumulative significant effect is not expected as the WFD assessment deemed this to be compliant overall. An overall moderate effect has been assessed with uncertainty to reflect the low confidence in the WFD cumulative assessment outcomes. The preferred demand management options would have no effects on water quality.
7. To reduce or manage flood risk.	**++/--**	A number of the options within the preferred programme will be located fully or partially within Flood Zone 3. However, the risk is localised, and the options are not expected to exacerbate flood risk issues elsewhere. Owing to the distance between the options that comprise the preferred programme, their collective implementation is not expected to increase the level of flood risk over and above that associated with the construction and operation of each option. Two options are assessed as having a moderate negative effect during construction as the options involve new above ground water supply infrastructure located partially in Flood Zone 3. During operation, the same two options are assessed as having a moderate positive effect as these options may involve measures which alleviate or mitigate flooding in the catchment e.g., new storage. Given the potential flood risk for the options that comprise the preferred programme, and the positive effects identified, a mix of cumulative moderate positive and moderate negative effects has been assessed.
8. To minimise emissions of pollutant gases and particulates and enhance air quality.	**--/?**	Construction of the preferred programme of options will generate emissions to air which could affect local air quality. The principal source of emissions would be pollutants associated with vehicle movements. Vehicle emissions could affect sensitive receptors along transport corridors and effects are likely to be more pronounced where development is located within/near AQMAs. One of the preferred options (73A) are in close proximity to an AQMA. Overall, it is concluded that there will likely be moderate negative air quality effects during the construction phase. The cumulative effects are uncertain until the exact number of vehicle movements are confirmed. In the operational phase these are expected to be neutral.

SEA Objective	Cumulative score	Commentary
		The location of the deployment of water efficiency measures is currently unknown (as well as the number of vehicular movements that may be required), yet cumulatively, at this stage, effects are anticipated to be minimal/neutral.
9. To reduce greenhouse gas emissions.	---	In total, the construction of the preferred programme of supply side options will require materials with embodied carbon. Construction will also generate vehicle movements which, together with the operation of plant and machinery, will additionally contribute to carbon emissions. The operational phase will also increase carbon emissions through increased energy used to the treat additional water. Overall, the cumulative effect on greenhouse gas emissions is anticipated to be significant negative.
10. To adapt and improve resilience to the threats of climate change.	++	Cumulatively the preferred programme of options would increase the capacity by supply by over 75Ml/d as well as a demand management reduction of ~21Ml/d which would make a moderate contribution towards securing a continual supply of clean drinking water and increase resilience of this supply, thereby increasing resilience and adaptability to the effects of climate change. Most options in the preferred programme have relatively small yields, with the largest savings of 43.5Ml/d. Therefore, an overall cumulative moderate positive effect has been assessed.
11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	+++	The supply side options will involve significant capital expenditure during the construction phase. This is considered to have a significant positive effect on the local economy through job creation and use of local supply chains which could provide the potential for a number of local businesses and SMEs to have sustained involvement and opportunities in construction. In the operational phase the Preferred Programme of options would support the delivery of clean drinking water whilst the demand management would reduce the amount of water used. This will, in-turn, support population and economic growth which would also support achievement of a cumulative significant positive effect.
12. To maintain and enhance tourism and recreation.	--	Tourism and recreation can be affected in the construction phase through, for example, temporary closures or diversions to footpaths, public rights of way or by affecting enjoyment of recreation spaces or routes such as cycle paths (from noise or visual intrusion) where these are close to works are taking place. Cumulatively, given the distance between options, the preferred programme has been assessed as having moderate negative effects due to the likely impacts of construction. However, these effects are temporary.
13. To protect and enhance human health and well-being.	--/+++	The construction of water resources infrastructure can adversely affect traffic, noise, vibration, air quality and emission. These effects are temporary but can be of scale that is significant to specific locational receptors. However, overall, the impact is not considered to be significant given the distance between options. In the operational phase the effects on health primarily relate to the provision of additional clean drinking water across the Cambridge Water supply area. Therefore, cumulatively a mix of significant positive and moderate negative effects are assessed. The negative effects will largely be temporary.

SEA Objective	Cumulative score	Commentary
14. To promote and enhance the sustainable and efficient use of resilient water resources.	+++	Construction effects on water resilience are considered neutral. The preferred programme of options will help to support the resilience of water resources in the Cambridge Water supply area. The preferred programme will cumulatively support increased water efficiency, leakage reduction, and non-household enhanced metering. This is considered to be a cumulative significant positive effect.
15. To minimise waste, promote resource efficiency and move towards a circular economy.	---	Given the cumulative materials (e.g. concrete, steel and plastics) that will be required to construct the preferred programme of supply options there is likely to be a significant amount of waste generated (although there is some potential for re-use of materials the presence and extent is uncertain). Additionally, the options would generate waste during operation related to chemical use, vehicle movements and energy use. Cumulative significant negative effects have therefore been assessed for this objective.
16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	---	The development of water resources infrastructure may result in indirect (e.g. impacts on setting) adverse effects on the significance of heritage assets including scheduled monuments, listed buildings and registered parks and gardens where they are in close proximity to works. However, many effects would be temporary (i.e. for the duration of construction) and taking into account the scale of construction activity at each site, effects are not predicted to be significant. The preferred programme of options is considered to cumulatively have significant negative effects given the small geographical supply area. As these effects are most likely to be experienced in the construction phase, the majority are considered to be temporary. Some residual effects may be experienced where above ground infrastructure is in the setting of assets.
17. To conserve, protect and enhance landscape and townscape character and visual amenity.	-	The construction and operation of the preferred programme of options would likely have negative effects on landscape/townscape. Many options are within rural or semi-rural landscapes and will likely have negative effects during construction phase. Where works are in close proximity to residential and recreational receptors, construction activity associated with the preferred programme may have short term effects on visual amenity. Where above ground infrastructure forms part of the operational phase there are also likely to be negative effects sustained. There are no designated landscapes in proximity to options included in the preferred programme and overall minor negative cumulative effects are assessed.

6.4 ALTERNATIVE PLAN ASSESSMENT

SEA Regulation 12(2) requires the identification, description and evaluation of "*the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme*". The EC guidance[27] on the SEA Directive discusses possible interpretations of handling 'reasonable alternatives'. It states that "*The alternatives chosen should be realistic. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme*".

[27] EC (2003) *Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment.*

Echoing this, Government guidance[28] for SEA states *"Only reasonable, realistic and relevant alternatives need to be put forward. It is helpful if they are sufficiently distinct to enable meaningful comparisons to be made of the environmental implications of each*".

It is important the draft WRMP has been stress tested for a range of different scenarios to ensure it is robust to changing situations. Where there is uncertainty, the plan would need to be adapted to account for this and Cambridge Water would need to consider an adaptive plan.

Cambridge Water have agreed to common processes for developing their plan with other water companies in WRE to ensure a consistent approach. In line with this methodology, Cambridge Water tested the draft preferred plan under a range of different planning scenarios. This enabled sensitivity testing of the preferred plan to understand if there is a requirement for adaptive planning.

Under all scenarios, there is no change to the preferred plan as it selects all feasible options required to meet the deficit. As a result, there is no available alternative or adaptive plan as part of the WRMP and as such, no further assessment is required.

6.5 SECONDARY, CUMULATIVE AND SYNERGISTIC EFFECTS ASSESSMENT

The SEA Regulations require that the cumulative effects of the draft WRMP24 are assessed. This includes the cumulative effects of the individual preferred options that comprise the preferred programme and the effects of the draft WRMP24 in combination with other plans and programmes.

The cumulative effects of the individual options that comprise the preferred programme of WRMP24 options are presented in **Section 6.3**. This section will therefore consider the cumulative effects of the draft WRMP24 in combination with other plans and programmes, including:

- the draft WRMP24 with other Cambridge Water plans
- the draft WRMP24 with adjacent water company plans , regional plans and projects (SROs);
- the draft WRMP24 as part of the WRE draft Regional Plan;
- the draft WRMP24 with other plans e.g., Local Plans, National Policy Statements (NPSs);
- the draft WRMP24 with other Nationally Significant Infrastructure Projects (NSIPs).

The cumulative effects of the draft WRMP24 are difficult to accurately assess given the inherent uncertainties concerning (inter alia): future changes to baseline environmental conditions; future population and economic growth; the deliverability of some NSIPs (and the potential for new NSIPs to be brought forward); and the proposals of emerging water company WRMPs. As such, it will be necessary to keep under review these factors as the preferred programme is implemented (e.g. in Environmental Impact Assessments (EIA) and HRAs) to ensure that the latest and most up to date information is taken into account.

At the time of drafting this Environmental Report, the draft WRMPs for other water companies were being prepared simultaneously. Where draft WRMPs have been made available, for example through publication for consultation, a cumulative assessment has been undertaken. This section will be reviewed and updated, where necessary, following consultation on the draft WRMPs.

This section sets out:

- cumulative effects assessment with other Cambridge Water plans i.e. the Cambridge Water Drought Plan
- between-company cumulative effects assessment i.e. with other water company WRMPs, Regional Plans, Drought Plans and SROs
- cumulative effects assessment with other plans and programme such as Local Development Plans and National Policy Statements and National/Regional Infrastructure Plans

[28] Office of the Deputy Prime Minister et al (2005) *A Practical Guide to the Strategic Environmental Assessment Directive. Available from* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf [Accessed June 2022]

6.5.1 Cambridge Water Drought Plan 2022

The Cambridge Water draft Drought Management Plan 2022 includes demand management options and a small number of supply-side measures which relate to optimising operations and utilising existing sources.

The period encompassed by the Drought Plan extends to 2027, meanwhile the earliest year of implementation for supply options included in the WRMP24 preferred programme is 2030. As such, the options between plans will not overlap and there is sufficient time to reassess any drought plan options which may be retained in the next iteration post-2027.

6.5.2 Adjacent Water Company Plans, Regional Plans and Projects (WRMPs and SROs)

This section is contingent on access to other adjacent water company draft WRMP24s and regional groups' draft Regional Plans. The Cambridge Water supply boundary is bordered by Affinity Water and Anglian Water and the draft WRMPs each company has published have been reviewed for potential cumulative effects. It is important to note these reports are all currently in the draft stage therefore this section will be reviewed and updated between draft and final to reflect the outcome of consultation.

WRE published their draft Regional Plan for consultation in November 2022. The plan highlights the urgent action required by all sectors to manage the region's scarce water resources and states that as much as 600Ml/d more water may be needed by 2050. The draft Regional Plan proposes an accelerated role out of demand management measures which will eventually be supported by several supply options.

WRE is taking an integrated approach to preparing the Regional Plan and the WRMPs and aims to provide a Regional Plan that is multi-sector and takes account of the water supply needs of non-public water supply (non-PWS) abstractors as well as public water supplies. The Regional Plan has been informed by the proposals for the component draft WRMP24s (Cambridge Water, Anglian Water and Affinity Water) that relate to the area covered by the regional Plan. In consequence, there is likely to be overlap between likely measures within the Regional Plan and those included within the draft WRMP24 and therefore there are likely to be cumulative effects where the plans work together to support effective management of water resources.

At the core of the draft Regional Plan are the two Strategic Resource Options (SRO) that are being promoted through the RAPID gated process: the South Lincolnshire Reservoir and the Fens Reservoir. The Fens Reservoir in the Cambridgeshire Fens will supply Cambridge Water and Anglian Water with 86Ml/d and is anticipated to be available between 2035 and 2037. Option CW24:73a included in the Cambridge Water draft WRMP involves the connection to the SRO and will not result in any cumulative effects as the options are part of the same overall scheme.

A preliminary cumulative assessment was undertaken for the draft WRE Regional Plan which identified potential cumulative effects on waterbodies between options CW24:01A and CW24:01B (also included in Cambridge Water's preferred programme) and options SWC10 and FND21 (included in Anglian Water's draft WRMP). The Cambridge Water WFD assessment concluded that the potential risks would require further investigation prior to the implementation of any of these options and discussions will be required with the WRE regional group as to the pathway for undertaking such investigations. Other potential cumulative effects on shared waterbodies between the individual company options have been assessed as compliant so there would be no additional WFD compliance risks other than those already identified in this plan.

The WRE draft Regional Plan HRA identified several options that impact the Ouse Washes SAC, SPA and Ramsar:

- Transfer of potable water between Bexwell SR (Fenland RZ) and Cherry Hinton SR (Cambridge Water asset) (CAM7).
- Cambs and West Suffolk to Fenland potable transfer (BCTTW125).
- Fens Reservoir Strategic Resource Option (SRO): Earth embanked reservoir with a storage capacity 50 million cubic metres, located in the fens.

These options could act in-combination with the following Cambridge Water draft WRMP24 options:

- CW24-01A: Combined Ouse gravel sources -Fenstanton and St Ives – **construction and operation.**
- CW24-01B: Combined Ouse gravel sources -Fenstanton and St Ives – **construction and operation.**
- CW24-73A: Fens Reservoir potable transfer – Chatteris – **construction only.**

- CW24-75Aiii, Biii, Ciii: AWS potable transfer through CAM area 5, 10, 15Ml/d with main cost and blending plant – **construction only**.

There is no Appropriate Assessment work available for options CAM7 or BCTTW125 in the draft WRE plan, and therefore further work may be required ahead of the final WRMP submission to understand the potential in-combination effects.

Where construction impacts are identified, it is anticipated that the Construction Environmental Management Plans (CEMPs) can adequately address any in-combination effects. The Fens Reservoir SRO concluded adverse effects on its own, and therefore this will require investigation separately.

During operation, there is the potential for in-combination effects from CW24-01A, CW24-01B and the Fens Reservoir SRO. There is uncertainty as to the level of impact on groundwater and resultant surface water flows from the rehabilitation of the borehole (not used since 1999) for CW23-01A and B. The Fens Reservoir SRO requires abstraction from the River Delph and Bedford Ouse at Earith. Adverse effects during operation from the Fens Reservoir SRO alone could not be ruled out. Further investigation is therefore needed for this option. The potential for in-combination effects between these options will be discussed as part of the regional plan work

The WRE Regional Plan may (dependent on locational aspects) lead to additional significant effects in relation to (for example) cultural heritage and landscape, where in combination with regional measures, the plans together would lead to development within (or close proximity to) designated landscapes or construction works take place within or in the settings of designated heritage assets.

The draft WRMP24s of Anglian Water and Affinity Water published for consultation include demand management components, similar to those included in Cambridge Water's draft WRMP24. Improved water efficiency and leakage reduction across East Anglia will provide beneficial cumulative effects in terms of reduced consumption and water abstraction, as well as reduced energy use due to less water pumping and treatment. Anglian Water and Affinity Water will be invited to make comments on the draft WRMP24 and Cambridge Water will continue to engage with these companies as the WRMPs are finalised as part of the WRE group.

A review of other water companies' draft WRMPs outside of the WRE regional group identified no further options with cumulative impacts with those in the Cambridge Water WRMP preferred programme.

6.5.3 Adjacent Water Company Drought Plans

The Cambridge Water supply boundary is bordered by Affinity Water and Anglian Water. The Affinity Water Draft Drought Management Plan 2022[29] identifies a number of demand side options available during times of drought (e.g. publicity campaign to use water wisely; encourage meter optants; and leakage reduction). These initiatives would complement and have beneficial cumulative effects with the demand management schemes included in the draft WRMP preferred programme. It is not considered likely that any of the supply options listed in Affinity Water's Drought Plan will have cumulative effects with the Cambridge Water draft WRMP.

Similarly, the Anglian Water Drought Management Plan 2022[30] identifies demand management activities through enhanced customer communications, water-efficiency promotions, metering and enhanced leakage. The company state that they would review the need to set up regional or national drought groups with neighbouring companies and/or Water UK to enable collaborative approaches as were employed in the 2011-12 drought. These initiatives would complement and have beneficial cumulative effects with the demand management schemes included in the draft WRMP preferred programme. It is not considered likely that any of the supply options listed in Anglian Water's Drought Plan will have cumulative effects with the Cambridge Water draft WRMP24.

6.5.4 Local Development Plans

Potential cumulative effects with Local Plans have been assessed based on plans available in January 2023. Local Plans are relatively high-level policy documents and, whilst they identify potential areas for future development and zones for particular activities, the certainty of developments, the precise spatial location and

[29] Affinity Water (2022) Draft Drought Management Plan 2022. Accessed at: https://affinitywater.uk.engagementhq.com/drought-consultation

[30] Anglian Water (2022) Drought Management Plan 2022. Accessed at https://www.anglianwater.co.uk/siteassets/household/about-us/aws-drought-plan-2022.pdf

their timing make it difficult to identify any specific potential cumulative effects; they would only arise if the timing of the infrastructure required by the WRMP scheme was to coincide.

The 10 preferred plan supply-side options are located across the Cambridge Water supply area and fall within several Local Authority areas: Huntingdonshire, South Cambridgeshire, Cambridge and Fenland. The latest local plans have been reviewed and there are several proposed developments where cumulative impacts with the preferred plan may be possible. These include, but are not limited to:

- Huntingdonshire's Local Plan to 2036 (Adopted 2019)
    - St. Ives West – development of 400 new homes in an area north of the River Ouse (Options 01A and 01B)
- South Cambridgeshire Local Plan (Adopted 2018)
    - Northstowe: New sustainable town development with plans for more than 10,000 homes on the former RAF Oakington site. Local Plan identifies area as a strategic site and includes additional reserve land as an extension to the exiting Northstowe Area Action Plan (Policy SS/5) (Options 75Aiii, 75Biii and 75Ciii)
- Fenland Emerging Local Plan[31] (Unadopted)
    - Several site allocations around Chatteris to support housing and employment growth strategy (Option 73A)

There are still some unknowns surrounding the preferred plan options, including exact locations and construction start dates. At the time of writing, it is not possible to identify all possible potential cumulative effects associated with the local plans. Further review would be undertaken at the detailed design stage if the option were to be implemented.

It is anticipated that any negative impacts could be effectively mitigated through appropriate scheduling of the construction requirements to avoid any concurrent works.

6.5.5 National Policy Statements and National/Regional Infrastructure Plans

There are a number of National Infrastructure Projects listed for the east region[32]. Most are too distant for any potential cumulative effects. Three NSIPs are located within the Cambridge Water supply area. These are East West Rail –Bedford to Cambridge and Western Improvements; Cambridge Waste Water Treatment Plant Relocation; A428 Black Cat to Caxton Gibbet Road Improvement scheme. Cumulative construction effects would only arise if the timing of the infrastructure required by the WRMP scheme was to coincide and would any potential effects are considered small scale. It is anticipated that these impacts could be effectively mitigated through appropriate scheduling of all the construction required so as to avoid any concurrent works.

National Infrastructure Commission (NIC) for the East region has also provided Government with proposals and options to maximise the potential of the Cambridge - Milton Keynes - Oxford corridor as a single cluster. The findings of the draft report[33] indicate that current housing is insufficient to meet current and future needs. This report also finds that transport infrastructure could play a crucial role in overcoming constraints on housing supply and joining up housing and job market areas. This report provides a high level indication of the housing need, but spatial information regarding proposed plans is limited. The reports also provide a high level indication of the strategic overview of the infrastructure requirements. Based on the available information it is possible that the infrastructure and housing upgrades could be in proximity to the supply options included in the draft WRMP.

There is a small risk that simultaneous implementation of the demand management options could lead to cumulative adverse effects with respect to other national or regional infrastructure plans and projects for example those that relate the national road and rail networks. However, any such cumulative effects would be minor, as most of the demand management activities would be localised and small in scale, and could be effectively mitigated through careful project management and best practice construction methods.

[31] Fenland District Council (2022) Fenland Local Plan 2021 – 2040. Draft Local Plan Consultation. August 2022.

[32] https://infrastructure.planninginspectorate.gov.uk/projects/Eastern/

[33] National Infrastructure Commission interim report | Cambridge – Milton Keynes – Oxford corridor. March 2017 (https://www.gov.uk/government/publications/the-national-infrastructure-commissions-interim-report-into-the-cambridge-milton-keynes-oxford-corridor)

6.6 MITIGATION AND ENHANCEMENT

The potential effects of the draft WRMP24 are described in the sections above. In most cases, there are opportunities to reduce some of the potential negative effects identified but this will be subject to further investigation. If and when an option is taken forward for implementation, the detail of any specific mitigation will need to be considered during the planning phases of each individual scheme. This information should be consolidated into a Construction Environmental Management Plan (CEMP) for the scheme, noting that all works should be carried out in accordance with relevant Construction Design Management (CDM) Regulations 2015.

6.6.1 Species Specific Measures and Biodiversity

Most species-specific avoidance or mitigation measures can only be determined at the scheme level, following scheme-specific surveys, and 'best-practice' mitigation for a species will vary according to a range of factors that cannot be determined at this stage. The CEMP should include measures to minimise disturbance to biodiversity during the construction phase, for example:

- scheme design should aim to minimise the environmental effects by 'designing to avoid' potential habitat features that may be important e.g. those used by species that are European site interest features when outside the site boundary (e.g. linear features such as hedges or stream corridors; large areas of scrub or woodland; mature trees; etc.) through scheme-specific routing studies;
- the works programme and requirements for each measure should be determined at the earliest opportunity to allow investigation schemes, surveys and mitigation to be appropriately scheduled and to provide sufficient time for consultations with NE;
- night-time working, or working around dusk / dawn, should be avoided to reduce the likelihood of negative effects on nocturnal species;
- any lighting required (either temporary or permanent) will be designed with an ecologist to ensure that potential 'displacement' effects on nocturnal animals, particularly designated bat species, are avoided;
- all materials will be securely stored away from migratory routes / foraging areas that may be used by designated species;
- all excavations will have ramps or battered ends to prevent species becoming trapped; and
- pipe-caps must be installed overnight to prevent species entering and becoming trapped in any laid pipe-work.

6.6.2 Scheme Design and Planning

All measures will be subject to project-level environmental assessment, which will include assessments of their potential to affect European sites during their construction or operation. These assessments should consider or identify (inter alia):

- opportunities for avoiding potential effects on European sites through design (e.g. alternative pipeline routes; micro-siting; etc);
- construction measures that need to be incorporated into scheme design and or planning to avoid or mitigate potential effects – for example, ensuring that sufficient space is available for pollution prevention measures to be installed, such as sediment traps; and
- operational regimes required to ensure no adverse effects occur (e.g. maintain minimal flows – although note that these measures can only be identified through detailed investigation schemes).

6.6.3 Pollution Prevention

There is a substantial body of general construction good-practice which is applicable to all of the proposed measures and can be relied on (at this level) to prevent significant or adverse effects on a European site occurring as a result of construction site-derived pollutants. The following guidance documents detail the current industry best-practices in construction that are relevant to the proposed schemes:

- DEFRA's Pollution prevention for businesses (https://www.gov.uk/guidance/pollution-prevention-for-businesses);

- Venables R. et al. (2000) Environmental Handbook for Building and Civil Engineering Projects. 2nd Edition. Construction Industry Research and Information Association (CIRIA), London.

The best-practice procedures and measures detailed in these documents should be followed for all construction works derived from the draft WRMP24 as a minimum standard, unless scheme-specific investigations identify additional measures and / or more appropriate non-standard approaches for dealing with potential site-derived pollutants.

Care should also be taken during construction regarding the potential for contaminants such as silt, concrete or fuel oil to pollute water courses via surface run off. This can be mitigated by undertaking all construction activities in accordance with relevant best practice pollution prevention guidance. Pollution Incident Control Management Plans should be developed to limit adverse effects arising from pollution events.

6.6.4 Air Quality

With regard to the potential for effects on air quality, the following measures should be considered for inclusion within the CEMP:

- Cambridge Water should consider the use of low emission plant, air quality monitoring and preparation of a Dust Management Plan;
- a Construction Traffic Management Plan (CTMP) could be prepared for each preferred supply option to manage the traffic impacts associated with construction which would include measures to mitigate air quality effects including routing of traffic to avoid sensitive receptors and the timing of HGV movements to avoid peak traffic hours;
- low emission/electric vehicles should be used during the construction and operational phases where possible, consistent with the Water UK Net Zero 2030 Route Map.

6.6.5 Effects on Human Health and Social and Economic Well-being

With regard to the potential for effect on health, social and economic well-being, Cambridge Water and its contractors are enrolled in the Considerate Constructors Scheme, a voluntary scheme which commits those contractors in the Scheme to be considerate and good neighbours, as well as clean, respectful, safe, environmentally conscious, responsible and accountable. The following measures should be considered for inclusion within the CEMP:

- care should be taken to avoid works near to the most sensitive health receptors in the development of detailed designs for pipeline routes;
- routing of traffic to avoid sensitive receptors and the timing and phasing of HGV movements to avoid peak traffic hours;
- construction activities should be undertaken so as to minimise short term adverse effects on recreational areas, such as footpaths, and on landscape and biodiversity.

To maximise economic benefits in the Cambridge Water area, it is recommended that, where possible, work is carried out by local firms and contractors or by those with a policy for training and skills development that could help contribute to the local economy and meet employment needs. Where possible, Cambride Water should seek to use locally-sourced materials.

6.6.6 Effects on Climate Change and Resource Use

To help Cambridge Water respond to the challenges of climate change, noting that greenhouse gas emissions are a likely significant effect identified by the SEA, a Carbon Management Plan should be developed. This should be consistent with Cambridge Water's commitment to achieve net zero emissions by 2030, which is aligned with the Water UK Net Zero 2030 Route Map and could include:

- the provision of on-site renewables during both the construction and operational phases of the sub-options;
- adoption of high quality, sustainable design principles to maximise energy efficiency in new infrastructure;
- use of low emission and electric vehicles in construction and operational fleets;
- use of low emission plant during construction;

- provision of enhanced carbon sequestration as part of biodiversity enhancement measures; and
- offsetting of all residual carbon emissions.

Design measures should be adopted to ensure the long-term resilience of infrastructure to the effects of climate change. Measures may include, for example, the provision/enhancement of natural flood management measures as part of wider biodiversity enhancement and habitat creation.

Where significant raw materials are required for options, this can be mitigated by utilising recycled and locally sourced materials. Construction and operational wastes should also be reused/recycled where appropriate.

6.6.7 Effects on Cultural Heritage and Landscape

The potential for adverse impacts of the settings of cultural heritage assets should be considered early in the design process and any adverse effects minimised, for example through micrositing/ alternative pipeline routes to avoid designated sites. Further measures, for consideration within the CEMP could include:

- careful consideration being given to the presence of heritage assets when finalising proposals for pipeline routing;
- where required, a programme of trial trenching and archaeological recording should be undertaken at development sites, with results disseminated;
- new above-ground infrastructure should be screened, where possible and informed by informed by a heritage appraisal/assessment, to minimise effects on the settings of heritage assets;
- consideration should be given to enhancing the significance of, and access to, heritage assets.

Proposed draft WRMP24 schemes could have a negative effect on landscape if new infrastructure is required, particularly where development cannot be located on previously developed land and/or where schemes are located within landscapes recognised for their importance and special qualities (National Parks and AONBs). In order to minimise such effects, new structures could be located close to existing structures or hedgerows and trees to provide some screening with the potential to utilise local building styles or incorporate landscaping schemes (e.g. tree/ hedge planting). Further measures, for consideration within the CEMP could include:

- where required, proposals should be accompanied by a lighting strategy that is designed to minimise outward glows;
- new above ground infrastructure should adopt high quality design principles where possible (for example, the use of local materials);
- where appropriate, proposals should be accompanied by a landscape mitigation plan, informed by a landscape and visual assessment.

6.7 CONCLUSIONS

The draft WRMP24 sets out the proposals Cambridge Water plans to undertake to maintain the balance between available water supply and demand over the next 25 years and beyond. The WRMP is focussed on delivering targets to halve leakage and reduce customer consumption to 110 litres per person per day by 2050. In addition, the plan targets 9% reduction of non-household consumption by 2037, in line with the proposed Environment Act target. Underpinning this is the company's programme of universal metering it is proposing to undertake, which will provide invaluable information to support changes to customer behaviour as well as aiding with the targeting and delivery of leakage reductions.

The draft WRMP24 proposes to implement ten supply options and three demand options across the Cambridge Water supply area to meet the supply demand deficit. Cambridge Water have tested the draft preferred plan by applying a number of scenarios relating to alternative futures covering some key uncertainties, including the impacts of climate change. Under all scenarios, the preferred plan selected the same feasible options required to meet the deficit and, as a result, there is no alternative or adaptive plan.

Overall, the draft WRMP24 is expected to generate significant positive effects across several SEA objectives including economy (SEA Objective 11), human health and well-being (SEA Objective 13) and water resources (SEA Objective 14) and the provision of over 140Ml/d of clean drinking water which would support economic growth whilst maintaining a healthy and sustainable populations.

The Cambridge Water preferred programme have potentially WFD non-compliant impacts associated with the operation of one option. The WFD compliance assessment concludes that two waterbodies may be impacted

as operation of the option results in the interception of rainwater in the catchment where these waterbodies are designated as having no water available for abstraction. There is low confidence in this assessment due to the limited baseline hydrological understanding which can be improved through further investigation into the potential impacts on WFD elements.

The HRA has provisionally concluded that there are sufficient standard and best practice mitigation measures that can be implemented during construction to avoid adverse effects for the supply side options. Further hydrological assessment and surveys to confirm presence and use of offsite functionally linked habitat will be required for a number of options ahead of project-level HRAs.

For demand options, the HRA concluded that these measures are likely to require some form of physical intervention or amendment to infrastructure (e.g. pipe repair), some instances of effect pathways might be conceivable but it is not possible to predict or identify specific locations where such measures might be applied and so effects on specific European sites cannot be identified. However, it is very likely that adverse and/or significant effects could be avoidable at a scheme level; Therefore, from an HRA perspective, the options are 'screened in' (as an effect pathway is conceivable) but as a meaningful appropriate assessment is not possible, the assessment is necessarily deferred to the project level.

Where negative effects have been identified, generally, these are expected to be either minor or moderate only, although uncertainties remain. The exception to this is in respect of soils, land use and geology (SEA Objective 4), greenhouse gas emissions (SEA Objective 9), resource use (SEA Objective 15) and cultural heritage (SEA Objective 16) where significant negative effects have been identified during construction. However, these effects reflect the emissions to air, energy and resource use associated with the implementation of the water management measures which is to a large extent unavoidable (although effects may be reduced at the project stage through, for example, the use of renewable energy and sustainably sourced construction materials). Significant negative effects on soils and land use and cultural heritage may be mitigated through best practice construction methods as well as scheme specific mitigation or re-siting of pipeline routes and other infrastructure. Further review of these effects will need to be considered at project level therefore uncertainties still remain.

Detailed mitigation and enhancement measures have been identified to help avoid, minimise, reduce or mitigate effects where identified.

7. NEXT STEPS

7.1 CONSULTATION ON THIS ENVIRONMENTAL REPORT

This Environmental Report is being issued for consultation. We would welcome views on any aspect of this report.

Please provide your comments by 14 May 2023.

Please e-mail your responses to WRMP.ConsultationCAM@south-staffs-water.co.uk.

7.2 NEXT STEPS

Following consultation on the draft WRMP24, Cambridge Water will prepare a Statement of Response to the representations received during the consultation period setting out how and why the draft plan has or has not been revised to take account of the consultation responses. Cambridge Water will amend the draft plan and depending on whether changes are considered significant may undertake further consultation supported by further assessment. Subject to the approval of the Secretary of State, Cambridge Water will then publish the final WRMP24. The programme of measures will be implemented accordingly. In conjunction with publishing the final WRMP24, a Post Adoption Statement will also be issued (to meet the requirements of SEA regulation 16 (4)). This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final plan.

7.3 HOW ENVIRONMENTAL EFFECTS WILL BE CONSIDERED DURING PLAN IMPLEMENTATION

Once the final WRMP24 has been published, the selected schemes for water resource management will need to be implemented through specific projects. As part of this process, each project may be subject to further assessment to understand and manage its potential environmental and social impacts. These assessments, which may include HRA and EIA, will take account of the issues discussed in this report but will also be informed by the greater detail available as the work progresses about construction techniques, building materials, and agreed locations and routes.

7.4 MONITORING THE EFFECTS OF THE WRMP

Once the WRMP24 is implemented and specific options deployed, its effects on the environment and people will need to be taken into account. In this regard, it is a requirement of the SEA Regulations to establish how the significant effects of the WRMP24 will be monitored. Monitoring can help to answer questions such as:

- Were the SEA predictions of effects accurate?
- Are mitigation measures performing as well as expected?
- Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?

It is not necessary to monitor everything or monitor an effect indefinitely. Instead monitoring should be focussed on:

- significant effects that may give rise to irreversible damage, with a view to identifying trends before such damage is caused; and
- significant effects where there was uncertainty in the SEA and where monitoring would enable preventative or mitigation measures to be undertaken.

Cambridge Water expects to monitor the effects of the WRMP24 alongside the other impacts of its operations, and as such, is likely to rely on existing sources of information that are collected either by Cambridge Water or by other relevant organisations such as the Environment Agency and Natural England. For example, Cambridge Water already collects certain data for an annual review process (the Annual Performance Report) that is submitted to the Office of Water Services (Ofwat) and their own environmental reporting.

Table 7.1 indicates some of the issues currently monitored or which could be monitored in future, and how they relate to the SEA objectives used in the SEA of the draft WRMP24. This list is provisional and indicative

only; monitoring proposals will be considered further and a final monitoring framework that satisfies the requirements of the SEA Regulation will be presented in the Post Adoption Statement.

Table 7.1 Potential Indicators for Monitoring Effects

SEA Objective	Potential Indicator	Source of Information	Commentary
1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	Condition of specific protected sites (e.g. SACs, SPAs, SSSIs)	Cambridge Water (CW), Environment Agency, Natural England (NE)	Additionally, open communication between Environment Agency, NE and CW results in up-to-date information and identification of any potential issues.
2. To protect and enhance sustainable natural resources and the ecosystem services they provide.	Biological monitoring (macroinvertebrates, macrophytes, fisheries, bird surveys)	CW, EA, Angling clubs, British Trust for Ornithology (BTO)	Using 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.
	Number and area of new or restored habitats	CW	CW could consider recording the number of locations and area of habitats created or restored
3. To avoid and, where required, manage invasive and non-native species (INNS).	INNS presence	CW, NBN Atlas and the EA's Ecology & Fish Data Explorer website	
4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.	Area of previously undeveloped land used during construction	CW	CW could record the area of previously undeveloped land that is built on as a result of the WRMP24 scheme (linked to biodiversity net gain/resilience assessment).
	Condition of sites designated for geological interest (e.g. geological SSSIs) on water industry land holdings	CW, NE	Previous studies may also be used to inform monitoring and assessment.
5. To protect and enhance surface and ground water levels and flows.	River flows, river levels, lake and reservoir levels. Groundwater levels, recharge characteristics and abstracted groundwater quality	CW, EA	
6. To protect and enhance the quality of surface and groundwater resources.	Water quality of surface and ground water.	CW, EA	Previous studies may also be used to inform monitoring and assessment.
7. To reduce or manage flood risk.	Number of properties that experience internal flooding from public sewers	CW, EA	CW report these data to Ofwat as part of the statutory returns process.

SEA Objective	Potential Indicator	Source of Information	Commentary
8. To minimise emissions of pollutant gases and particulates and enhance air quality.	Number of vehicle movements/distance travelled	CW	CW could consider recording the number of vehicle movements and distance travelled as an indicator of air quality impacts during implementation.
9. To reduce greenhouse gas emissions.	Quantity of greenhouse gas emissions per megalitre of water supplied.	CW	CW can use company data, and guidance from the UKWIR greenhouse gas workbook and BEIS (Department for Business, Energy & Industrial Strategy) conversion factors to derive this information.
	Energy use used in the operation of options.	CW	CW energy consumption data e.g. via accounts / invoices.
	Renewable energy generated or purchased.	CW	CW renewable energy generation data, in addition to data on renewable energy purchased e.g. via accounts / invoices.
10. To adapt and improve resilience to the threats of climate change.	Number of properties that experience internal flooding from public sewers	CW, EA, NRW	CW report these data to Ofwat as part of the statutory returns process.
11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	Number of SSW sites with public access which provide sporting, recreational and leisure resources and number of visits per year.	CW	CW hold information on the number of annual visitors to sites where specific visitor facilities are provided. These could be analysed to determine effects of operation on visitor use.
	Planned residential new development (informing predicted growth forecast to target catchments requiring investigations for potential future capacity constraints).	CW	CW examine information on planned growth and forecasts across Local Planning Authorities within the area.
12. To maintain and enhance tourism and recreation.	Number of SSW sites with public access which provide sporting, recreational and leisure resources and number of visits per year.	CW	
13. To protect and enhance human health and well-being.	Compliance with drinking water standards at customers' taps (%).	CW	CW reports these data to Ofwat as part of the statutory returns process (Annual Performance Report) and to the Drinking Water Inspectorate.
	Compliance with water quality standards under the EC Bathing Waters Directive.	Environment Agency	Environment Agency monitors the compliance of bathing waters and report this annually.
	Number of nuisance-related complaints e.g. noise, dust.	CW	CW could record the number of nuisance-related complaints made in relation to implementation of the WRMP24.

SEA Objective	Potential Indicator	Source of Information	Commentary
	Pollution and flooding Incidents	CW, Environment Agency	CW measure the number of pollution incidents per year and keep a record of all flooding incidents per year and maintain a list of intermittent discharges.
14. To promote and enhance the sustainable and efficient use of resilient water resources.	Leakage Water saved through demand management/ water efficiency measures	CW	CW report these data to Ofwat as part of the annual returns process.
15. To minimise waste, promote resource efficiency and move towards a circular economy.	Amount of recycled / reused materials used	CW (contractors/consultants)	Information on the use of recycled / reused materials should be held by construction managers and accounts (contractors / consultants accounts, waste or procurement records).
	Proportion of waste sent to landfill	CW (services data)	Information on waste disposal to landfill should be held by CW.
	Chemical use in water treatment	CW (services data)	Information (quantities, composition) on chemical use should be held in accounts.
16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	Loss / damage or discovery / protection of cultural, historic and industrial heritage features.	CW, Historic England	Historic England monitor the condition of all statutorily protected monuments.
17. To conserve, protect and enhance landscape and townscape character and visual amenity.	Loss or damage to landscape character and features of designated sites.	CW	CW could record the number and size of infrastructure built within designated landscape sites.

This section will be updated between draft and final WRMP

8. GLOSSARY

Term	Definition
AIC	Average Incremental Cost. A unit cost used to compare different water resources options. Calculated from the option's future costs, discounted over time, and divided by the supply demand benefits similarly discounted. Normally expressed in units of pence per cubic metre of water.
Alternative plans	A plan, within the context of a WRMP, is a selection of options with a schedule of implementation dates which meet the objectives required. Different plans can be compared through consultation and they would usually be presented as a preferred plan and alternative plans.
Adaptive plan	An adaptive plan is one which responds to future uncertainties by setting out a sequence of manageable steps or decision-points over time. At each decision-point the plan could follow two or more different *pathways*. Each pathway would specify the options needed and implementation dates to meet the objectives in a particular future state. The full range of pathways in an adaptive plan can then be shown to allow stakeholders to understand how different options could be needed in the future.
Constrained options	The list of options remaining after two stages of screening: *high-level screening* and *detailed screening.* These options are suitable candidates for selection and are part of the *preferred plan* or *alternative plans*.
Decision making metrics	Decision making metrics are properties of each water resources option which are given a numerical value to indicate how well the option performs. Metrics are specified in relation to the objectives to be achieved in the plan. For example, they might include measures of cost, supply demand benefits and environmental benefits. Each metric is a criterion when multi-criteria analysis is used.
Detailed screening	A process in which if, during more detailed consideration of the *revised feasible options*, constraints that make an option unsuitable for promotion are identified, then that option is removed from the list. The outcome of detailed screening is the list of *constrained options.*
Feasible options	A set of options that are considered to be suitable to assess for inclusion in the preferred plan. Feasible options are identified from a longer list of *unconstrained options* by a process of *high-level screening* to remove options with unalterable constraints that make them unsuitable for promotion.
High-level screening	The process where unconstrained options are filtered using a set of screening criteria. Any options with unalterable constraints that make them unsuitable for promotion are identified and removed from the list. Defined screening criteria are used to ensure options are screened consistently. The output of high-level screening is the set of feasible options.
Revised feasible options	A subset of the feasible options, post AIC cuts which are considered in more detail through the decision making process. The list of revised feasible options is generated by high level screening.
Multi-criteria analysis (MCA)	Multi-criteria analysis is a structured approach to determine overall preferences among alternative options, where the options accomplish several objectives. It can also be used to explicitly explore the trade-offs between different candidate plans to inform the selection of preferred or *alternative plans*.
Plan pathway	A pathway within an *adaptive plan*.

Term	Definition
Preferred options	The set of water resources options included in the *preferred plan*.
Preferred plan	Comprises a set of options and a schedule of dates for implementing these options. These options have been selected through the planning process and evidence provided as to why they perform better against the objectives of the plan. Sometimes also referred to as the preferred programme of options.
Detailed screening	A step following *high-level screening* and the completion of the determination of the AIC to further reduce the number of *feasible options* being considered in detail through the decision making. Its purpose is to reduce complexity, resource requirements and computational burden without affecting the final plan. It therefore seeks to remove those options which would not in any case be selected as part of the best value plan The output of detailed screening is the set of constrained options.
Unconstrained list of options	All the possible options that could reasonably be used in the plan. This will include all the options considered in the previous planning round, as well as any options that have been identified since.
Water Resource Zone	Section 4.4. of the draft WRPG defines a water resource zone as "*an area within which the abstraction and distribution of water to meet demand is largely self-contained (with the exception of agreed bulk transfers)*".

APPENDICES

APPENDIX A QUALITY ASSURANCE CHECKLIST

Quality Assurance Checklist	
Objectives and Context	
The plan's or programme's purpose and objectives are made clear.	The purpose of the draft WRMP24 is set out in **Section 1.3** of this Environmental Report. The objectives of the draft WRMP24 are set out in **Section 1.3.**
Environmental issues and constraints, including international and EC environmental protection objectives, are considered in developing objectives and targets.	Key environmental issues identified through a review of relevant plans and programmes (see **Section 2** and **Appendix C** of this report) and analysis of baseline conditions (see **Section 3 and Appendix D**) have informed the development of the assessment framework presented in **Section 4.3**.
SEA objectives, where used, are clearly set out and linked to indicators and targets where appropriate.	SEA objectives and guide questions are set out in **Section 4.3**of this report. Quantitative and qualitative thresholds of effects provide values for neutral, minor, moderate and significant effects (**Appendix E**).
Links with other related plans, programmes and policies are identified and explained.	Links are identified in **Section 2** and **Appendix C**.
Conflicts that exist between SEA objectives, between SEA and plan objectives and between SEA objectives and other plan objectives are identified and described.	The relationships between the SEA, WRMP24 and other plan objectives have been identified in the review of plans and programmes included in **Appendix C**.
Scoping	
Consultation Bodies are consulted in appropriate ways and at appropriate times on the content and scope of the Environmental Report.	The SEA Scoping Report was consulted upon and responses to this are included in this Environmental Report (see **Appendix B**).
The assessment focuses on significant issues.	The scope of the assessment reflects the geographic extent of the WRMP24 area and provides a comprehensive approach to assessment (reflecting the large number of interactions dependent on the continued supply of water). This enables the assessment to determine which impacts will be considered significant.
Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.	General difficulties, limitations and assumptions are set out in **Section 4.5** of this report. Baseline data limitations are discussed in **Section 3.3**
Reasons are given for eliminating issues from further consideration.	The proposed scope of the assessment is set out in **Section 4.2**. All SEA topics have been scoped in to the assessment.
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.	This is covered in **Section 6** and **Appendix F** of this report.

Quality Assurance Checklist	
Alternatives include 'do minimum' and/or 'business as usual' scenarios wherever relevant.	A 'do minimum' and/or 'business as usual' scenario is not appropriate for the draft WRMP due to the need to provide sufficient water to customers.
The environmental effects (both adverse and beneficial) of each alternative are identified and compared.	This is covered in **Section 6** and **Appendix F** of this report.
Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained.	No inconsistencies were identified.
Reasons are given for selection or elimination of alternatives.	This is set out in **Section 6.4** of this report
Baseline Information	
Relevant aspects of the current state of the environment and their likely evolution without the plan or programme are described.	**Section 3** and **Appendix D** of this report characterises the current environmental baseline conditions, along with how these are likely to change in the future.
Environmental characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the plan area where it is likely to be affected by the plan.	The environmental characteristics of the WRMP24 area are described in **Section 3** and **Appendix D** of this report.
Difficulties such as deficiencies in information or methods are explained.	Baseline data limitations are discussed in **Section 3.3**. Further difficulties and limitations are set out in **Section 4.5**.
Prediction and Evaluation of Likely Significant Environmental Effects	
Effects identified include the types listed in the Directive (biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material assets, cultural heritage and landscape), as relevant; other likely environmental effects are also covered, as appropriate.	The potential effects of the options are identified in **Section 5** and **Appendix F and Appendix G**.
Both positive and negative effects are considered, and the duration of effects (short, medium or long-term) addressed.	The nature and duration of potential effects has been set out in the detailed assessment matrices contained in **Appendix F and Appendix G** of this report.
Likely secondary, cumulative and synergistic effects are identified where practicable.	Information on secondary, cumulative and synergistic effects is set out in **Section 6.5**.
Inter-relationships between effects are considered where practicable.	These relationships are identified where appropriate in the detailed assessment matrices contained in **Appendix F and Appendix G** of this report.
The prediction and evaluation of effects makes use of relevant accepted standards, regulations, and thresholds.	Relevant standards have been used where appropriate in undertaking the assessment.
Methods used to evaluate the effects are described.	Information on the methods used for evaluation of potential effects is included in **Section 4** and in the detailed assessment matrices contained in **Appendix F and Appendix G** of this report. The definitions of significance used in the assessment are set out in **Appendix E**.

Quality Assurance Checklist	
Mitigation Measures	
Measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the plan or programme are indicated.	Mitigation measures for potential negative effects will be set out in **Section 6.6** and, where possible,in the commentary to the matrices in **Appendix F and Appendix G** once all assessments are complete.
Issues to be taken into account in project consents are identified.	Issues to be taken into account in project consents, where relevant are included in **Section 6.6** and in the commentary to the matrices in **Appendix F and Appendix G**
The Environmental Report	
Is clear and concise in its layout and presentation.	We believe the report is clear and concise, reflective of the information in the draft WRMP.
Uses simple, clear language and avoids or explains technical terms.	The report uses accessible language wherever possible.
Uses maps and other illustrations where appropriate.	Maps and illustrations have been utilised in the report.
Explains the methodology used.	The method used is set out in the report in **Section 4**.
Explains who was consulted and what methods of consultation were used.	**Appendix B** of this report outlines the consultation that has been carried out to-date.
Identifies sources of information, including expert judgement and matters of opinion.	Sources of information are included throughout the report.
Contains a non-technical summary covering the overall approach to the SEA, the objectives of the plan, the main options considered, and any changes to the plan resulting from the SEA.	A Non-Technical Summary has been included as part of the report.
Consultation	
The SEA is consulted on as an integral part of the plan-making process.	The previously issued SEA Scoping Report was consulted upon and responses are included in this Environmental Report (see Appendix B).
Consultation Bodies and the public likely to be affected by, or having an interest in, the plan or programme are consulted in ways and at times which give them an early and effective opportunity within appropriate time frames to express their opinions on the draft plan and Environmental Report.	Consultation on the draft WRMP and this Environmental Report will be undertaken by the water company.
Decision-making and Information on the Decision	
The Environmental Report and the opinions of those consulted are taken into account in finalising and adopting the plan or programme.	This will be incorporated following consultation on draft WRMP24 and Environmental Report.
An explanation is given of how they have been taken into account.	This will be provided following consultation on the draft WRMP24 and Environmental Report.
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered.	This will be set out following consultation on the draft WRMP24 and Environmental Report.
Monitoring Measures	

Quality Assurance Checklist	
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA.	The report will set out potential monitoring measures that could be used in **Section 7.4** once a preferred plan and alternatives have been decided.
Monitoring is used, where appropriate, during implementation of the plan or programme to make good deficiencies in baseline information in the SEA.	The suggestions for monitoring will be included in **Section 7.4** of the report. *This section will be updated between draft and final.*
Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects may include predictions which prove to be incorrect.)	The suggestions for monitoring made in **Section 7.4**are for the water company to act on, with monitoring taking place following implementation of the WRMP24.
Proposals are made for action in response to significant adverse effects.	Mitigation methods will be outlined for the preferred options in **Section 6.6** of this report and **Appendix G.** *This section will be completed between draft and final.*

APPENDIX B SCHEDULE OF CONSULTATION RESPONSE

Consultation response from the Environment Agency to the SEA Scoping Report submitted in April 2022.

	Criteria for consideration	RAG rating (R = non compliance, A = areas of deficiency, G = compliant)	Description of how the SEA scoping report has met this criteria and any areas for improvement.	Ricardo Response
1	Has the water company correctly determined the requirement to carry out an SEA?	G	Flow chart documenting that the screening undertaken to determine an SEA is required, is included in Figure 1.1 of the report.	No response required
2	Does the Scoping Report outline an appropriate study area and baseline (including current and future baseline)?	A	2.2.1 sets out assessment area for SEA, but no indication of buffers for any SEA topics e.g. buffer to consider cross boundaries effects for protected sites? Limitations of data set out in 4.1.1. Limited info on some baseline e.g. biodiversity lists the number of protected sites, but no indication on their condition? Future baseline section included for each topic. Use of maps to show data in SEA topics. Landscape topic - key issues refer to protecting area's national parks, but none in study area? Reference included to interrelationship between topics and how this will be looked at in the assessment.	Final option information was unavailable during the scoping stage so details of specific sites which have the potential to be impacted was unknown. The SEA set the area under consideration as the Cambridge Water supply area to capture these. A note was added that if any cross boundary options e.g. water transfers were included in the final set of options, then the Environmental Report would reflect this. Section 4.1.1 of the Scoping Report sets out that SEA is a high level assessment of potential environmental concerns therefore it is not considered appropriate to reflect their condition at the scoping stage. At an assessment level, sites that have the potential be impacted have been reviewed and their current condition considered. The Landscape section refers to National Parks for background information on the Landscape topic in general. The section further goes on to outline any significant landscape assets in the area which include country parks. This section has been reviewed for clarity during preparation of the Environmental Report.

	Criteria for consideration	RAG rating (R = non compliance, A = areas of deficiency, G = compliant)	Description of how the SEA scoping report has met this criteria and any areas for improvement.	Ricardo Response
3	Does the Scoping Report identify key issues and provide those scoped in/out?	A	Key issues for each SEA topic are identified in the baseline chapter. However, there is no reference to scoping of the topics or sub topics and whether any have been scoped out at this stage. It is assumed none scoped out, given the key issues identified. A summary of the key issues across all topics would be useful. A presentation style point to note, the majority of the issues are written in the style of actions as result of the issues e.g. 'The need to....' Would be good to distinguish opportunities from key issues identified in the baseline.	Correct - no topics have been scoped out at this stage as final option information was unavailable at the time of scoping. This has been made clear in the Environmental Report. A table has been added to the Environmental Report to summarise the key issues identified across all SEA topics. Narrative has been reviewed at this stage to distinguish opportunities from key issues where appropriate.
4	Does the Scoping Report include a PPP review? Are there any PPPs that we would expect to be covered that haven't been? Has the outcome of the PPP review been used to inform assessment methodologies and focus?	G	Yes PPP review undertaken - comprehensive detail in Appendix and summary table included in section 3.1 and key messages taken from the review per SEA topic to inform SEA objectives in the assessment framework. No reference to Anglian Flood Risk Management Plan (FRMP) under Water topic?	Comment noted. Anglian FRMP has been added to PPP review in preparation of Environmental Report.
5	Is it clear how the SEA will be used to influence the development of the plan being produced, how has sustainability been used to influence plan development to date?	A	Staged approach to assessment set out in section 5.2 and sections 7.1/7.2 provide further detail on how the SEA will influence the appraisal of options and section 8.2 states that the SEA findings will be 'an integral part of the best value planning approach' to the WRMP. No mention of how sustainabillity has influenced plan development to date. Reference to the continuation of the 'twin track' approach to the WRMP in section 7.2; can this be confirmed at this stage before options appraisal?	The Scoping Report sets out the review of plans and programmes and policy objectives, the baseline, key issues identified across the SEA topics for the Cambridge Water study area and the draft methodology for the SEA of the plan. How the SEA has informed the development of the plan is further documented within the Environmental Report and the Post-adoption Statement. The Environmental Report references as appropriate to the 'twin track' approach that is being followed to address the supply-demand deficit, with demand management and supply options. Sustainability is a key criteria for assessment across the SEA objective (as provided in Appendix E of the Environmental Report) and referenced, where appropriate throughout.

	Criteria for consideration	RAG rating (R = non compliance, A = areas of deficiency, G = compliant)	Description of how the SEA scoping report has met this criteria and any areas for improvement.	Ricardo Response
6	Does the Scoping Report set out an SEA assessment methodology that is appropriate and describes how alternatives will be assessed and considered?	A	SEA assessment objectives set out in main document, and prompt questions. Some of the prompt questions don't seem relevant and informed by the baseline review, e.g reference to coastal erosion? (no coast in study area?). Climatic factors - no mention of contribution to net zero carbon? Some links to WRW are not relevant to e.g. under cultural heritage, reference to Welsh language. Reference to protection of AONBs and National parks, but none in study area. Ensure objectives and prompt questions reflect the CW assessment area baseline. How does the WRW framework differ from the WRE framework, given that this is within WRE area too? Does this need to be considered in the assessment framework? Consider use of colour palettes for matrices to ensure colours are clearly distinguishable from each other. Significance clearly defined in report and appendix B. Information included regarding other assessments (e.g. BNG, WFD) are fed into the SEA (predominantly through the objectives reflecting the assessments undertaken). Section 8.2 implies that alternatives may need to be considered (reference to determining if it is necessary to consider alternative options). Please note that reasonable alternatives will need to be considered in the SEA at the assessment stage.	Comment noted. The assessment area is indeed within the WRE area but the methodology intentionally includes the SEA methodology for the South Staffs WRMP24/WRW. The objectives/prompt questions have been reviewed and those prompts not relevant to the study area have not been used during the assessment stage. This has been documented within the Environmental Report. The Policy Context section and Environmental baseline review of the Scoping Report mention net zero in several places. SEA objectives concerning the reduction in greenhouse gas emissions along with the improvement of climate resilience are included in the Assessment Framework, along with associated guide questions and thresholds. The WRE assessment framework has been reviewed when drafting the Environmental Report. An example of the colours to be used in matrices is provided in the Environmental Report. Consideration has been given to further distinguish between scores. Alternatives will be considered in the Environmental Report once the preferred plan has been identified. Wording has been amended accordingly for the Environmental Report.

APPENDIX C REVIEW OF PLANS AND PROGRAMMES

The findings of the review of policy, plans and programmes are set out in **Table C-1.** This table sets out the purpose and objectives of the policies, plans and programmes, their potential relationship with Cambridge Water's WRMP, and the potential implications for the objectives of the SEA.

Table C-1 Summary of the Policy, Plans and Programmes reviewed and their link to the Strategic Environmental Assessment

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
International	
Council of Europe (1979) *The Convention on the Conservation of European Wildlife and Natural Habitats (The Bern Convention)*	
International convention which aims to ensure conservation of wild flora and fauna species and their habitats. Special attention is given to endangered and vulnerable species, including endangered and vulnerable migratory species specified in appendices. Enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).	The potential impacts of the WRMP options on internationally designated sites, species and important Bird habitats must be considered as part of the SEA.
Council of Europe (1985) *Convention for the Protection of the Architectural Heritage of Europe (Granada Convention)*	
To reinforce and promote policies for the conservation and enhancement of Europe's heritage.	The SEA should take into account the need to conserve heritage.
Council of Europe (1992) *Convention on the Protection of Archaeological Heritage (Valetta Convention)*	
This Convention sets out a revised body of new basic legal standards for Europe to the previous Granada Convention, to be met by national policies for the protection of archaeological assets as sources of scientific and documentary evidence. It makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies.	The SEA should take into account the need to conserve heritage.
Council of Europe (2000) *European Landscape Convention (Florence Convention)*	
The European Landscape Convention is an international convention focusing specifically on landscape. The UK Government signed the European Landscape Convention in 2006 and it became binding from March 2007.	The SEA should take landscape quality into account and include water quality in the assessment framework.
Council of Europe (2003) *European Soils Charter*	
Sets out common principles for protecting soils across the EU and will help.	The SEA should seek to ensure that the quality of the regions land, including soils, is protected or enhanced.
European Commission (1991) The Nitrates Directive (91/676/EEC)	
The Nitrates Directive is designed to reduce water pollution caused by nitrate from agriculture. The directive requires Defra and the Welsh Assembly Government to identify surface or groundwaters that are, or could be, high in nitrate from agricultural sources.	The WRMP should be consistent with the aim to reduce water pollution caused by nitrate from agriculture.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Once a water body is identified as being high in nitrate all land draining to that water is designated a Nitrate Vulnerable Zone. Within these zones, farmers must observe an action programme of measures which include restricting the timing and application of fertilisers and manure and keeping accurate records.	The SEA assessment framework should include water quality.
European Commission (1991), *Urban Waste Water Treatment Directive (1991/271/EC)*	
The Directive's objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors and concerns the collection, treatment and discharge of domestic waste water, mixture of waste water and waste water from certain industrial sectors.	The SEA should seek to maintain, protect and improve water quality across the region.
European Commission (1992) *Habitats Directive (1992/43/EC)*	
The aim of the Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance.	The impacts of the WRMP options on internationally designated sites and species must be considered as part of the SEA.
European Commission (1998), *Drinking Water Directive (1998/83/EC)*	
The objective of the Drinking Water Directive is to protect the health of the consumers in the European Union and to make sure the water is clean and of good quality. To make sure drinking water everywhere in the EU is healthy, clean and tasty, the Drinking Water Directive sets standards for the most common substances (so-called parameters) that can be found in drinking water. A total of 48 microbiological and chemical parameters must be monitored and tested regularly.	The SEA should seek to ensure that objectives address water quality in the region, particularly drinking water quality.
European Commission (1999) *Landfill of Waste Directive (99/31/EC)*	
The Directive aims at reducing the amount of waste landfilled; promoting recycling and recovery; establishing high standards of landfill practice across the EU and preventing the shipping of waste from one Country to another. The objective of the Directive is to prevent or reduce as far as possible negative effects on the environment (in particular on surface water, groundwater, soil, air and human health) from the landfilling of waste, by introducing stringent technical requirements for waste and landfills.	The WRMP should take the effects on waste to landfill into account. The SEA assessment should consider the effects on water, soil, air, human health, and waste.
European Commission (2000), *The Water Framework Directive (2000/60/EC)*	
This Directive establishes a framework for the protection of inland surface waters, transitional waters, coastal water and groundwater. It also encourages the sustainable use of water resources. Key objectives are general protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water.	The SEA should seek to promote the protection and enhancement of all water resources.
European Commission (2001) *Directive on the assessment of the effects of certain plans and programmes on the environment (SEA Directive) 2001/42/EC*	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
This Directive ensures that individual Parties integrate environmental assessment into their plans and programmes at the earliest stages, whereby an SEA becomes mandatory for plans / programmes which are: • Prepared for agriculture, forestry, fisheries, energy, industry transport, waster / water management, telecommunications, tourism, town & country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive; Or • Have been determined to require an assessment under the Habitats Directive. For any plans / programmes not included in the above, the Member States must carry out a screening procedure to determine whether the plans / programmes are likely to have significant environmental effects.	This directive provides the regulatory basis for an SEA being carried out as part of the WRMP.
European Commission (2002) *Directive on the Energy Performance of Buildings (2002/91/EC)*	
The European Union Energy Performance of Buildings Directive was published in the Official Journal on the 4th January 2003. The overall objective of the Directive is to promote the improvement of energy performance of buildings within the Community taking into account outdoor climate and local conditions as well as indoor climate requirements and cost effectiveness. The Directive highlights how the residential and tertiary sectors, the majority of which are based in buildings, accounts for 40% of EU energy consumption.	The SEA should highlight any opportunities for new buildings associated with the Cambridge Water WRMP to contribute to improved energy performance.
European Commission (2002) *The Environment Noise Directive (END) (2002/49/EC)*	
The END aims to "define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to the exposure to environmental noise". For that purpose several actions are to be progressively implemented. It furthermore aims at providing a basis the harmful effects, including annoyance, due to the exposure to environmental noise". For that purpose several actions are to be progressively implemented. It furthermore aims at providing a basis for developing EU measures to reduce noise emitted by major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery. The underlying principles of the Directive are similar to those underpinning other overarching environment policies (such as air or waste).	The WRMP will need to have regard to the requirements of the END. The SEA assessment framework should include for the protection against excessive noise
European Commission (2004) *Environmental Liability Directive (2004/35/EC)*	
The Directive establishes a framework for environmental liability based on the "polluter pays" principle, with a view to preventing and remedying environmental damage.	The SEA should take account of the need to ensure that proposals in the WRMP avoid causing direct or indirect damage to the aquatic environment or contamination of land that creates a significant risk to human health.
European Commission (2005) *Thematic Strategy on Air Pollution*	
This strategy supplements legislation. It sets out objectives for air pollution and proposes measures for achieving them by 2020.	The WRMP should be in accordance with the requirements of the strategy. The SEA should take into account the need to improve air quality

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
European Commission (2006) *Thematic Strategy for Soil Protection*	
The Thematic Strategy for Soil Protection consists of a Communication from the Commission to the other European Institutions, a proposal for a framework Directive (a European law), and an Impact Assessment.	The SEA assessment framework should include soils.
European Commission (2006) *Fresh Water Fish Directive (2006/44/EC)*	
The Directive seeks to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. For those waters, it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters. The Directive is designed to protect and improve the quality of rivers and lakes to encourage healthy fish populations.	The SEA should seek to promote the protection of river and lake water quality in order to maintain and develop suitable environments that will sustain water fish populations.
European Commission (2006) *Directive on Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC)*	
The Directive establishes: • Animal health requirements for the placing on the market, importation and transit of aquaculture animals and their products; • Minimum measures to prevent diseases in aquaculture animals; • Minimum measures to be taken in response to suspected or established cases of certain diseases in aquatic animals	The SEA should take account of the need to maintain or enhance the quality of habitats and biodiversity.
European Commission (2006) *Directive on the protection of groundwater against pollution and deterioration (2006/118/EC)*	
This Directive establishes specific measures as provided for in Article 17(1) and (2) of Directive 2000/60/EC (Water Framework Directive) in order to prevent and control groundwater pollution. This Directive is designed to prevent and combat groundwater pollution.	The SEA should take account of the need to maintain, protect and improve water quality across the WRMP area.
European Commission (2007) *The Eel Directive (2007/1100/EC)*	
The Eel Directive establishes measures for the recovery of the stock of European eel and requires member states to produce Eel management plans for each catchment.	The WRMP should ensure that there are no adverse impacts on eel as a result of water resource management measures.
European Commission (2007) *Floods Directive (2007/60/EC)*	
The Directive's aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive shall be carried out in coordination with the Water Framework Directive, notably by flood risk management plans and river basin management plans being coordinated, and through coordination of the public participation procedures in the preparation of these plans.	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP. The SEA assessment framework should include flood risk.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
European commission (2008) *Directive on Waste (Directive 75/442/EEC, 2006/12/EC 2008/98/EC as amended)*	
The essential objective of all provisions relating to waste management should be the protection of human health and the environment against harmful effects caused by the collection, transport, treatment, storage and tipping of waste. Some key objectives include: • The recovery of waste and the use of recovered materials as raw materials should be encouraged; • Member States should, in addition to taking responsible action to ensure the disposal and recovery of waste, take measures to restrict the production of waste; • Movements of waste should be reduced; • Ensure a high level of protection and effective control; • That proportion of the costs not covered by the proceeds of treating the waste must be defrayed in accordance with the 'polluter pays' principle.	The WRMP should seek to ensure the protection of human health and the environment in relation to waste management. The SEA assessment should include objectives on the protection of human health and the environment.
European Commission (2008) *Ambient Air Quality Directive (2008/50/EC)*	
The Directive sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health such as particulate matter (PM10 and PM2.5) and nitrogen dioxide (NO2). There are also indirect effects as these pollutants can combine in the atmosphere and contribute to greenhouse gases which can be transported great distances by weather systems.	The implementation of the WRMP may have some influence on air quality, either directly or indirectly, through construction or operational activities. The SEA should take account of the need to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum. Seek to help meet regional air quality targets.
European Commission (2009), *Birds Directive (2009/147/EC)*	
The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It sets broad objectives for a wide range of activities, although the precise legal mechanisms for their achievement are at the discretion of each Member State (in the UK delivery is via several different statutes).	The SEA should seek to protect and conserve important bird habitats.
European Commission (2009), *Promotion of the use of energy from renewable sources Directive (2009/28/EC)*	
This promotes the use of energy from renewable sources.	The SEA should take account of the need to seek to promote the use of renewable energy.
European Commission (2012) A Blueprint to safeguard Europe's Water Resources	
This document outlines actions that concentrate on better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular with regard to water quantity and efficiency. This has a long-term aim to ensure sufficient availability of good quality water for sustainable and equitable use.	The implementation of the WRMP should seek to facilitate the ongoing reliable availability of good quality water.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
European Commission (2020), *The EU Biodiversity Strategy for 2030*	
The strategy aims to halt the loss of biodiversity and ecosystem services in the EU and help stop global biodiversity loss by 2020. It reflects the commitments taken by the EU in 2010, within the international Convention on Biological Diversity.	The implementation of the WRMP may influence biodiversity in the Cambridge Water area and as such the SEA should take account of the need to maintain or enhance the quality of habitats and biodiversity.
European Commission (2020) The 8th Environment Action Programme to 2030	
Building on the European Green Deal, the programme has the following six priority objectives: • achieving the 2030 greenhouse gas emission reduction target and climate neutrality by 2050 • enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change • advancing towards a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy • pursuing a zero-pollution ambition, including for air, water and soil and protecting the health and well-being of Europeans • protecting, preserving and restoring biodiversity, and enhancing natural capital (notably air, water, soil, and forest, freshwater, wetland and marine ecosystems) • reducing environmental and climate pressures related to production and consumption (particularly in the areas of energy, industrial development, buildings and infrastructure, mobility and the food system)	The implementation of the WRMP may impact the objectives set out in the Action Programme.
ICOMOS (2011) *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*	
This document provides guidance on the process of Commissioning Heritage Impact Assessments (HIAs) for World Heritage properties in order to evaluate the impact of potential development on the Outstanding Universal Value (OUV) of properties. The guidance is addressed at managers, developers, consultants and decision-makers and is also intended to be relevant to the World Heritage Committee and States Parties. The concept of OUV underpins the whole World Heritage Convention and all activities associated with properties inscribed on the List.	The SEA Framework should include an objective on the conservation and enhancement of heritage.
IUCN (2013) World Heritage Advice Note: Environmental Assessment	
This Advice Note provides States Parties and other stakeholders with guidance on how to identify, evaluate, avoid and mitigate potential impacts of development proposals on World Heritage values, before decisions are taken. It provides guidance on integrating natural World Heritage Sites within Environmental Assessments. It includes a set of World Heritage Impact Assessment Principles that can be applied to all types of environmental Assessments, a list of key questions to ask concerning World Heritage during the assessment as well as step-by-step guidance.	The WRMP should seek to contribute towards the protection of World Heritage Sites. The SEA assessment framework should include objectives and guide questions relating to the conservation of World Heritage Sites. The SEA assessment should also reflect/incorporate the principles of the guidance, where relevant.
The Bonn Convention (or CMS) (1983) *The Convention on the Conservation of Migratory Species of Wild Animals*	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Aims to conserve terrestrial, marine and avian migratory species by protecting endangered, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger such species. Enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).	The impacts of the WRMP options on important Bird habitats (i.e. Ramsar sites and SPA designated sites) must be considered as part of the SEA.
The Paris Agreement (2016), Cancun Agreement (2011) and Kyoto Agreement (1997)	
These agreements represent key steps forward in capturing plans to reduce greenhouse gas emissions and to help developing nations protect themselves from climate impacts and build their own sustainable futures. It includes a shared vision to control the global rise in temperature.	The SEA should consider the need for water companies to seek to promote a reduction in greenhouse gas emissions in carrying out its service activities.
UNESCO (2017) *Ramsar Convention on Wetlands of International Importance*	
The Convention on Wetlands (Ramsar, Iran, 1971) (the "Ramsar Convention") is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories. Ramsar sites within Cambridge Water's SEA Assessment area include the Severn Estuary and the Somerset Levels.	The impacts of the WRMP options on important wetland habitats must be considered as part of the SEA.
UNESCO (1972) The World Heritage Convention – a global instrument for the protection of cultural and natural heritage.	
A global instrument for the protection of cultural and natural heritage. Signatories commit themselves to refraining from 'any deliberate measures which might damage, directly or indirectly, the cultural and natural heritage' of their World Heritage Sites. The city of Bath is the closest UNESCO designated site.	The WRMP and SEA should take account of the need to protect World Heritage Sites.
UNESCO (2001) *Convention on the Protection of Underwater Cultural Heritage*	
The Convention sets a common standard for the protection of submerged cultural heritage, with a view to preventing its being looted or destroyed. The Convention sets out basic principles for the protection of underwater cultural heritage; provides a detailed State cooperation system; and provides widely recognised practical rules for the treatment and research of underwater cultural heritage. This includes obligations to preserve such heritage, a preference for in situ preservation, and no commercial exploitation.	The WRMP should seek to protect cultural heritage sites. The SEA assessment framework should include an objective relating to cultural heritage.
United Nations (1992), *Convention on Biological Diversity (CBD)*	
The main objectives are: • Conservation of biological diversity • Sustainable use of its components • Fair and equitable sharing of benefits arising from genetic resources	The commitment to conserving biological diversity must be considered in any WRMP options and the SEA should seek to promote the protection and enhancement of biodiversity.
United Nations Economic Commission for Europe (1998) *Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters*	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
The Aarhus Convention grants the public rights regarding access to information, public participation and access to justice, in governmental decision-making processes on matters concerning the local, national and transboundary environment. It focuses on interactions between the public and public authorities. The Aarhus Convention has been ratified by the European Community, which has begun applying Aarhus-type principles in its legislation, notably the Water Framework Directive (Directive 2000/60/EC).	The Convention is designed to improve the way ordinary people engage with government and decision-makers on environmental matters. It helps to ensure that environmental information is easy to get hold of and easy to understand. The SEA should seek to provide easily understood information to the public on the environmental implications of the WRMP and its constituent options.
United Nations (2002), Commitments arising from the World Summit on Sustainable Development, Johannesburg	
The World Summit on Sustainable Development proposed broad-scale principles which should underpin sustainable development and growth. It included objectives such as: • Greater resource efficiency • Work on waste and producer responsibility • New technology development • Push on energy efficiency • Integrated water management plans needed Minimise significant adverse effects on human health and the environment from chemicals by 2020.	These commitments are the highest level definitions of sustainable development. The WRMP should be influenced strongly by all of these themes and should seek to take its aims into account. The SEA should seek to promote the achievement of the sustainable development objectives outlined in this plan.
National	
Canal & River Trust (2015) Living Waterways Transform Places & Enrich Lives: Our 10 Year Strategy	
The strategy sets out goals for the organisation for the next ten years. These are themed under: • Waterways, including: 'To encourage and grow the number of people boating, using and enjoying the waterways' and 'To look after the heritage and wildlife on our canals and rivers for people to enjoy now and in the future'; • Place, including: 'To provide havens for people to escape to away from the pressures of modern life' and 'Enhance wildlife habitats and the natural landscape'; • Prosperity, including: 'Our waterways to drive and be a catalyst for regeneration and developments that make a difference to the local area' and 'To contribute to local economies and to provide opportunities and livelihoods for local people'; and	The WRMP should avoid causing detrimental effects on canals and rivers. The SEA assessment framework should include objectives which take into account the goals of the strategy and the protection of rivers and canals.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
• People, including: 'Communities to feel ownership of, and get involved with caring for, their local waterway' and 'To offer something for everyone to enjoy'. These are in addition to goals relating to Influence and Resources.	
Canal and River Trust (2015) Water Resources Strategy 2015 – 2020	
The Strategy sets out the Canal and River Trust's overarching vision and work plan for the next five years for how it intends to manage water resources across the inland waterway network that it manages. The strategy is focused on delivering long-term security of water supply for the Canal & River Trust to achieve its vision of living waterways that transform places and enrich lives.	The WRMP should take into consideration the potential impact on the supply of water to the inland waterway network within the Cambridge Water area and individual water company supply areas. The SEA should consider the effects of the draft Drought Plan on the long-term supply of water to the canal network.
The Climate Change Act 2008 & The Climate Change Act 2008 (2050 Target Amendment) Order 26 June 2019	
This act sets carbon targets for 2050. Originally the target was for net carbon account for 2050 at least 80% lower than 1990 baseline, however, this was revised in 2019 to be at least 100% lower in line with the net zero ambition. The 2019 amendment changed the UK carbon emissions reduction target from an 80% to a 100% reduction.	This target needs to be taken into account by the SEA. The new target from 2019 needs to be taken into account by the SEA objective for energy use and greenhouse gas emissions, and adaptation to climate change.
Conservation of Habitats and Species Regulations (as amended) 2017	
These regulations consolidate all the various amendments made to the Conservation (Natural Habitats) Regulations 1994 in England. The regulations provide for the designation and protection of 'European sites', the protection of 'European species', and the adaptation of planning and other controls for the protection of European Sites. They are the principal means by which the Habitats Directive is transposed in England as such its main objective is to promote the maintenance of biodiversity.	The WRMP must fully comply with the Regulations. The impacts of the WRMP options on biodiversity and protected species and sites must be considered as part of the SEA.
The Countryside and Rights of Way (CROW) Act, 2000	
The Act provides for increased public access to the countryside and strengthens protection for wildlife. The main provisions of the Act are as follows: • Extends the public's ability to enjoy the countryside whilst also providing safeguards for landowners and occupiers • Creates new statutory right of access to open country and registered common Land Use Consultants • Modernises Right of Way system • Gives greater protection to SSSIs • Provides better management arrangements for AONBs Strengthens wildlife enforcement legislation.	The SEA should include objectives that take into account public access, protection of SSSIs and the management of relevant landscape designations.

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Defra (2004) Rural Strategy	
The strategy sets out rural and countryside policy and draws upon from lessons learnt following the rural white paper. Objectives include supporting economic and social regeneration across rural England and enhance the value of the countryside and protect the natural environment for this and future generations.	The implementation of certain WRMP options may have an effect upon rural communities and the countryside. The SEA should also seek to ensure that the quality of the region's landscapes, natural resources and biodiversity are maintained or enhanced.
Defra (2004) The First Soil Action Plan for England	
This plan is a comprehensive statement on the state of the UK's soils and how Government and other partners were working together to improve them. It aims to ensure that England's soils will be protected and managed to optimise the varied functions that soils perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development.	The SEA should seek to ensure that the quality of the region's land, including soils, is protected or enhanced.
Defra (2005) Securing the Future: Delivering UK Sustainable Development Strategy	
The strategy for sustainable development aims to enable all people to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations. The strategy places a focus on protecting natural resources and enhancing the environment.	The SEA must seek to ensure that objectives relating to sustainable development, sustainable resource use and protecting the natural environment, are considered when assessing the potential impacts of the WRMP.
Defra (2005) Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England	
The strategy outlines how to manage the risks from flooding and coastal erosion in the UK. The strategy aims to reduce the threat of flooding to people and their property, and to deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles.	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP.
Defra (2007) The Air Quality Strategy for England, Scotland and Wales	
This strategy identifies air quality objectives and policy options to further improve air quality in the UK from into the long term. The options are intended to provide important benefits to quality of life and help protect the environment as well as the direct benefits to public health.	The implementation of the WRMP may have some influence on air quality, either directly or indirectly through construction or operation activities. The SEA should seek to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum.
Defra (2007), Conserving Biodiversity in a Changing Climate: Guidance on Building Capacity to Adapt	
The guiding principles described in this document summarise current thinking on how to reduce the impacts of climate change on biodiversity and how to adapt existing plans and projects in the light of climate change. The	The SEA must consider the impacts on biodiversity whilst also taking into account the potential for future climate change.

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guidance is intended to inform implementation of the UK Biodiversity Action Plan, taking account of climate change is relevant to the fulfilment of many international agreements and obligations affecting the UK.	
Defra (2008) England Biodiversity Strategy –climate change adaptation principles	
Government strategy presenting five principles that are fundamental to conserving biodiversity during climate change. The precautionary principle underlies all the principles.	The SEA must consider the impacts on biodiversity whilst also taking into account the potential for future climate change.
Defra (2009) Safeguarding our soils – A Strategy for England	
The new Soil Strategy for England – Safeguarding our Soils – outlines the Government's approach to safeguarding our soils for the long term. It provides a clear vision to guide future policy development across a range of areas and sets out the practical steps that we need to take to prevent further degradation of our soils, enhance, restore and ensure their resilience, and improve our understanding of the threats to soil and best practice in responding to them. The Governments vision is that: By 2030, all England's soils will be managed sustainably, and degradation threats tackled successfully. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.	The SEA should seek to ensure that the quality of the regions soils and their management is protected or enhanced.
Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network	
This independent review of England's wildlife sites and the connections between them sets objectives and recommendations to help achieve a healthy natural environment that will allow our plants and animals to thrive.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper	
Addresses the Government's approach to valuing economic and social benefits of a healthy natural environment while continuing to recognise nature's intrinsic value. It describes the vision of the Government for this to be the first generation to leave the natural environment of England in a better state than it inherited, requiring placing the value of nature at the heart of decision-making – in Government, local communities and businesses. Approaches to mainstream the value of nature across society include: • facilitating greater local action to protect and improve nature; • creating a green economy, in which economic growth and the health of our natural resources sustain each other, and markets, business and Government better reflect the value of nature; • strengthening the connections between people and nature to the benefit of both; and showing leadership in the European Union and internationally, to protect and enhance natural assets globally	The WRMP supports the provisioning service of freshwater through ensuring security of supply. The media campaigns that form part of the demand side WRMP options may contribute towards increasing the awareness of the population to the value the provisioning services of water. Other related ecosystem services may include: • Provisioning Services: Biodiversity • Regulating Services: Water Regulation • Cultural services: Recreation and ecotourism • Cultural services: Cultural heritage values • Cultural services: Aesthetic The SEA should ensure the WRMP effects the related provisioning services in the least damaging way through

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	informing the WRMP formulation and selection of WRMP options during times of Drought.
Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services	
The objective for the next decade is: 'to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.' Four action areas are: • A more integrated large-scale approach to conservation on land and at sea • Putting people at the heart of biodiversity policy • Reducing environmental pressures • Improving our knowledge.	The SEA must consider impacts on biodiversity. The implementation of the WRMP may influence biodiversity in the area and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity and take regards of priority species.
Defra (2011) Water for Life – Water White Paper	
This sets out market reform in the water sector.	The WRMP should take into account the contents of this paper.
Defra (2011) Government Review of Waste Policy in England 2011	
The review is guided by the "waste hierarchy", EU obligations and targets on waste management, carbon impacts, environmental objectives and the costs and benefits of different policy options. The Governments vision include a move beyond the current throwaway society to a "zero waste economy" in which material resources are re-used, recycled or recovered wherever possible, and only disposed of as the option of very last resort.	The WRMP may involve options that involve the generation of waste (e.g. either through construction requirements or operation of supply side options). The SEA should seek to enhance recycling and minimise the amount of waste going to landfill.
Defra (2011) Future Water: The Government's water strategy for England	
This strategy is the high level Government document which outlines how the Government wants the water sector to look by 2030, considering issues of water demand, water supply, water quality in the natural environment, surface water drainage, river and coastal flooding, greenhouse gas emissions and charging. It states that "by 2030 at the latest, we have: Improved the quality of our water environment and the ecology which it supports, and continued to provide high levels of drinking water quality from our taps Sustainably managed risks from flooding and coastal erosion, with greater understanding and more effective management of surface water Ensured a sustainable use of water resources, and implemented fair, affordable and cost-reflective charges.	The SEA should seek to ensure that the themes included in the strategy objectives are also reflected in the SEA objectives, particularly around water quality in the region, the quality of aquatic ecology, drinking water quality, resource use, energy use and greenhouse gas emissions, and adaptation to climate change.
Defra (2012) The UK Evidence Report	

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Five themes are identified that form the priorities for adaptation in the UK.	The SEA should take into account the need for climate change adaptation.
Defra (2012) National Policy Statement for Waste Water	
National Policy Statement (NPS) sets out Government policy for the provision of major waste water infrastructure. It will be used by the Infrastructure Planning Commission (IPC) to guide its decision making on development consent applications for waste water developments that fall within the definition of Nationally Significant Infrastructure Project (NSIP) as defined in the Planning Act 2008.	The SEA should seek to ensure the WRMP considers any unforeseen NSIP proposals that come forward prior to adoption which may affect water resources in the Cambridge Water area.
Defra (2011) UK National Ecosystem Assessment Defra (2014) UK National Ecosystems Assessment Follow on, Synthesis of Key Findings	
Ecosystems services from natural capital contribute to the economic performance of the nation. Information and tools to enable decision makers to understand the wider value of ecosystems and their associated services.	For the purposes of the readership integrating an ecosystems services approach into the SEA is not being undertaken. However, it is realised that through the 'Objective-led' approach, many of the services relevant to the WRMP can be considered through the objectives and key questions for example: • Provisioning Services: Freshwater • Provisioning Services: Biodiversity • Regulating Services: Water Regulation • Cultural services: Recreation and ecotourism • Cultural services: Cultural heritage values • Cultural services: Aesthetic The SEA should ensure the WRMP effects the related provisioning services in the least damaging way through informing the WRMP formulation and selection of options. In the event of further guidance being issued on incorporating ESA into SEA, the anticipated approach is sufficiently flexible that it should be able to accommodate this (subject to timing).
Defra (2015) The Great Britain Invasive Non-native Species Strategy	
The Strategy is intended to provide a strategic framework, updated from the 2008 framework, within which the actions of government departments, their related bodies and key stakeholders can be better co-ordinated. Its	The implementation of the WRMP may influence biodiversity in the south east and as such the SEA should

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overall aim is to minimise the risks posed, and reduce the negative impacts caused, by invasive non-native species in Great Britain.	seek to maintain or enhance the quality of habitats and biodiversity.
Defra (2019) Clean Air Strategy 2019	
The Clean Air Strategy provides a way in which the UK will tackle all sources of air pollution with the main aims of making UK air healthier to breathe, protecting nature and boosting the economy.	The WRMP should consider the impact it may have on air quality.
Defra (2020) Enabling a Natural Capital Approach (ENCA)	
ENCA resources are a mixture of data, guidance and tools that enable individuals/ organisations to understand natural capital and know how to take it into account. The aims of ENCA are to: • Build capacity among users to assess and value the natural environment by providing comprehensive information and resources • Reduce search costs for analysts and decision makers • Provide a platform to update tools and guidance as knowledge develops • Identify new evidence and areas for development The guidance is a comprehensive document providing information and resources for Natural Capital, covering the natural capital framework, economic valuation of the environment, how project or policy appraisal can incorporate natural capital, natural capital accounting principles and methods, benefits and challenges and applying natural capital at a local level.	The SEA will help to inform future development by Cambridge Water and therefore should consider the effect of the WRMP options on opportunities for natural capital.
Defra (2020) Water abstraction plan and supplementary documents: Water abstraction plan: Environment; Water abstraction plan: Catchment focus; and, Water abstraction plan: Abstraction licensing service	
This document sets out how the government will reform water abstraction management over the coming years and how this will protect the environment and improve access to water. The plan states that the current approach to managing abstraction has three main issues: • some older licences allow abstraction that can damage the environment; • the current approach is not flexible enough to cope with the pressures of increasing demand for water and climate change in the long term, or to allow abstractors access to additional water when it is available; and, • the abstraction service is outdated and paper-based. The plan explains how approaches identified to address these issues will be implemented. The Government's approach to addressing these issues has three main elements: • making full use of existing regulatory powers and approaches to address unsustainable abstraction and move around 90% of surface water bodies and 77% of groundwater bodies to the required standards by 2021	The WRMP should consider how they can help to address the issues set out in the plan. The SEA should consider the effects of the WRMP on the environment, climate change and the sustainability of options.

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• developing a stronger catchment focus – bringing together the Environment Agency, abstractors and catchment groups to develop local solutions to existing pressures and to prepare for the future. These local solutions will:
  ○ protect the environment by changing licences to better reflect water availability in catchments and reduce the impact of abstraction
  ○ improve access to water by introducing more flexible conditions that support water storage, water trading and efficient use
• supporting these reforms by modernising the abstraction service, making sure all significant abstraction is regulated and bringing regulations in line with other environmental permitting regimes
The supplementary *Environment* provides further information on the work to address unsustainable abstraction set out in the abstraction plan. The supplementary *Catchment Focus* document provides further information on proposals set out in the abstraction plan to develop a stronger catchment focus. This is about bringing together the Environment Agency, abstractors and catchment partnerships to identify and implement local solutions to existing pressures and to prepare for the future. The supplementary *Abstraction Licencing Service* document provides further information on the planned reforms to the abstraction licensing service set out in the abstraction plan.	

Defra (2021) Waste Management Plan for England 2021	
The Waste Management Plan for England is an analysis of the current waste management situation in England. The plan does not introduce new policies or change how waste is managed in England. Its aim is to bring current waste management policies together under one national plan.	The WRMP may involve options that involve the generation of waste (e.g. either through construction requirements or operation of supply side options). The SEA should seek to enhance recycling and minimise the amount of waste going to landfill.
Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living	
Sets out a number of objectives linked to creating a great place for living. The objectives are related to the following topics: • Environment – a cleaner, healthier environment, benefiting people and the economy; • Food and farming – a world-leading food and farming industry; • Rural – a thriving rural economy, contributing to national prosperity and wellbeing; • Protection – a nation better protected against floods, animal and plant diseases and other hazards, with strong response and recovery capabilities; • Excellent Delivery – Excellent delivery, on time and to budget with outstanding value for money; An outstanding organisation – an organisation striving to be the best, focused on outcomes and constantly challenging itself.	The SEA must take into account impacts of the WRMP options (construction and operation) on the environment, as well as the population and human health and land use (which will impact on the food and farming and rural objectives).

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Defra and Welsh Government (2014) River Basin Planning Guidance	
Aims to give guidance on practical implementation of the Water Framework Directive (WFD). The river basin planning process involves setting environmental objectives for all groundwater and surface waters (including estuaries and coastal waters) within the river basin district and devising programmes of measures to meet those objectives.	The WRMP should take into account the contents of this statutory guidance.
Department of Energy and Climate Change (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity	
This white paper outlines a package of reforms so that by 2030 there will be a flexible, smart and responsive electricity system, powered by a range of low carbon sources of electricity. This includes engaging with consumers on energy use. Decarbonisation is important in meeting the 2050 targets.	The implementation of the WRMP may have an influence upon Cambridge Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
Department of Energy and Climate Change (2011) National Policy Statements for Energy Infrastructure	
The energy National Policy Statements (NPSs) set out national policy against which proposals for major energy projects will be assessed and decided on by the Infrastructure Planning Commission. The purpose of the NPSs is to develop a clear, long-term policy framework which facilitates investment in the necessary new infrastructure (by the private sector) and in energy efficiency. It highlights that the construction, operation and decommissioning of infrastructure can lead to increased demand for water, involve discharges to water and cause adverse ecological effects resulting from physical modifications to the water environment.	The SEA should consider the cumulative effects of the WRMP and any major energy proposals which may affect the availability of water in the Cambridge Water supply area.
Department for Culture, Media and Sport (2001) *The Historic Environment – A Force for the Future*	
This strategy outlines the Government's policy regarding the historic environment. The strategy has key aims and objectives that demonstrate the contribution the historic environment makes to the country's economic and social well-being.	The implementation of the WRMP may have an influence on the heritage of the region, in particular if options affect surface water levels. The SEA should seek to ensure any adverse effects on heritage assets are minimised or avoided.
Department for Culture, Media and Sport (2013) *Scheduled Monuments & Nationally Important but Non-Scheduled Monuments*	
This policy statement sets out Government policy on the identification, protection, conservation and investigation of nationally important ancient monuments, under the provisions of the Ancient Monuments and Archaeological Areas Act 1979. It includes principles relating to the selection of scheduled monuments and the determination of applications for scheduled monument consent.	The WRMP should seek to avoid adverse impacts on scheduled and non-scheduled monuments. The SEA assessment framework should include specific objectives relating to cultural heritage
Department for Culture, Media and Sport (2016) *The Culture White Paper*	

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This white paper sets out how the government will support the cultural sectors over the coming years and how culture will play an active role in building a fairer and more prosperous nation. It includes four key themes: • everyone should enjoy the opportunities culture offers, no matter where they start in life; • the riches of our culture should benefit communities across the country; and • the power of culture can increase our international standing. The white paper includes objectives relating to the development of the historic environment sector, and the protection of world heritage.	The WRMP should seek to protect cultural heritage assets. The SEA assessment framework should include an objective relating to cultural heritage.
The Eels Regulations 2009	
Implement European Council Regulations 1100/2007 establishing measures for the recovery of the stock of European eel. The Regulations will help implement delivery Eel Management Plans. They address eel records and re-stocking, close season and reduction of fishing effort, passage of eels and entrainment. The key objective is to ensure that at least 40% of the potential production of silver eels returns to the sea to spawn. This will be achieved by reducing exploitation of all life-stages of the eel and restoration of their habitats.	The SEA should seek to maintain the quality of habitats and biodiversity and take regard of protected species identified. This should include migratory fish species and their migratory passage.
The Energy Act 2013	
This provides the legislative framework for delivering secure, affordable and low carbon energy. It includes provision for decarbonisation.	The implementation of the WRMP may have an influence upon the Cambridge Water area's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
The Environment Act 2021	
The Environment Act set up the EA to manage resources and protect the environment in England and Wales Priority areas are air quality, water, biodiversity and resource efficiency and waste reduction.	The SEA should seek to promote the protection and enhancement of all water resources without having negative effects on other aspects of the environment.
Environmental Protection Act 1990	
The Environmental Protection Act 1990 makes provision for the improved control of pollution to the air, water and land by regulating the management of waste and the control of emissions	The WRMP should take into consideration the impact it may have on air, water and land pollution
The Environmental Assessment of Plans and Programmes Regulations 2004 (the SEA Regulations)	
This represents the transposition of the Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive).	This regulation provides the UK regulatory basis for an SEA being carried out as part of the WRMP.
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015	

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These regulations amend the 2009 regulations and provide additional protection to habitats and species identified on Annexes 1 and 2 of the EC Habitats Directive (92/43/EEC), SSSIs and, in some cases, classified waterbodies from environmental damage where an operator has intended to cause damage or been negligent to the potential for damage. Applies to the most serious categories of environmental damage, including; Contamination of land that results in a significant risk of adverse effects on human health. Adverse effects on surface water or groundwater consistent with a deterioration in the water's status. Adverse effects on the integrity of an SSSI or on the conservation status of species and habitats protected by EU legislation outside SSSIs.	The SEA should seek to ensure that the guidance is considered when assessing the WRMP.
Environment Agency (2007) Soil: A Precious Resource	
The soil strategy identifies the Environment Agency's priorities, sets out their role and says what action is to be taken to protect, manage and restore soil. Damaged soil structure can lead to flooding, water pollution and can affect the landscape and archaeological features. The strategy also outlines the part managing soils can play in mitigating climate change.	The WRMP should ensure the sustainable management of soil resources. SEA objectives should reflect and consider relevant priorities from the Soil: A Precious Resource publication.
Environment Agency (2009), Water Resources Strategy for England and Wales	
Launched on 30 March 2009, covering the actions that the Environment Agency believes need to be taken to ensure that there is enough water for people and wildlife in the face of future pressures. These include: • climate change • population growth • diffuse pollution • water for wildlife and wetlands	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives, particularly around water resource use and availability in the region.
Environment Agency (2010), Water Resources Action Plan for England and Wales	
The strategy has four main aims: • Adaptation to and mitigation of climate change; • A better water environment; • Sustainable planning and management of water resources; • People valuing water and the water environment.	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives particularly regarding the sustainable management of water resources and protecting the environment.
Environment Agency (2013), Managing Water Abstraction	
This sets out how the EA manages water resources in England.	The SEA should consider the range of impacts that changes to abstractions could have on the environment, including water bodies, biodiversity, and water users.

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Environment Agency (2017) Drought response: our framework for England	
This framework describes how drought affects England and how the EA works closely with the government, water companies and others to manage the effects of drought on people, business and the environment. Specifically, the framework sets out: • How drought affects different parts of England • Who is involved in managing drought and how they work together • How the agency and others take action to manage drought • How we monitor and measure the impacts of drought to advise senior management and government on the prospects and possible action How we report on drought and communicate with others	The supply of water resources in the region may be affected by future drought, therefore this framework is linked closely with the WRMP. The WRMP and SEA need to take account of the guidance provided by the Environment Agency.
Environment Agency (2020) National Flood and Coastal Erosion Risk Management Strategy for England	
This strategy's long-term vision is for: a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100. It has 3 long-term ambitions, underpinned by evidence about future risk and investment needs. They are: • climate resilient places: working with partners to bolster resilience to flooding and coastal change across the nation, both now and in the face of climate change • today's growth and infrastructure resilient in tomorrow's climate: making the right investment and planning decisions to secure sustainable growth and environmental improvements, as well as infrastructure resilient to flooding and coastal change • a nation ready to respond and adapt to flooding and coastal change: ensuring local people understand their risk to flooding and coastal change, and know their responsibilities and how to take action	The SEA should consider how the WRMP may affect flood and coastal risk across the region.
Environment Agency (2020) Meeting our future water needs: a national framework for water resources	
The organisations responsible for England's water supplies have understood the long term needs of sectors that depend on a secure supply of water – public water supply, agriculture, power generation, industry and the environment. These needs will be met through the development of regional water resources plans. Agreed what the regional plans should deliver and how, so they drive a step-change in water resources planning. The national framework identifies strategic water needs for England and its regions across all sectors up to and beyond 2050. Sets out a strategic direction for the work being carried out by regional water resources groups by exploring the range of approaches available to meet the likely pressures	The WRMP should consider the water resource framework and what it states should be included in a plan.
Environment Agency (2020) Water Company Drought Plan guideline	
This guidance, written in conjunction with Defra, outlines the legislative requirements for a drought plan. This document also provides a timeline for the drought planning process.	The WRMP and the SEA should consider the guideline, where relevant.

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Environment Agency (undated) Restoring Sustainable Abstraction Programme	
EA note that there is evidence to suggest that unsustainable abstraction of groundwater and surface water could be contributing to environmental damage of rivers and wetlands in England and Wales, including sites of national and international conservation importance. In May 1997, at the Government's Water Summit, a commitment was made to reverse the damage caused by past decisions. EA investigates where over-abstraction has occurred and work with local people to restore sustainable supplies.	The WRMP will need to consider the implications of changes to abstraction strategies. The SEA should include a guide question relating to water resources.
Environment Agency (various dates) Abstraction Licensing Strategies	
Sets out how much water is available for abstraction within each key river catchment, taking into account the needs of the environment and existing abstractors.	The WRMP should consider relevant catchment strategies and any environmental protection measures of relevance to the WRMP options.
Environment Agency (undated) Hydroecology: Integration for modern regulation	
This paper describes clear way forward in terms of hydroecology and a strategic direction to its development and application.	The WRMP and SEA should ensure relevant ecological considerations are integral to water resource evaluation and management decisions across the range of temporal and spatial scales.
Environment Agency (undated), WFD River Basin Characterisation Project: Technical Assessment Method - River abstraction and flow regulation	
This paper describes the method used to assess the likelihood of river water bodies achieving the relevant WFD objectives as a result of artificial influences on low river flows.	Implementation of the WRMP may impact river water quality. The SEA should seek to promote the protection and enhancement of biodiversity and river water quality across the region.
Environment Agency, OfWAT and Natural Resources Wales (2020) Water Resources Planning Guideline Draft for consultation – July 2020, and Technical Supplementary Guidance	
The draft water resources planning guideline provides an update to the framework for water companies to follow in developing and presenting their water resources plans. It sets out good practice behind the composition of a plan, the approaches to developing a plan and the information that a plan should contain.	These guidelines, once adopted, will replace the previous guidelines and will be used by water companies to develop their WRMP, the WRMPs should therefore be developed in line with the guideline. An appreciation of the processes used to develop the WRMP will benefit the SEA. The SEA should seek to ensure that water supplies and resources are maintained or enhanced in line with the Water Resources Planning Guidelines.
Flood and Water Management Act (2010) as amended	

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The Flood and Water Management Act 2010 aims to provide better, more comprehensive management of flood risk for people, homes and businesses. It aims improve efficiency in the water industry, improve the affordability of water bills for certain groups and individuals, and help ensure continuity of water supplies to the consumer.	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP and that water supplies across the region are maintained.
Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment	
Guidance for addressing the historic environment in Strategic Environmental Assessment or river bas. It identifies the recommended list of plans, programmes and policies for review, approach to baseline review, potential sustainability issues.	The SEA should consider the potential effects of the WRMP on the historic environment, particularly designated assets and their settings, and to important wetland areas with potential for palaeo-environmental deposits. Historic characterisation can supplement information about designations. Sustainability issues, objectives and indicators identified in this document should be taken into account in the SEA.
Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3	
This provides guidance on managing change within settings of heritage assets. This includes archaeological remains, historic buildings, sites, areas and landscapes.	The SEA should take into account effects on settings of heritage assets.
Historic England (2016) Climate Change and the Historic Environment	
Sets out the current thinking on the implications of climate change for the historic environment. It is intended both for the heritage sector and also for those involved in the wider scientific and technical aspects of climate change; in the development of strategies and plans relating to the impact of climate change; or in projects relating to risk assessment, adaptation and mitigation.	The SEA should seek to assess the implications of the WRMP in combination with climate change and the potential impacts on heritage and the historic environment.
Historic England (2021) Heritage at Risk	
Heritage at risk is a national programme that aims to identify the endangered sites (historic buildings and places with increased risks of neglect and decay) and then help secure them for the future. Regional Heritage at Risk Registers were most recently published in 2019.	The SEA should seek to protect and enhance and landscape.
The Historic Environment Group (2018) Historic Environment and Climate Change Sector Adaption Plan	
The sector adaptation plan (SAP) is a high-level, strategic document intended to identify climate change risks, opportunities and adaptation needs for the historic environment. Its aim is to stimulate action through strategies, programmes and partnerships.	The draft Drought plan should seek to reduce its contribution to climate change and aim to assist in the protection of the historic environment within the operational area. The SEA assessment framework should consider the effects of the draft Drought Plan on climate change and associated effects on the historic environment

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
HM Government (2016) National Infrastructure Delivery Plan 2016-2021	
This plan updates and replaces the previous National Infrastructure Plan and takes a targeted approach to infrastructure investment and delivery across different sectors over five years. These are all critical to support economic growth through the expansion of private sector businesses across all regions and industries, to enable competitiveness and to improve the quality of life of everyone in the UK. The plan recognises the pressure on future water and waste services from population growth and climate change.	The WRMP could result in the production of additional waste. The SEA should seek to reduce the production of waste and ensure it is treated in line with the widely adopted 'waste hierarchy' and not sent to landfill. The WRMP can contribute to the providing resilient water services.
HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment	
This plan sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in cities and rural landscapes, protect threatened species and provide richer wildlife habitats – using a natural capital approach to better-inform policy. By adopting the plan, the government aims to achieve clean air; clean and plentiful water; thriving plants and wildlife; a reduced risk of harm from environmental hazards such as flooding and drought; using resources from nature more sustainably and efficiently; and enhanced beauty, heritage and engagement with the natural environment. In addition, the plan will set out to manage pressures on the environment through; mitigating and adapting to climate change, minimising waste, managing exposure to chemicals and enhancing biosecurity. The six key areas for action are: • Using and managing land sustainably, which includes embedding an 'environmental net gain' principle for development (including housing and infrastructure) • Recovering nature and enhancing the beauty of landscapes • Connecting people with the environment to improve health and wellbeing • Increasing resource efficiency, and reducing pollution and waste • Securing clean, productive and biologically diverse seas and oceans Protecting and improving the global environment	The WRMP may influence the environmental benefits and pressures identified in the Environment Plan, such as: • Clean air • Clean and plentiful water • Thriving plants and wildlife • Reducing risks of harm from environmental hazards • Using resources from nature more sustainably and efficiently • Enhancing beauty, heritage and engagement with the natural environment • mitigating and adapting to climate change • minimising waste • managing exposure to chemicals • enhancing biosecurity The SEA should ensure that the impacts of any WRMP options on the 25-year goals set out in the Environment Plan are fully considered, whilst taking into account environmental net gain and natural capital approach, which the government have identified as principle themes.
HM Government (2020) Energy White Paper: Powering our Net Zero Future	
The white paper outlines a series of policies and commitments made by the government as part of the transition to net zero carbon emissions. The strategies are threefold: Prioritisation of renewable sources energy generation and invest in low-carbon technologies	The implementation of the WRMP may have an influence upon the Cambridge Water area's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Supporting a green recovery from COVID-19 through investment in green industries Creating a fair deal for consumers through facilitating competition, enhanced regulation and strategies to improve the energy performance of homes.	greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
HM Government (2021) Net Zero Strategy: Build Back Greener	
This strategy sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050. It builds on the approach of the Ten Point Plan to keep us on track for UK carbon budgets, our 2030 Nationally Determined Contribution, and net zero by 2050. It includes: • our decarbonisation pathways to net zero by 2050, including illustrative scenarios • policies and proposals to reduce emissions for each sector • cross-cutting action to support the transition The Net Zero Strategy was submitted to the United Nations Framework Convention on Climate Change (UNFCCC) as the UK's second Long-Term Low Greenhouse Gas Emission Development Strategy under the Paris Agreement.	The WRMP may include options which have an impact on carbon emissions. The SEA should seek to take the Net Zero Strategy into account and include an objective on carbon emissions.
HM Treasury Infrastructure UK (2014) National Infrastructure Plan	
The Plan focusses on economic infrastructure: the networks and systems in energy, transport, digital communication, flood protection, water and waste management. These are all critical to support economic growth through the expansion of private sector businesses across all regions and industries, to enable competitiveness and to improve the quality of life of everyone in the UK. The objectives for the water sector are 'to secure a fair deal for customers while enabling water companies to continue to attract low-cost investment needed to provide the high quality, resilient water services customers want.'	The SEA objectives should take into account the objectives for the water sector presented in this plan.
Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework	
The NPPF sets out the Government's planning policies for England. The revision to the NPPF published in February 2019 broadly continues the guidance set out in the 2012 NPPF, with more emphases on housing, design, efficient use of land and continued reference to an objective of achieving net gains. It constitutes guidance for local planning authorities and decision-takers both in drawing up plans and as a material consideration in determining applications. At the heart of the NPPF is a presumption in favour of sustainable development. However, the 'presumption in favour of sustainable development' is not applicable where any adverse impacts would significantly outweigh the benefits, when assessed against all policies in the NPPF or where specific policies indicate development should be restricted. This includes proposed developments that affect European designated sites, Green Belt or AONB land. It presents guidance under broad themes which include: Promoting healthy and safe communities; Meeting the challenge of climate change, flooding and coastal change; Conserving and enhancing the natural environment; and Conserving and enhancing the historic environment.	Any permanent construction activities in the WRMP should take account of the key components of the NPPF to ensure sustainable development and seek to promote biodiversity net gain.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Natural England (2011) UK Geodiversity Action Plan	
The UKGAP sets out of framework for geodiversity action across the UK. It provides a shared context and direction for the protection and enhancement of geodiversity through a common aim, themes, objectives and targets which link national, regional and local activities. The UKGAP consists of six broad themes: 1. Furthering our understanding of geodiversity 2. Influencing planning policy, legislation and development design 3. Gathering and maintaining information on our geodiversity 4. Conserving and managing our geodiversity 5. Inspiring people to value and care for our geodiversity 6. Sustaining resources for our geodiversity	The WRMP should have regard to the aims and objectives of the UKGAP. The SEA framework should consider effects of options on geodiversity and outline enhancement and mitigation opportunities where these are identified.
Natural Environment and Rural Communities Act (2006)	
This Act makes provision about bodies concerned with the natural environment and rural communities in connection with wildlife, sites of special scientific interest, National Parks and the Broads. The Natural Environment and Rural Communities Act is designed to help achieve a rich and diverse natural environment and thriving rural communities.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity. The impacts of the WRMP on any designated features, as highlighted in the Natural Environment and Rural Communities Act, should be addressed.
Planning (Listed Buildings and Conservation Areas) Act 1990	
This Act addresses listed buildings including the prevention of deterioration and damage and preservation and enhancement of conservation areas.	The WRMP and SEA should take account of the need to protect listed buildings and conservation areas.
Salmon and Freshwater Fisheries Act, 1975	
The Act lays down the present basic legal framework within which salmon and freshwater fisheries in England are regulated. Proposals have been made to extend the legislation to apply to more fish species e.g. coarse fish, eel and lamprey species. These proposals are currently under review. The Act covers legislation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement. Proposed extensions to the legislation (under review) include the provision of fish passes and screening of water abstraction and discharge points for coarse fish, eel and lamprey species.	The Act Provides statutory requirements for maintaining fish passage. The SEA will cover fish passage as an element of at least one sustainability objective. The SEA should seek to address any potential issues or effects on existing measures to address fish passage.
Salmon and Freshwater Fisheries Act, 1975	
The Act lays down the present basic legal framework within which salmon and freshwater fisheries in England are regulated.	The Act Provides statutory requirements for maintaining fish passage. The SEA will cover fish passage as an

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Proposals have been made to extend the legislation to apply to more fish species e.g. coarse fish, eel and lamprey species. These proposals are currently under review. The Act covers legislation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement. Proposed extensions to the legislation (under review) include the provision of fish passes and screening of water abstraction and discharge points for coarse fish, eel and lamprey species.	element of at least one sustainability objective. The SEA should seek to address any potential issues or effects on existing measures to address fish passage.
UKCP (2018) UK Climate Projections UKCP18	
The UKCP18 Projections provide a basis for studies of impacts and vulnerability and decisions on adaptation to climate change in the UK over the 21st century. Projections are given of changes to climate, and of changes in the marine and coastal environment; recent trends in observed climate are also discussed. The methodology gives a measure of the uncertainty in the range of possible outcomes; a major advance beyond previous national scenarios. The Projections will allow planners and decision-makers to make adaptations to climate change. In order to do so they need as much good information as possible on how climate change will evolve. They are one part of a UK government programme of work to put in place a new statutory framework on, and provide practical support for, adaptation.	The WRMP should take account of UKCP18 projections in their formulation, taking account of climate change in its supply and demand projections. The SEA should also use UKCP18 projections in the broader assessment of climate change effects and any potential cumulative effects. For example, the ecological requirements of aquatic habitats that may be affected by the WRMP will also be influenced by climate change
The Water Act (2003) (as amended)	
The Water Act 2003 is in three Parts, relating to water resources, regulation of the water industry and other provisions. The four broad aims of the Act are: • The sustainable use of water resources • Strengthening the voice of consumers • A measured increase in competition • The promotion of water conservation.	The implementation of the WRMP may have an effect through its role in maintaining supplies of water. The SEA should seek to promote sustainable use of water resources.
The Water Environment (Water Framework Directive) Regulations (England and Wales) 2017	
These Regulations implement the Water Framework Directive and set out a range of statutory actions to secure and maintain Good Ecological Status or Potential for all water bodies designated under WFD.	The WRMP should seek to maintain, protect and improve ecological status across the region and prevent any deterioration of WFD status. The SEA will be informed by the parallel WFD compliance assessment of the WRMP.
Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010	
This makes provision for general duties of water undertakers including those associated with water resources management plans and sets out supply duties.	The WRMP must take into account this legislation.
Water Resources Act, 1991 (Amendment) Regulations 2009 SI3104	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Amends Water Resources Act 1991 by extending the use of Water Protection Zones and Works Notices, in particular to deal with harm to aquatic ecosystems caused by the physical characteristics of a water course or lake, such as quantity, structure and substrate of river/lake bed. Aligns the Water Resources Act with the hydromorphological requirements of the WFD.	The SEA should include objectives that cover hydromorphological aspects and seek to ensure that hydromorphological features within the plan are maintained or enhanced.
Water Resource Management Plan Regulations 2007	
These regulations prescribe how water undertakers in England and Wales are to prepare and publish water resources management plans in accordance with Section 37 of the Water Industry Act. This prescribes the method of publication of a draft water resources management plan, and how water undertakers are to deal with representations received in relation to a draft water resources management plan.	This is the UK regulatory basis against which all water undertakers must be compliant in the production of their individual WRMPs.
Wildlife and Countryside Act (as amended) (1981)	
The Act is the principle mechanism for providing legislative protection of wildlife in Great Britain. Species listed in Schedule 5 of the Act are protected from disturbance, injury, intentional destruction or sale. Other provisions outlaw certain methods of taking or killing listed species. This Act is brought up to date regularly to ensure the most endangered animals are on the schedule. The Act also improved protection for the most important wildlife habitats.	Some aspects of the WRMP may have effects on habitats and species. The SEA should seek to maintain or enhance the quality of habitats and biodiversity and take regard of protected species and habitats.
Regional	
Water Company (various) Drought Plans	
Drought Plans set out the steps that each water company will take through the stages of developing drought, drought, severe drought and recovery from drought to ensure their supply of water resources. Drought Plans must be produced by all water companies to fulfil their requirements under the Water Act 2003. Those neighbouring Drought Plans relevant to the Cambridge Water WRMP are: • Anglian Water • Affinity Water	The WRMP should take account of emerging neighbouring plans where appropriate.
Water Company (various) Water Resource Management Plans	
Water companies in England and Wales, are required to prepare, maintain and publish a WRMP under the Water Industry Act 1991, updated by the provisions in section 37A-D of the Water Act 2003 and the Water Act 2014. The plan must set out how a water company intends to maintain the balance between supply and demand for water over a minimum of a 25 year period. This is complemented by a water company drought plan, which sets out the short-term operational steps a company will take as a drought progresses. Those neighbouring WRMPs relevant to the Cambridge Water WRMP are. • Anglian Water	The WRMP should take account of emerging neighbouring plans where appropriate.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
• Affinity Water	
Sub-regional / Local	
Environment Agency (various) River Basin Management Plans	
River Basin Management Plans (RBMPs) set out how the water environment will be managed and provide a framework for more detailed decisions to be made. RBMPs set out a more integrated approach to river basin management based on the following principles: • Integrate and streamline plans and processes; • Set out a clear, transparent and accessible process of analysis and decision-making; • Focus at the river basin district level; • Work in partnership with other regulators; • Encourage active involvement of a broad cross-section of stakeholders; • Make use of the alternative objectives to deliver sustainable development; • Use Better Regulation principles and consider the cost-effectiveness of the full range of possible measures; • Seek to be even handed across different sectors of society and sectors of industry; • Seek to be even handed and transparent in the management of uncertainty; • Develop methodologies and refine analyses as more information becomes available. The Cambridge Water area is covered by the Anglian River Basin Management area.	The WRMP should reflect the broad objectives of these plans. The SEA objectives should reflect the need to manage water resources on a catchment basis in a sustainable manner
Local Planning Authority (various) Land Use Plans	
The Cambridge Water area covers a number of planning authorities. These have been identified as; • Cambridge • South Cambridgeshire • Huntingdonshire	Measures identified in the WRMP should be consistent with the Land Use Plans of those local authorities that will be affected by the plans.
Public Rights of Way Improvement Plans (ROWIP)	
These plans are prepared by local authorities to describe how improvements to the public rights of way network will be undertaken to provide a better experience for a range of users. ROWIPs are reviewed every ten years.	The WRMP may affect public rights of way (PRoW) for example due to construction. The SEA should include an objective that protects PRoW.
Environment Agency (various) Abstraction Licensing Strategies (CAMS process)	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
The CAMS process is used to assess how much water is available for abstraction, and where. Therefore, highlighting where water abstraction licences can be granted. A water abstraction licence is required to remove more than 20 cubic metres (4,400 gallons) of water per day from a river or stream, reservoir, lake or pond, canal or spring. The strategies aim to meet the water needs of the environment and to allow water users to sustainably exploit any surplus. Within the Cambridge Water area the following CAMS/ALS are in place: • Cam and Ely Ouse • Old Bedford including Middle Level • Upper Ouse and Bedford Ouse	The WRMP should take the CAMS into account. The SEA assessment should consider the effects of options on the availability and sustainability of water supply.
Cambridge City Council (2021) Biodiversity Strategy 2021-2030	
The council wants all City Council services to consider their net impact on biodiversity within their operations. This new strategy attempts to embed biodiversity principles and considerations across all Council service areas and the communities they serve. The strategy is also a way in which the council can monitor its progress against the strategy baseline to ensure the delivery of BNG commitments and Natural Cambridgeshire's 'Doubling Nature' Ambitions.	The impact of WRMP options on biodiversity resilience should be considered. The WRMP should take into account
Biodiversity Action Plans	
Local Biodiversity Action Plans (LBAPs) identify priority habitats and species at a local level, setting targets for their conservation and outlining the mechanisms for achieving these targets.	The impact of WRMP options on biodiversity and climate change resilience should be considered.
Local Planning Authorities (various) Water Cycle Studies that have been undertaken for housing growth points	
A water cycle study identifies tensions between growth proposals and environmental requirements on a local scale, and identifies potential solutions to addressing them. The water cycle studies within Cambridge Water area: • bring together all partners and stakeholders existing knowledge, understanding and skills • bring together all water and planning evidence under a single framework • understand the environmental and physical constraints to development • work alongside green infrastructure planning to identify opportunities for more sustainable planning • identifying water cycle planning policies and a water cycle strategy to help all partners plan for a sustainable future water environment.	The WRMP has the potential to impact on water resources, water supply and wastewater treatment, so should take account of development proposed within the area.
Cambridgeshire and Peterborough Minerals and Waste Local plan 2036 (2021)	
Over the plan period to 2036 Cambridgeshire and Peterborough will ensure a steady, adequate but sustainable supply of minerals to meet current and projected future need. There will be an increased commitment to the use	Mineral extraction has the potential to impact water resources and their pathways, and locations at which waste

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
of secondary and recycled aggregate over land won material, with restoration and aftercare placed at the forefront of planning decisions. As existing communities grow and new communities are formed, a network of waste management facilities will provide for the sustainable management of all wastes to the achievement of net self-sufficiency. A balance will be struck between meeting present and future needs, and maintaining and enhancing the social, environmental and economic vibrancy of the plan area.	is stored water resources are likely to be more susceptible to contamination. The WRMP should take this plan into consideration when considering resource options.
Cambridgeshire County Council Surface Water Management Plan (2014)	
The overall objectives of the SWMP are summarised as follows: • Engage with partners and stakeholders; • Map historical flood incident data; • Map surface water influenced flooding locations; • Identify areas at risk of surface water flooding, referred to throughout as 'wetspots'; • Assess, compare and prioritise wetspots for detailed assessment; • Identify measures, assess options and confirm preferred options for the prioritised wetspots; and • Make recommendations for next steps.	The WRMP has the potential to impact surface water resources so should take into account the objectives set out in the SWMP.
Cambridgeshire County Council's Climate Change and Environment Strategy 2022	
The council recognises that it needs to help towards tacking the climate and environmental crisis. The Cambridgeshire Net Zero by 2045 emissions Strategy describes how the council will deliver on its commitments and respond to the climate impact challenges it will need to face. 9 Priority Areas of the strategy: • Communication and engagement • New economic models • Low carbon buildings • Low carbon transport • Waste and Pollution • Green spaces • Peatland • Water management • Resilience of our services	The strategy identifies Water Management as a priority area. The WRMP needs to take into account the proposed actions stated in the strategy.
Cambridgeshire County Council (2021) Cambridgeshire Flood Risk Management Strategy 2021-2027	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Cambridgeshire county council recognises the importance of working with its communities and risk management authorities to create a safer and more resilient Cambridgeshire. The strategy identifies how the county council and other organisations will help local communities become more resilient to flooding and how flood risk will be managed between 2021 and 2027.	The WRMP has the potential to impact water resources resulting in changes to flood risk, the WRMP needs to take the local flood management strategy into consideration.
Anglian River Basin District Draft Flood Risk Management Plan 2021-2027	
The draft FRMP is a plan to manage significant flood risks in designated flood risk areas within the Anglian River Basin District as per the requirement of the Flood Risk Regulations (2009). The FRMP describes the main flood risk issues and changes in the Anglian River Basin District covering the following; River, Coastal and Tidal Flood Risk (FR); Surface Water FR; Groundwater FR; Sewer FR; Canal FR; Reservoir; Land Management; Coastal Erosion; and History of Flooding.	The WRMP options have the potential to impact upon flood risk areas within the Anglian River Basin District. The SEA must ensure the WRMP takes into account the district's flood risk strategies proposed.

APPENDIX D BASELINE ANALYSIS

BIODIVERSITY, FLORA AND FAUNA

Baseline Characteristics

Biodiversity comprises the variety of plants (flora) and animals (fauna) in an area, and their associated habitats. The importance of preserving biodiversity is recognised from an international to a local level. Biodiversity has importance in its own right and has value in terms of quality of life and amenity.

The assessment area includes a variety of sites that are designated at a European, national or local level as important for biodiversity, flora and fauna (**Table D-1**), including:

- 1 Ramsar Sites
- 1 Special Protection Areas (SPA)
- 2 Special Areas of Conservation (SAC)
- 50 Sites of Special Scientific Interest (SSSI)
- 1 National Nature Reserves (NNR)
- 20 Local Nature Reserves (LNR)

Table D-1 List of designated sites within the Cambridge Water SEA assessment area

Designation	Designated Site Names
Ramsar	Ouse Washes
SPA	Ouse Washes
SAC	Eversden and Wimpole Woods Ouse Washes
SSSI	Alder Carr Balsham Wood Barrington Pit Barrington Chalk Pit Berry Fen Buff Wood Caldecote Meadows Cam Washes Carlton Wood Cherry Hinton Pit Dernford Fen Elsworth Wood Eversden and Wimpole Woods Fleam Dyke Fowlmere Watercress Beds Fulbourn Fen

Designation	Designated Site Names
	Furze Hill Gamlingay Wood Gog Magog Golf Course Great Wilbraham Common Hardwick Wood Hatfield Forest Hayley Wood Hildersham Wood Histon Road Holland Hall (Melbourn) Railway Cutting Houghton Meadows Kingston Wood and Outliers L-moor, Shepreth Langley Wood Madingley Wood Orwell Clunch Pit Ouse Washes Over and Lawn Woods Overhall Grove Papworth Wood Potton Wood Roman Road Sawston Hall Meadows Stow-cum-Quy Fen Therfield Heath Thriplow Meadows Thriplow Peat Holes Traveller's Rest Pit Warboy's and Wistow Wood Warboys Claypit Waresley Wood Weaveley and Sand Woods Whittlesford - Thriplow Hummocky Fields Wilbraham Fens Woodwalton Fen
NNR	Woodwalton Fen
LNR	Barnwell Barnwell II

Designation	Designated Site Names
	Bramblefields
	Byron's Pool
	Coldham's Common
	East Pit
	Kingston Amenity Area
	Limekiln Close (and West Pit)
	Logan's Meadow
	Mare Fen
	Melwood
	Nine Wells
	Paradise
	Sheep's Green and Coe Fen
	Somersham
	St Denis Church
	The Beechwoods
	Therfield Heath
	Worts Meadow

A proportion of the designated sites within the assessment area are water dependent and therefore changes in the water regime (surface or groundwater) through abstraction, discharges and pollution could potentially affect the integrity and condition of these designated sites. The main potential effects that the SEA needs to take into account with regard to designated sites include:

- Groundwater level impacts on terrestrial habitats as a result of abstraction from surface water or groundwater.
- Flow/level impacts on aquatic habitats as a result of abstractions.
- Water pollution (point and diffuse sources).
- Effects on species or habitats associated with the increased occurrence of eutrophication where freshwater levels are insufficient to dilute sewage discharges or agricultural runoff. This is also an issue in estuaries where high tides lead to the re-suspension of organic matter and solids.
- Increased turbidity and concentration of other pollutants due to reductions in freshwater dilution.
- Changes in channel morphology leading to the loss, fragmentation or disturbance of habitats.

In addition to the abstraction of water and discharges to water, the construction of infrastructure associated with the distribution of water through pipelines and pumping stations can also have adverse effects on designated sites of nature conservation importance.

There are a range of designated Natural Environment and Rural Communities (NERC) Act Section 41 habitats within the Cambridge Water supply area[34]. NERC habitats include coastal and floodplain grazing marsh, lowland meadows, lowland fens, deciduous woodland, traditional orchards and fens. NERC priority species include:

[34] Defra MAGIC Interactive map: Habitat Inventories (http://magic.defra.gov.uk/)

- Otter
- Water vole
- Atlantic salmon
- European eel
- Sea/Brown trout
- River lamprey
- White clawed crayfish
- Snakeshead Fritillary
- Loddon Lilly
- Creeping Marshwort
- Narrow-leaved water-dropwort
- River water-dropwort
- Fine-lined pea Mussel
- Freshwater Pea Mussel
- Depressed River Mussel
- Greater Water Parsnip
- Club-tailed Dragonfly
- Tassel Stonewort
- Desmoulins Whorl Snail
- Snipe
- Lapwing Natterer's Bat
- Daubenton's Bat
- Pipistrelle Bat

Ancient Woodlands

Ancient woodlands in England are important habitats that should be protected. An ancient woodland is any wooded area that has contained woodland continuously since at least 1600 AD. They tend to be more ecologically diverse and of a higher nature conservation value than those developed recently, or where cover on the site has been intermittent. They often also have cultural importance. There are 9.7 km^2 of ancient woodland within the SEA area under consideration. Areas of ancient woodland are shown on **Figure D.2**

Chalk Streams

Chalk streams are rare and valuable habitat and out of only around 200 chalk streams in the world, 85% are found in England, reflecting the countries geology and temperate climate. The chalk streams emerge from chalk aquifers and are characterised by their very pure, mineral-rich water which stays at a relatively constant temperature year-round providing a suitable habitat to diverse aquatic plant species such as water-crowfoot and water star-wort which supports many invertebrate and fish species. The unique and diverse ecology of chalk streams makes them a globally rare and important habitat.

In Cambridge, Bin Brook, Cherry Hinton Brook, Coldham's Brook, Hobson's Brook and Vicar's Brook are all examples of chalk streams. The chalk aquifer they emerge from also acts as a crucial drinking water resource. In the Cambridge Water supply area, 100% of the water stems from the chalk aquifer which lies to the south and east of Cambridge. Businesses and farms in the region also rely on these water resources.

Cambridge Water, together with Cambridge City Council, commissioned the Wildlife Trust and Wild Trout Trust to assess the health of local chalk streams. The report[35] provides an overview of each river and the main issues affecting it and highlights key opportunities and potential projects. The Environment Agency's WFD classifications show that most chalk streams are not in good health. Current threats to chalk stream ecology include flow pressures, channel modifications and poor water quality.

Natural Character Areas

Natural England has defined a series of 160 National Character Areas (NCAs) as a means to conserve nature in England[36]. These are areas of countryside identified by the unique combination of physical attributes, wildlife, land use and culture. Key messages regarding habitat type are and National Character Areas (NCAs) that cover the assessment area are shown in **Figure D.3** (under the Landscape topic).

[35] https://www.cambridge.gov.uk/media/9067/greater-cambridge-chalk-streams-project-report.pdf

[36] Natural England (2014) Natural Character Area Profiles. https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles

Water Framework Directive – ecological status

The WFD ecological status classification considers the condition of biological quality elements (e.g. aquatic invertebrates, plants and fish), the morphology of the habitat available in each water body (e.g. a defined stretch of river), and concentrations of supporting physico-chemical elements (e.g. oxygen or ammonia and concentrations of specific pollutants).

Water abstraction and associated infrastructure can sometimes result in adverse effects on water-related sites. Impacts on biodiversity may be caused by the drying out of wetland habitats, lower water levels and slower flows in watercourse, deterioration in water quality, change in water temperature, or the transfer or proliferation of invasive species. The WFD River Basin Management Plans (RBMPs) relevant to the study area identify changes to the natural flow and level of water as one of the major issues affecting the ecology of rivers – these being related to abstraction and flow regulation measures.

The Anglian River Basin Management Plan[37] (RBMP) outlines significant water management issues which can have impacts on the aquatic habitats and species. 51% of water bodies in the River Basin District (RBD) are subject to physical modifications, 50% of watercourses experience pollution from wastewater, 47% from rural areas, 10% from towns, cities and transport, 10% are affected by changes to natural flow and INNS have negative effects on 6% of watercourses.

Invasive Non-Native Species

There are over 2,000 non-native species established (reproducing in the wild) in Britain, predominantly in the terrestrial environment[38]. Invasive species within the Cambridge Water WRMP assessment area include species such as pennywort, Himalayan balsam, signal crayfish and giant hogweed[39].

[37] Environment Agency (2015) Part 1: Anglian river basin district: River Basin Management Plan. December 2015

[38] https://jncc.gov.uk/our-work/ukbi-b6-invasive-species/

[39] Cambridge City Council (2020) Greater Cambridge Chalk Streams Project Report https://www.cambridge.gov.uk/media/9067/greater-cambridge-chalk-streams-project-report.pdf)

Figure D.1 Designated Sites

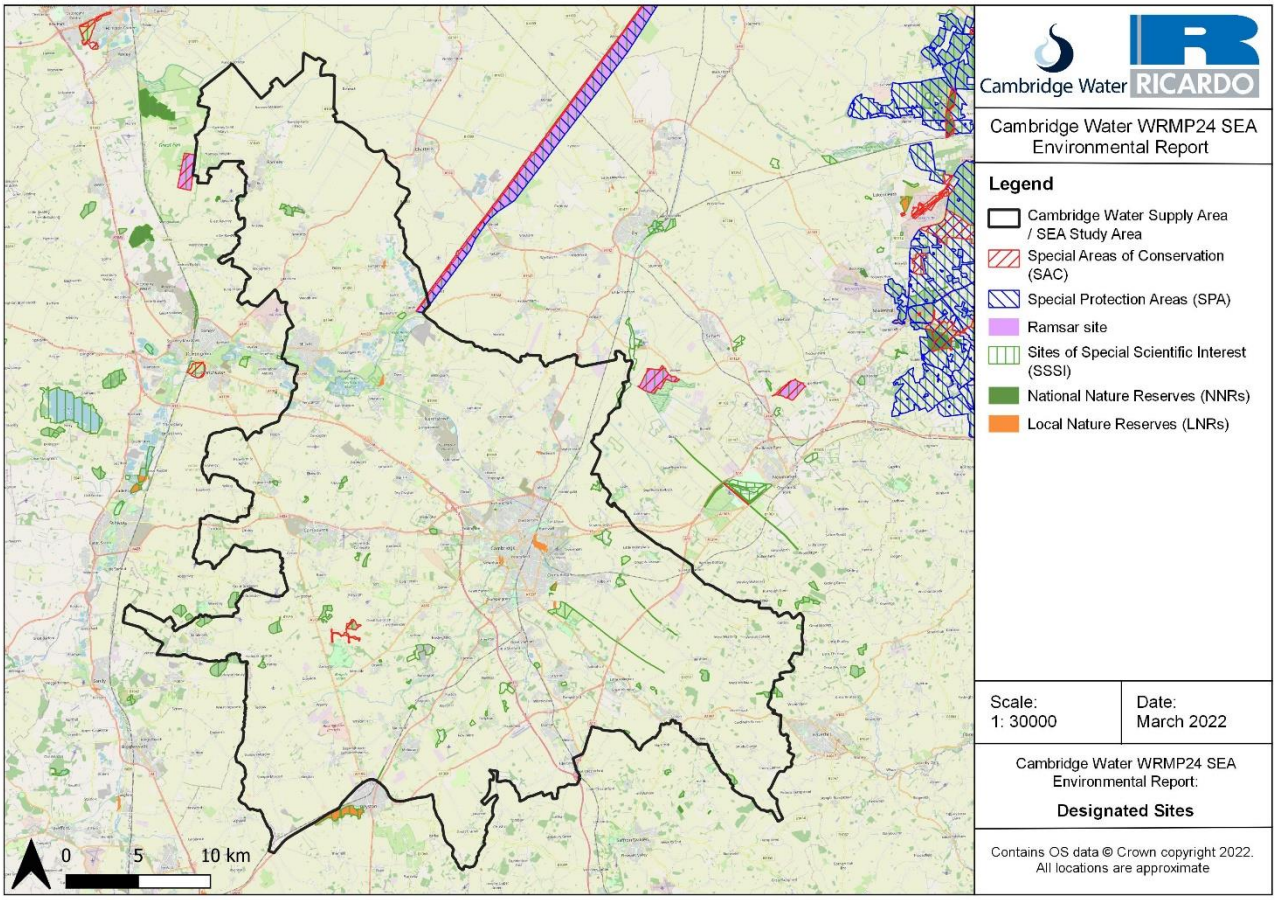
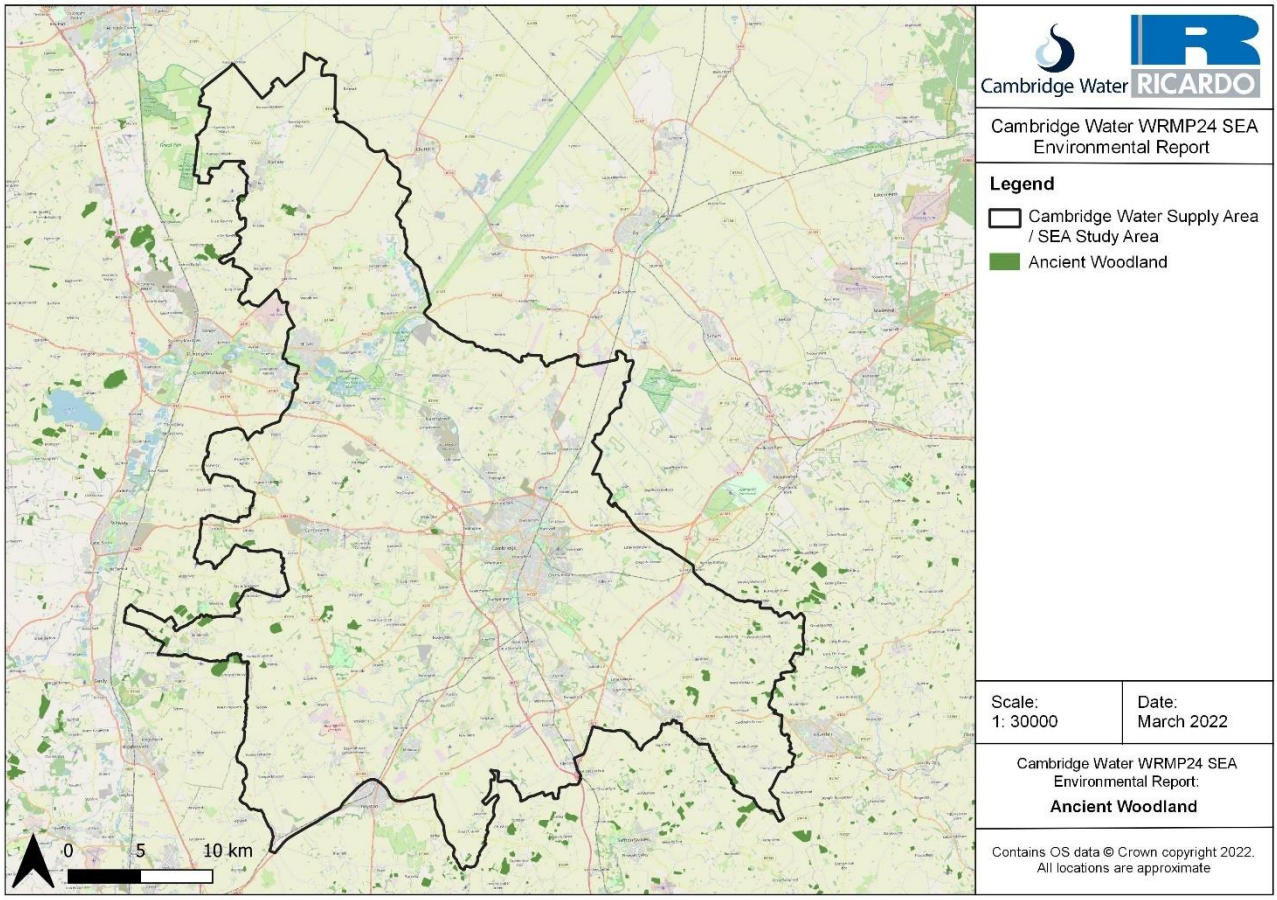


Figure D.2 Ancient Woodland



Likely Evolution of the Baseline without the WRMP

The Defra 25 Year Environment Plan[40] includes a commitment to restore 75% of terrestrial and freshwater protected sites to favourable condition and to create or restore 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits. The 25 Year Plan also proposed an adoption of a 'Biodiversity Net Gain' approach to development, an approach introduced into national planning policy in 2019. The Environment Act[41] enacted in 2021 has now mandated the need for Biodiversity Net Gain assessment.

The 25-year Plan also includes a commitment to support land management at landscape and catchment level and to support the adoption of long-term sustainable land management practices to significantly expand wildlife habitat and provide opportunities for species and ecosystem recovery.

Climate change is anticipated to have an impact on wildlife in the future by exacerbating existing pressures such as changes to the timing of seasonal activity, and water scarcity. It is acknowledged that there is a need to allow wildlife to adapt to the impacts of climate change. Climate may limit species' distributions indirectly though the impact of invasive species on native species along climatic gradients. It will affect the abundance and diversity of natural enemies, competitors and species that constitute resources, as well as a species' ability to compete for resources or resist natural enemies.

Natural Cambridgeshire Local Nature Partnership (LNP) is a cross-sector partnership working to restore the natural environment in the Cambridgeshire area through embedding the value of nature in decision making across spatial planning, public health and economic development. It is the designated Local Nature Partnership (LNP) for Cambridgeshire and Peterborough. LNPs are a key commitment from the 2011 Government White Paper, The Natural Choice: Securing the Value of Nature, which recognised the need for a more joined-up

[40] UK Government (2018) 25 Year Environment Plan. https://www.gov.uk/government/publications/25-year-environment-plan
[41] UK Government (2021) Environment Act. https://www.legislation.gov.uk/ukpga/2021/30/part/1/enacted

approach to reverse the loss of biodiversity and degradation of ecosystems. Natural Cambridgeshire LNP has a vision to double nature including land managed for nature in Cambridgeshire by 2050 by focussing on six strategic areas: living landscapes, local food and farming, better places to live, sustainable jobs, healthy communities and heritage, culture and leisure and with a number of direct delivery projects in development that support the doubling nature vision and strategic projects that underpin the delivery of that vision.

In 2017, Cambridge Water launched PEBBLE (Projects that Explore Biodiversity Benefits in the Local Environment) fund, a biodiversity improvement fund which provides grants for projects that look to improve, restore and or create habitat within the Cambridge Water supply area. Since its launch, the fund has helped over 28 projects, improving over 80 hectares over five years. This is one example of local environmental initiatives and growing community activities which will aid in strengthening people's connection with wildlife and nature and contribute to the overall improvement in the condition of these areas.

Key Issues Relevant to the WRMP

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

- The need to protect or enhance the region's biodiversity, particularly protected sites designated for nature conservation and rare and valuable habitat such as chalk streams.
- The need to avoid activities likely to cause irreversible damage to natural heritage.
- The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors.
- The need to recognise the importance of allowing wildlife to adapt to climate change.
- The need to control the spread of Invasive Non-Native Species (INNS).
- 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 ecosystem services.

SOILS, LAND USE AND GEOLOGY

Baseline Characteristics

Geology

The Cambridge Water assessment area is geologically diverse and includes a number of major aquifers such as the Cam and Ely Ouse Chalk and North Essex Chalk. Geological sites may be sensitive to changes in water levels and quality, pollution and land use.

England has been divided into areas with similar landscape character, which are called National Character Areas (NCAs). Character descriptions for each of the NCAs were produced and published in regional volumes to highlight the influences determining the character of the landscape, including surface geology. Relevant NCA boundaries are shown in **Figure D.3**. A brief description of the key soil, geological and land use characteristics of each of the main character areas is provided in **Table D-2**.

Table D-2 Landscape Character Areas: Soil, Geology and Land Use Characteristics

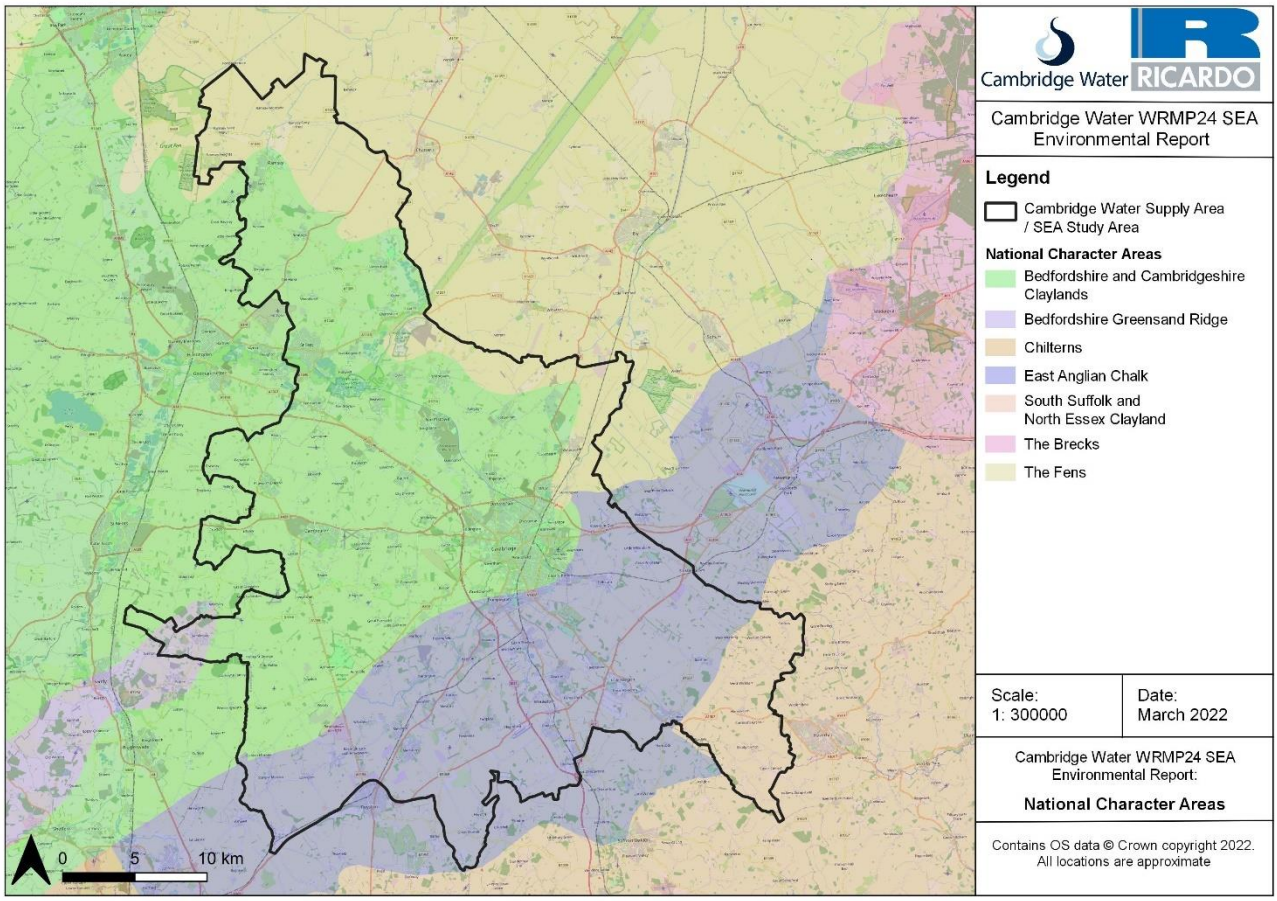
Area (Shown in Figure D.4)	Characteristics
The Fens	Jurassic clays are overlain by rich, fertile calcareous and silty soils over the coastal and central fens and by dark, friable fen peat further inland. The soils are important for agriculture, which is hugely significant for the rural economy in the Fens. There are over 4,000 farms in the Fens; enough wheat is grown here annually to produce a quarter of a million loaves of bread and one million tons of potatoes are grown here. In addition to traditional vegetables, exotics such as pak choi are now cultivated. Some 40 % of England's bulbs and flowers are also produced in the Fens.

Area (Shown in Figure D.4)	Characteristics
South Suffolk and North Essex Clayland	The widespread moderately fertile, chalky clay soils give the vegetation a more or less calcareous character. Gravel and sand deposits under the clay are important geological features, often exposed during mineral extraction, which contribute to our understanding of ice-age environmental change. Fragments of chalk give many of the soils a calcareous character, which also influences the character of the semi-natural vegetation cover.
East Anglian Chalk	The underlying and solid geology is dominated by Upper Cretaceous Chalk, a narrow continuation of the chalk ridge that runs south-west–north-east across southern England, continuing in the Chilterns and along the eastern edge of The Wash. The chalk bedrock has given the NCA its nutrient-poor and shallow soils.
Bedfordshire and Cambridgeshire Claylands	Underlying geology of Jurassic and Cretaceous clays overlain by more recent Quaternary glacial deposits of chalky boulder clay (till) and sand and gravel river terrace deposits within the river valleys. Lime-rich, loamy and clayey soils with impeded drainage predominate, with better-drained soils in the river valleys.
Bedfordshire Greensand Ridge	Well-drained acidic sandy soils are capped in places with drift deposits of Boulder Clay. Sand and gravel deposits are present in the Ouzel valley, and there are deposits of peat in the Flit valley between Flitwick and Clophill. Much of the Ridge has acidic, free-draining soils which are less fertile than the surrounding Claylands and historically suitable for hunting estates of heath and mixed woodland. In the more fertile river valleys there is some pasture and market gardening. A variety of sand types occur here, including a pure 'silver sand' quarried especially around Heath and Reach, which is both important and famous for glass-making. Fuller's earth has been worked from large quarries at Woburn Sands and Clophill.

Geological Conservation Review (GCR) Sites is the register of known nationally and internationally important earth science (geological and geomorphological) sites in Great Britain[42]. The GCR underpins the designation of earth science features in SSSIs. There are 5 GCR sites in the Cambridge Water supply area.

[42] Geological Conservation Review. http://jncc.defra.gov.uk/page-2947

Figure D.3 National Character Areas



Soils and Land Use

The Agricultural Land Classification (ALC) was developed by Defra to provide a means of assessing the agricultural land suitability. The 'best and most versatile land' is generally defined as agricultural land that is at Grade 1, 2 or 3a, with Grade 1 being the best.

Figure D.4 shows that the majority of agricultural land in the assessment area is classified as Grade 2 ('Very Good'), with pockets of Grade 1 ('Excellent') soils to the north. Soil quality and structure is affected by changes in land use, groundwater levels and farming practices. Soil quality can influence run-off rates and therefore flooding and water quality. The majority of land in the assessment area is farmed and agricultural practices have a major influence on soil quality. Good soil structure is beneficial to water retention and crop yield.

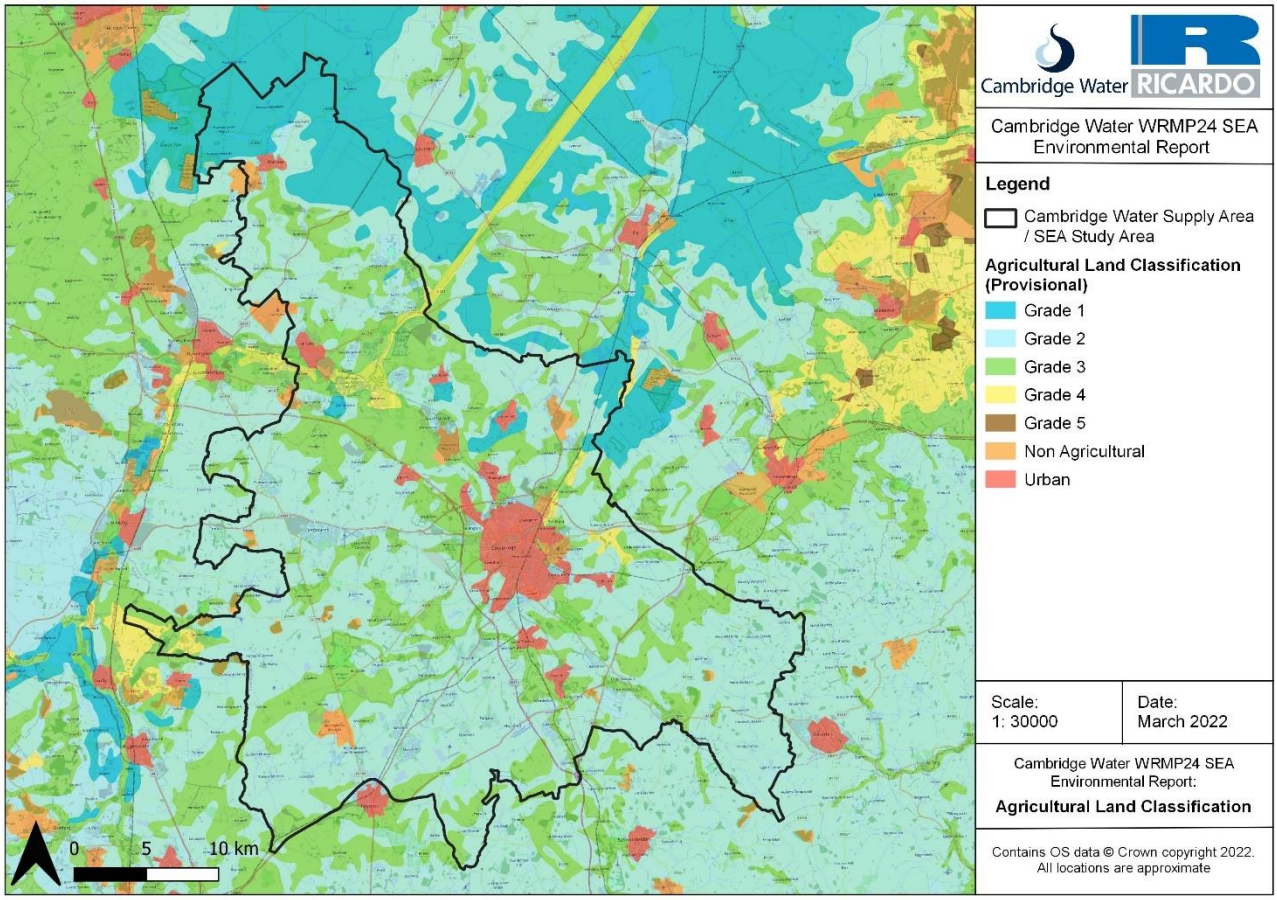
Ministry of Housing, Communities and Local Government data states that for the East of England region and England, land that is not developed constitutes 92.1% and 91.5% respectively of total land area. The single largest land use in the East is agriculture, constituting 71.2% of total land (this is considered to be land that is not developed). Within developed land, the single largest use is Transport and Utilities, which constitutes 4.2% of total land use. Water equates to 1.6% of the total non-developed area of land within the East of England compared to 1.4% nationally[43].

Contaminated land is defined as land where substances could cause significant harm to people or protected species; or significant pollution of surface waters or groundwaters. Some types of contaminated land can be designated as special sites for a variety of reasons, including land that seriously affects drinking water, surface waters (e.g. lakes and rivers) and important groundwater sites. A contaminated land register for the Cambridge area is provided on the Cambridgeshire City Council website; all listed sites are said to be fully remediated and suitable for use[44].

[43] Live tables on land use - GOV.UK (www.gov.uk), Total land area by usage type, Land Use Statistics England 2018

[44] https://www.cambridge.gov.uk/contaminated-land

Figure D.4 Agricultural Land Classification



Likely Evolution of the Baseline without the WRMP

The vision of Defra's Soils Strategy for England[45] is for all England's soils to be managed sustainably and degradation threats tackled successfully by 2030. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.

One of the core planning principles of the NPPF[46] is to encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value. The NPPF also places great importance on Green Belt policy, the aim of which is to prevent urban sprawl by keeping land permanently undeveloped. Green Belt serves five purposes: to check the unrestricted sprawl of large built-up areas; to prevent neighbouring towns merging into one another; to assist in safeguarding the countryside from encroachment; to preserve the setting and special character of historic towns; and to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

The 25 Year Environment Plan (2018) runs alongside the Industrial Strategy (2017) and outlines the government's approach to safeguarding the environment and sustainable management of the economy. It introduces reforms to incentivised land management following Brexit. The plan details the Environmental Land Management scheme (ELMs); the evolution of the Common Agricultural Policy (CAP) following exit from the EU. The ELMs includes three new schemes designed to support the rural economy and the government's commitment to net zero emissions by 2050. The first of these schemes, the Sustainable Farming Incentive, will pay farmers to manage their land in an environmentally sustainable way. The scheme designates standards based on a feature such as hedgerows or grassland, and contains a series of actions required to meet the criteria. The scheme is currently being piloted but is due to launch in 2022. The Local Nature

[45] Defra (2009) Safeguarding our soils – A Strategy for England

[46] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

Recovery Scheme is intended to encourage collaboration between farmers and will pay for actions that support nature recovery which meet local environmental priorities. The Local Nature Recovery Scheme is due to launch in 2024. Finally, the Landscape Recovery scheme support long-term projects to recover landscape and ecosystems. Examples of projects include the restoration of peatland and salt marshes, large-scale tree planting and the re-wilding of landscapes where appropriate. Again, this scheme is due to come online in 2024.

Key Issues Relevant to the WRMP

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

The need to protect geological features of importance and maintain and enhance soil function and health.

The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).

The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region.

WATER

Baseline Characteristics

In the context of the Water Framework Directive (WFD), the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. The aquatic environment has been characterised as part of the UK Government's reporting obligations to the EU under the WFD and this provides the most appropriate baseline reference.

The WFD brings together the planning processes of a range of other European Directives. These Directives establish protected areas to manage water, nutrients, chemicals, economically significant species, and wildlife, and have been brought in line with the planning timescales of the WFD. Although the UK has left the European Union, European Law and policy has formed the basis for UK environmental laws and contributed to the direction of UK policy in these areas for many years up to 30 January 2020. As such, the WFD is considered to remain a useful contextual frame for this baseline review.

Surface Waters: Rivers and Canals

The assessment area falls within the Anglian River Basin District and is comprised of the following management catchments:

- Old Bedford and Middle Level
- Upper and Bedford Ouse
- Cam and Ely Ouse
- Combined Essex

The most significant watercourses being the River Ouse and River Cam. **5** shows the distribution of surface waters in the assessment area.

Surface Waters: Lakes and Reservoirs

Currently, Cambridge Water has no surface water reservoirs. There are a number of lakes, pits and surface water features in the area, although none are used for water resource abstraction by Cambridge Water.

Groundwater

The majority of groundwater that Cambridge Water abstracts is sourced from the Cam and Ely Ouse Chalk aquifer (**5**). The most recent Abstraction Licensing Strategy for the Cam and Ely Ouse catchment[47] suggests that no groundwater is available for new consumptive abstraction across all groundwater units. The main pressures on groundwaters are abstraction for drinking water supply and contamination with nitrates and

[47] https://www.gov.uk/government/publications/cam-and-ely-ouse-abstraction-licensing-strategy/cam-and-ely-ouse-abstraction-licensing-strategy#availability

pesticides. Unsustainable abstraction from groundwater can lower groundwater levels and affect dependent river flows or wetlands, or can induce the intrusion of poorer quality water from the sea or from deeper aquifers.

Under the WFD, there are two separate classifications for groundwater bodies, chemical status and quantitative status. A groundwater body will be classified as having poor quantitative status in the following circumstances: where low groundwater levels are responsible for an adverse impact on rivers and wetlands normally reliant on groundwater, where abstraction of groundwater has led to saline intrusion, and where it is possible that the amount of groundwater abstracted will not be replaced each year by rainfall. For a groundwater body to be at good status overall, both chemical status and quantitative status must be good. In addition to assessing status, there is also a requirement to identify and report where the quality of groundwater is deteriorating as a result of pollution and which may lead to a future deterioration in status.

The Cycle 2 classifications for the Cam and Ely Ouse groundwater body is poor overall, with both chemical and quantitative status also poor. The main reasons for not achieving good status (RNAGs) are poor nutrient management resulting in high nitrate concentrations and groundwater abstraction levels exceeding the rate at which the aquifer can recharge.

Source Protection Zones (SPZ) provide additional protection to safeguard drinking water quality. This is achieved through constraining the proximity of an activity that may impact upon drinking water abstraction. They are defined around large and public potable groundwater abstraction sites, and the groundwater travel time to an abstraction.

Catchment Abstraction Management System

Catchment Abstraction Management System (CAMS) set out how the Environment Agency will manage the water resources of a catchment and contribute to implementing the WFD. The CAMS process is used to translate the RBMPs and Water abstraction plan into the licensing policy. CAMS is a standard approach to assess the amount of water available for further abstraction licensing, taking into account the requirements for the environment.

Abstraction licensing strategies (ALS) are published as part of the CAMS process. They are produced for each management catchment. **Table D-3** summarises the resource availability at each assessment point within the management catchments that fall wholly, or partially, within the assessment area.

Table D-3 Resource availability in the WFD Management Catchments in the Cambridge Water supply area

		Resource Availability		GWMU only
		Q50	**Q95**	
Cam and Ely Ouse[48]	AP1 – Old West	Restricted	Not available	
	AP2 – River Granta and Chalk	Not available	Not available	
	AP3 – Upper River Granta and Chalk	Not available	Not available	
	AP4 – River Rhee and Chalk	Not available	Not available	
	AP5 – Bourn Brook	Restricted	Not available	
	AP6 – Lower River Cam and Chalk	Restricted	Not available	
	AP7 – River Snail and Chalk	Restricted	Not available	

[48] https://www.gov.uk/government/publications/cam-and-ely-ouse-abstraction-licensing-strategy/cam-and-ely-ouse-abstraction-licensing-strategy

		Resource Availability		GWMU only
		Q50	Q95	
	AP8 – River Kennett and Chalk	Restricted	Not available	
	AP9 – Upper River Lark and Chalk	Restricted	Not available	
	AP10 – Lower River Lark and Chalk	Restricted	Not available	
	AP11 – River Sapiston and Chalk	Restricted	Not available	
	AP12 – Upper Little Ouse and Chalk	Restricted	Not available	
	AP13 – River Thet and Chalk	Restricted	Not available	
	AP14 – Lower Little Ouse and Chalk	Restricted	Not available	
	AP15 – Upper River Wissey and Chalk	Restricted	Not available	
	AP16 – Lower River Wissey and Chalk	Restricted	Not available	
	AP17 – Denver Sluice	Restricted	Not available	
Upper Ouse and Bedford Ouse[49]	AP1 - Earith	Restricted	Not available	
	AP2 - Brampton	Restricted	Not available	
	AP3 - Offord	Restricted	Not available	
	AP4 - Kym	Restricted	Not available	
	AP5 - Roxton	Restricted	Not available	
	AP6 - Ivel	Restricted	Not available	
	AP7 – Flit and Campton	Restricted	Not available	
	AP8 - Hiz	Restricted	Not available	
	AP9 – Campton Brook	Restricted	Not available	
	AP10 - Flit	Restricted	Not available	
	AP11 - Bedford	Restricted	Not available	
	AP12 – Newport Pagnell	Restricted	Not available	

[49] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/636744/ALS_2017_Upper_Ouse_and_Bedford_Ouse.pdf

		Resource Availability		GWMU only
		Q50	Q95	
	AP13 – Broughton Brook	Not available	Not available	
	AP14 - Ouzel	Restricted	Not available	
	AP15 - Clipstone	Restricted	Not available	
	AP16 – Leighton Buzzard	Restricted	Not available	
	AP17 - Tove	Restricted	Not available	
	AP18 - Ouse	Restricted	Not available	
	AP19 - Buckingham	Restricted	Not available	
	AP20 - Twins	Restricted	Not available	
	Upper Bedford Ouse Woburn Sands			Not available
	Upper Bedford Ouse Oolite			Restricted
	Upper Bedford Ouse Chalk			Not available
Old Bedford and Middle Level[50]	Middle Level LDMU (Catchment 53)			Not available (Summer only)
	Counter Drain LDMU Supply (Catchment 52)			Not available (Summer only)
	Hundred Foot LDMU (Catchment 26)			Not available (Summer only)

Key Pressures

The SEA study area falls within the Anglian River Basin District (RBD), which covers an area of over 27,000km^2 where more than 50% of the land use is for agricultural and horticultural purposes. The key water management issues preventing waters within the RBD from reaching good status have been identified in the recent Draft River Basin Management Plans and for the Anglian RBD[51], these most significant issues were identified as; pollution from rural areas, physical modifications and pollution from wastewater. Some of the measures suggested that can address these issues include:

- Improving soil management to reduce the loss of soil, phosphate and nitrogen
- Improving use of pesticides to reduce pollution of the water environment

[50] Environment Agency (2017) Old Bedford including Middle Level abstraction licensing strategy https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/636776/ALS_2017_Old_Bedford.pdf

[51] DEFRA (2021) Anglian River Basin District Draft River Basin Management Plan Consultation https://environment.data.gov.uk/catchment-planning/v/c3-draft-plan/RiverBasinDistrict/5

- Reducing the amount of water abstracted from sensitive locations by using water more efficiently (including greater use of on-farm storage for agriculture), taking water from difference locations and reducing demand for water
- A stronger catchment focus for water resources, working collaboratively with stakeholders to find innovative solutions that give greater access to sustainable water that promotes catchments resilient to climate change
- Improving sewerage systems and sewage treatment works to reduce the amount of pollution discharged to the water environment
- Installing fish passes around physical modifications (for example, locks on navigable rivers

Water Quality

Since 2000, the health of waterbodies has been classified using a status based approach according to quality elements defined within Annex V of the WFD.

Surface water status is awarded on a 5 point scale (High, Good, Moderate, Poor, Bad), and overall scores are split into scores for ecological status and chemical status. For a waterbody to be in overall 'good' status, both ecological and chemical status must be at least 'good' (i.e. the lowest score out of ecological and chemical status also constitutes the waterbody's overall score). Ecological status classification considers the condition of biological quality elements (e.g. aquatic invertebrates, plants and fish), hydromorphological quality elements (the morphology of the habitat available). Chemical status considers the general chemical and physico-chemical quality elements (concentrations of supporting physico-chemical elements; and concentrations of specific pollutants).

Table D-4 summarises the key statistics for surface water quality, for the management catchments which cover Cambridge Water supply area.

Table D-4 Cycle 2 Surface Water Classifications data for WFD Management Catchments which fall under the assessment area

Ecological Status or Potential						
Management Catchment	Bad	Poor	Moderate	Good	High	Total
Old Bedford and Middle Level	0	0	6	0	0	6
Ouse Upper and Bedford	1	6	75	11	0	93
Cam and Ely Ouse	3	6	57	7	0	73
Essex Combined	0	14	52	4	0	70

Chemical Status or Potential		
Management Catchment	**Fail**	**Good**
Old Bedford and Middle Level	6 (100%)	0
Ouse Upper and Bedford	93 (100%)	0
Cam and Ely Ouse	73 (100%)	0
Essex Combined	70 (100%)	0

Flood Risk

Flooding can result from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.

The Environment Agency's Flood Risk Maps available on its website show areas at risk of flooding, including people, economic activity and the environment[52].

An estimated 5.2 million properties are at risk from flooding in England with the Environment Agency estimating a total of 121,000 residential properties in areas at high-risk of flooding from rivers and the sea and 458,000 in medium-risk areas. Surface water flooding is also a substantial threat, with 239,000 residential properties at high-risk of flooding.

Across the country, the Government budgeted £2.3bn on 1,500 flood defence schemes between 2015 -2021. The Environment Agency's Flooding in England report[53] highlighted that regionally, the East of England has far fewer people at risk of flooding compared with areas such as London and Yorkshire.

The extreme floods of 2007 prompted the Pitt Review (2008) and the subsequent Flood and Water Management Act 2010. In 2008-2009, the Environment Agency spent approximately £427 million on building, improving and keeping flood defences such as managed river channels, walls and raised embankments, flood barriers and pumps in good condition, which reduced the risk of flooding to over 176,000 households across England.

Under the Flood Risk Regulations 2009, the Environment Agency must produce and publish flood risk management plans at the river basin district scale[54]. Since 2009, there has been significant investment in flood defence schemes and other flood risk management measures, but during the same period the number and intensity of flooding incidents has also increased.

The Anglian River Basin District (RBD) covers 27,900km^2. It extends from Lincolnshire in the north to Essex in the south and from Northamptonshire in the west to the east coast of Norfolk, Suffolk, and Essex.

The RBD is particularly susceptible to large scale river flooding. There are a number of extensive rivers often with multiple tributaries. Very large fluvial events have occurred across the area, with some of these affecting multiple rivers at the same time. Surface water flooding is a problem in many towns and cities across the Anglian RBD including Cambridge[55]. Within the Anglian RBD there are:

• 16 Flood Risk Areas (FRAs) for significant risk of flooding from main rivers and the sea

• 12 FRAs for significant risk of flooding from surface water

The plan discusses prevention, protection and forecasting/warning measures including further measures implemented since 2015 including installation of infrastructure, flood warning and information systems across the RBD.

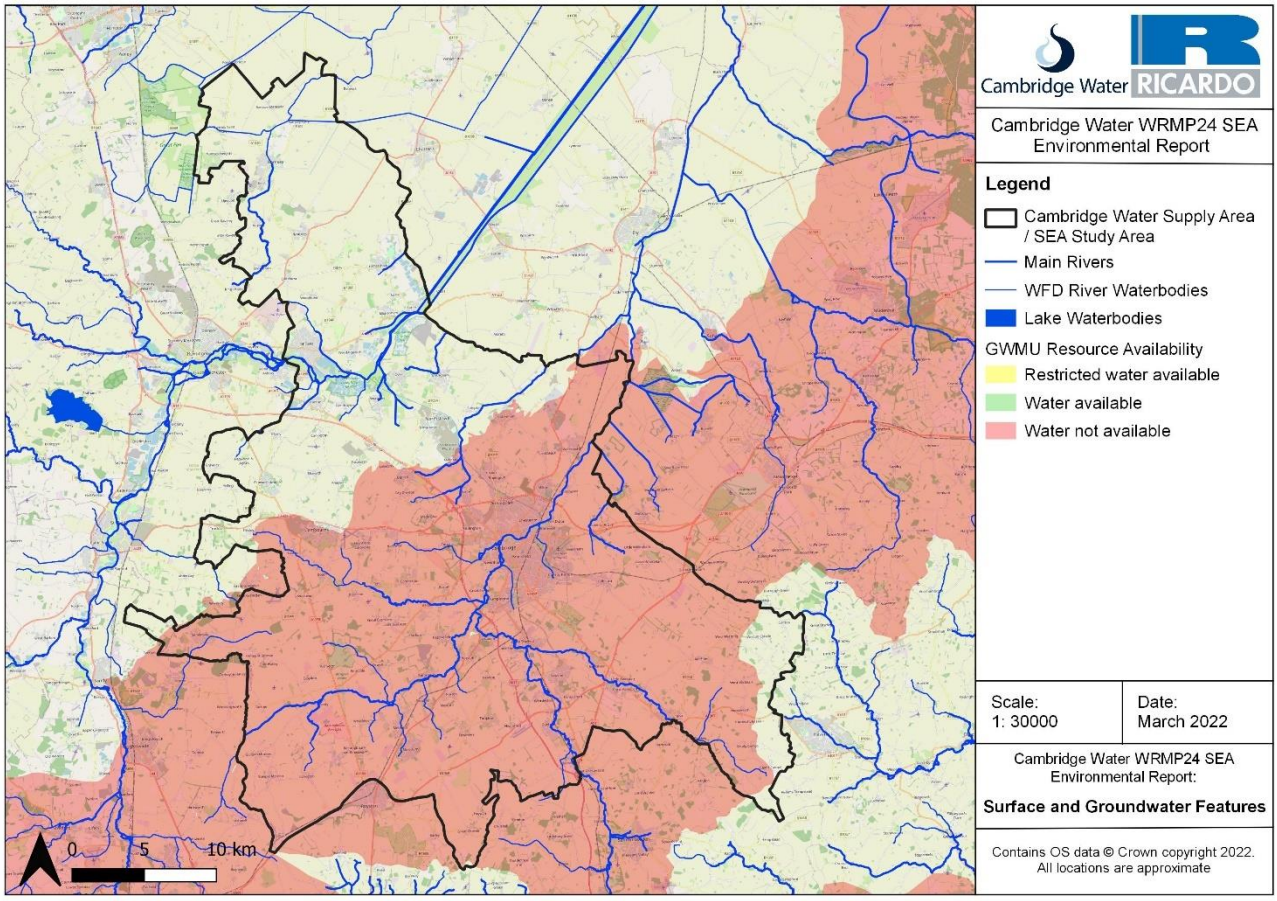
[52] Flood Risk Maps for Rivers and Sea in England - December 2019 (arcgis.com)

[53] Environment Agency (2009) Flooding in England: A National Assessment of Flood Risk

[54] Environment Agency (2021) Anglian River Basin District Flood Risk Management Plan 2021-2027 Anglian River Basin District Draft Flood Risk Management Plan 2021 to 2027 (environment-agency.gov.uk)

[55] Environment Agency (2016) Anglian river basin district: River basin management plan Anglian_RBD_Part_1_river_basin_management_plan.pdf (publishing.service.gov.uk)

Figure D.5 Surface and Groundwater Features



Likely Evolution of the Baseline without the WRMP

A national framework for water resources[56] highlights that if no action is taken between 2025 and 2050, around 3,435 million extra litres of water per day will be needed to address future pressures across England. Five regional groups have been set up each tasked with pulling together a regional plan to build resilience to a range of uncertainties and future scenarios. These include water companies and other water users. Cambridge Water is a member of the east's regional group, Water Resources East (WRE), where there is significant pressure and little surplus water available. An estimated 570Ml/d will be needed to meet public water resource needs in the east, this is equivalent to all the supply options featured across the respective water company WRMPs across WRE. Consumptive water use outside of public water supply is greatest in the WRE region compared to the other four regional groups, with an estimated demand of 444 Ml/d with 64% of this is for agriculture (spray irrigation). The focus of WRE will be on reducing demand for water across all water users and increasing the amount of water available through exploration of new supply options.

Originally, the WFD set a target of aiming to achieve at least 'good status' in all water bodies by 2015. However, provided that certain conditions are satisfied, it was acknowledged that in some cases the achievement of good status may be delayed until 2027.

The NPPF states that inappropriate development in areas at risk of flooding (in Flood Zone 1, Flood Zone 2, Flood Zone 3a or Flood Zone 3b - the functional floodplain) should be avoided by directing development away from areas at highest risk. The NPPF requires that where development is necessary, it should be made safe for its lifetime without increasing flood risk elsewhere. The NPPF requires the application of a sequential, risk-based approach (operated through Strategic Flood Risk Assessment) to the location of development to avoid where possible flood risk to people and property and to manage any residual risk, taking account of the impacts of climate change. Following application of the Sequential Test, if it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the

[56] Environment Agency (2020) Meeting our future water needs: a national framework for water resources. March 2020

Exception Test can be applied if appropriate. This includes development for water-compatible uses (e.g. water transmission infrastructure and pumping stations) and essential infrastructure (e.g. water treatment works that need to remain operational in times of flood).

The UK Climate Change Risk Assessment (CCRA3) 2021 Evidence Report[57] fulfils the requirement of the Climate Change Act 2008 for the government to lay before Parliament a five-yearly assessment of the risks for the UK of current and predicted impacts of climate change. The most recent findings of all CCRA assessments on the water environment include:

- Changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology (including water scarcity, flooding and saline intrusion)
- Increasing pressure on the UK's water resources due to changes in hydrological conditions and regulatory requirements to maintain good ecological status
- Increases in water demand for irrigation of crops
- A reduction in public water supplies due to increasing periods of water scarcity
- Lower summer river flows across the UK due to warming and drying conditions
- An increase in precipitation in winter months due to a combination of greater depths and more frequent heavy rainfall events – suggesting larger volumes of runoff with potential negative impacts on flood risk and sewer overflows in urban environments
- Flash-flooding associated releases from combined sewer overflows (CSO) could in turn increase associated illnesses at the coast due to the varying occurrence of microbial pathogens in the marine environment.

Key Issues Relevant to the WRMP

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

- The need to further improve the quality of the regions' river and estuarine waters taking into account WFD objectives.
- The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives.
- 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 water and groundwater.
- The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply.
- The need to reduce and manage flood risk.
- The need to ensure that people understand the value of water.

AIR QUALITY AND CLIMATIC FACTORS

Baseline Characteristics

The schemes in the WRMP may involve construction, operation of abstraction and treatment operations in new locations and changes to the operation of such processes in existing locations. Therefore, there is the potential for adverse effects on air quality and climate through emissions associated with construction (on site and transport) or through the operation of the schemes.

[57] HM Government (2022) UK Climate Change Risk Assessment 2022. January 2022

Local Air Quality

Options in the WRMP may require construction of new infrastructure or increased pumping of water. Therefore, there is the potential for adverse effects on local air quality through emissions associated with construction (on site and from transport) although generally only in the short term.

The local air quality baseline situation can be described through reference to the number of designated Air Quality Management Areas (AQMA). A local authority declares an AQMA when UK National air quality objectives are unlikely to be met. The majority of the AQMAs in the UK have been declared because of emissions from road transport. There are three AQMAs within the assessment area (as shown in **Figure D.6**).

The most recent Clean Air Strategy contains a set of objectives focused on the reduction of traffic emission impacts[58]. In April 2015, the Supreme Court ruled that the UK Government must redraft the national nitrogen dioxide (NO_2) air quality action plan, as well as 16 regional action plans, including Greater London, with the aim of ensuring that these areas reach compliance with legal NO_2 limits as soon as possible. In response, the Government published an updated plan in 2017 along with individual zone plans for the 37 zones identified as having air quality issues with NO_2, including the Eastern region[59]. Air quality compliance data is further detailed in the Defra report: Air Pollution in the UK 2020.[60]

In recent years, several key air pollutants have shown major decreases in atmospheric concentrations across the UK, while others have remained constant[61]:

- Atmospheric concentrations of SO_2 have continued to decrease, in line with long-term trends across the UK. These reductions are a result of decreasing dependence on coal for energy and reductions in the sulphur content of fuels.
- Overall emissions of NO_x have decreased over the last 20 years, falling 57% between 2009 and 2019. Emissions from road transport also decreased by 31% between 2009 and 2019 as a result of tighter emissions standards for petrol and diesel cars. The monitored atmospheric concentrations did not show such a notable decrease, potentially due to continued high levels of NO_x emissions from older vehicles.
- Atmospheric concentrations of particulate matter ($PM_{2.5}$ and PM_{10}) decreases in emissions have been partially offset by increases in emissions from residential burning with $PM_{2.5}$ emissions increasing by 28% between 2009 and 2019.
- Carbon monoxide (CO) concentrations were reduced as a result of reductions in emissions from road transport, iron and steel production and the domestic sector.
- Levels of ozone have remained relatively constant since the mid-1990s, with a possible increase observed within significant annual variation as a consequence of primary NO emission reductions. The distribution of ozone across the UK shows highest concentrations over upland and rural locations with annual average concentrations of >60µg m^{-3} over rural areas in the UK.
- Tentative observations show that increases in average ozone may be generally larger at rural (and urban) sites in the eastern part of the UK than in the western part, probably reflects both the greater influence in the east from changes in emissions in continental Europe and the greater reductions in NOx levels in eastern areas where populations (and therefore emissions) are greater than in the west[62].

[58] Defra (2019) Clean Air Strategy 2019. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/cleanair-strategy-2019.pdf

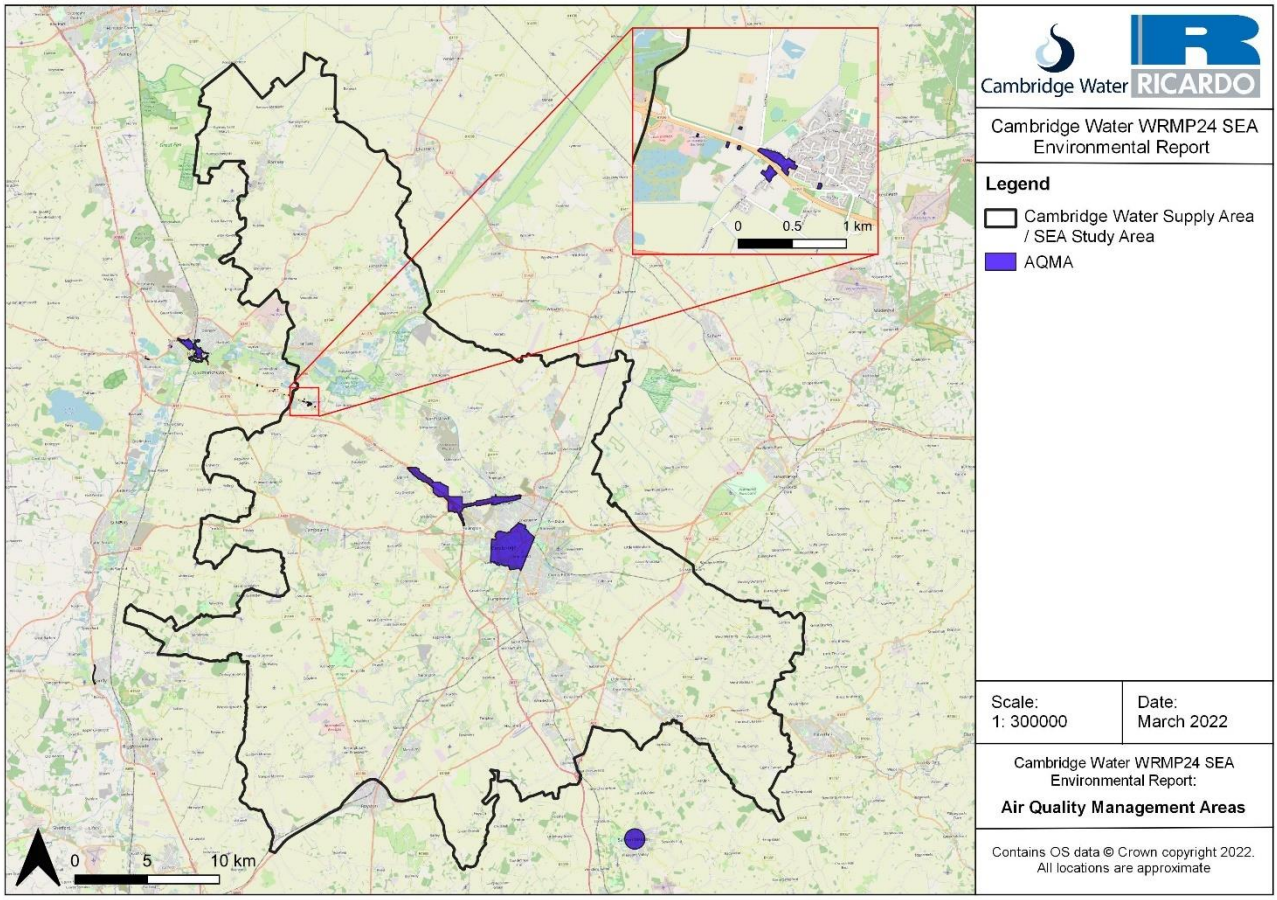
[59] AQplans_UK0029.pdf (defra.gov.uk)

[60] Annual Report 2020 Issue 1 Online Viewer - Defra, UK

[61] DEFRA (2021) Emissions of air pollutants in the UK – Summary. Emissions of air pollutants in the UK - Summary - GOV.UK (www.gov.uk)

[62] Air Quality Expert Group (2021) Ozone in the UK – recent trends and future projections. 2112200932_Ozone_in_the_UK_Recent_Trends_and_Future_Projections.pdf (defra.gov.uk)

Figure D.6 Air Quality Management Areas



Greenhouse Gases and Climate Change

Greenhouse gases including carbon dioxide (CO2) emitted from human actions are a major contributor to climate change. The East of England emitted approximately 9.9% of the UK's greenhouse gas emissions in 2019[63]. The amount of CO2 emitted in the East of England sub-region between 2015 and 2019 is shown in **Table D-5** and highlights that total emissions have reduced since 2015 by 13.2% to 27.7 MtCO2 in 2019, principally because of declines in emissions from the industry and commercial, domestic and public sectors. Domestic and transport sectors remained the largest source of CO2 emissions in the region.

Table D-5 End User Estimates of Carbon Emissions, East of England 2015-2019[64]

End User	2015	2016	2017	2018	2019
Industry ($MtCO_2$)	5.5	4.8	4.8	4.9	4.5
Commercial ($MtCO_2$)	3.8	3.1	3.0	3.0	2.7
Public sector ($MtCO_2$)	1.4	1.3	1.0	1.0	0.9
Domestic ($MtCO_2$)	10.1	9.6	9.0	9.0	8.7
Transport ($MtCO_2$)	10.7	11.0	11.3	11.1	10.8
LULUCF[65] Net Emissions	0.3	0.3	0.3	0.3	0.3

[63] BEIS (2021) UK Local authority carbon dioxide emissions estimates 2019. UK local authority carbon dioxide emissions estimates 2019 (publishing.service.gov.uk)

[64] BEIS (2021) UK Local authority and regional carbon dioxide emissions national statistics: 2005 to 2019. UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2019 - GOV.UK (www.gov.uk)

[65] Land Use, Land-Use change and Forestry

End User	2015	2016	2017	2018	2019
Total	**31.6**	**29.9**	**29.1**	**29.0**	**27.7**
Per capita emissions (t)	*5.2*	*4.9*	*4.7*	*4.7*	*4.4*

Of the three local authority (LA) areas within SEA study area, every LA experienced a reduction in per capita emissions between 2014 and 2019[66]. Cambridge had the highest percentage decrease in emissions with 24.8%, followed by Huntingdonshire with 15.7% and South Cambridgeshire with 11.1%.

The predominant greenhouse gas of interest is carbon dioxide (CO_2). Cambridge Water's greenhouse gas emissions, reported as tonnes of CO_2 equivalent per Ml of treated water (CO2e/Ml), were 309 kgCO2e/Ml in 2020/2021[67] (figure also incorporates South Staffordshire Water).

The latest UK Climate Projections (UKCP18[68]) estimate that summers in the East of England will be hotter and drier and the winters warmer and wetter. **Table D-6** presents the key findings of the UKCP18 projections for the East of England and England. Overall, figures for the East of England are comparable with the rest of the country, however, the region is forecasted to be slightly wetter, drier and warmer than the average for England.

Table D-6 Key findings of UKCP18 projections, using high emission scenario, median values (50th percentile)

Date Range	2010-29		2040-59		2080-99	
Variable	East of England	England	East of England	England	East of England	England
Mean annual temperature change (°C)	+0.8	+0.8	+1.8	+1.8	+4.1	+4.1
Mean summer precipitation (% change)	-6	-5	-19	-19	-37	-35
Mean summer temperature change (°C)	+1.1	+1.1	+2.3	+2.3	+5.3	+5.3
Mean winter precipitation (% change)	+5	+5	+9	+9	+22	+21
Mean winter temperature change (°C)	+0.7	+0.7	+1.7	+1.6	+3.6	+3.5

Future climate change is likely to influence processes within the hydrological cycle such as runoff and evapotranspiration. The potential impact of climate change on Cambridge Water's WRMP water supply and demand management schemes is summarised in **Table D-7**.

Table D-7 Potential Impact of Climate Change on Water Resources and Demand Management Schemes

Sector	Impact
Water Resources **(i) Water Supply**	Reduction in water source yield, either in total or at certain times of the year. Increased evaporation losses from surface water stores. Increased sediment and pollution runoff into watercourses caused by changes in farm management practices adopted to adapt to climate change.

[66] BEIS (2021) UK Local authority and regional carbon dioxide emissions national statistics: 2005 to 2019. UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2019 - GOV.UK (www.gov.uk)

[67] http://www.discoverwater.co.uk/energy-emissions

[68] https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index

Sector	Impact
	Increased risk of algal blooms and pollution in reservoirs.
(ii) Water Demand	Increase in demands in summer months leading to increase in average and peak requirements. Increased pressure on treatment and distribution system.
Flood Management	Increased riverine flood risk and storm occurrence due to increased rainfall, leading to reduction in safety standards. Improvements and higher specifications required for flood defences, urban drainage and rainwater disposal.
Water Quality Management	Lowered water quality in lowland rivers, with implications for in-stream ecosystems and water abstractions. Altered potential for polluting incidents. Increased potential for combined sewer overflows.
Navigation	Lower summer flows leading to reduced navigation opportunities in rivers and canals.
Aquatic Ecosystems	Altered habitat potential, with species at their environmental margins most affected.
Water-Based Recreation	Impacts through changes in river flows and water quality.

Adaption to Climate Change

The UK Climate Change Risk Assessment (CCRA3) 2021 Evidence Report, which is required to conduct its assessment every five years,[69] draws together and interprets evidence gathered by CCRA regarding current and future threats and opportunities for the UK posed by the impacts of climate change up until 2100. Overall, the findings of the CCRA3 have identified eight priority areas for Government and other organisations to address within the next five years:

- Risks to the viability and diversity of terrestrial and freshwater habitats and species from multiple hazards
- Risks to soil health from increased flooding and drought
- Risks to natural carbon stores and sequestration from multiple hazards leading to increased emissions
- Risks to crops, livestock and commercial trees from multiple hazards
- Risks to supply of food, goods and vital services due to climate-related collapse of supply chains and distribution networks
- Risks to people and the economy from climate-related failure of the power system
- Risks to human health, well-being and productivity from increased exposure to heat in homes and other buildings
- Multiple risks to the UK from climate change impacts overseas.

The UK Climate Change Act 2008 set legally binding targets for the UK to reduce greenhouse gas emissions by at least 80% by 2050, and CO_2 emissions by at least 26% by 2020, both set against a 1990 baseline. Under the requirements of the Act, the Government has set five year carbon budgets to set out a trajectory for emissions reductions to 2050. Budgets have been set covering the periods 2008-12, 2013-17, 2018-22, 2023-27 and 2028-32, equivalent to 22%, 28%, 34%, 50% and 57% reductions in carbon emissions compared to 1990 levels respectively. The National Adaptation Programme (NAP) is currently in its second period [2018-2023] which sets out the actions that government and others will take to adapt to climate change challenges in England. The NAP addresses climate risks which could affect the natural environment, critical infrastructure, communities and businesses and consequently explains associated actions and future responses on risks such as flooding and coastal change, risks to health from high temperatures, and risk of public water supply shortages[70].

Likely Evolution of the Baseline without the WRMP

Government and international targets will require significant cuts in greenhouse gas emissions by 2027. The UK met the first and second carbon budgets with headrooms of 36 and 384 $MtCO_2e$ respectively and is currently projected to meet the third carbon budget with a headroom of around 26 $MtCO_2e$ (until 2022)[71]. Objectives are being achieved for many air pollutants (lead, benzene, 1,3-butadiene and carbon monoxide (CO)). However, measurements show that long-term reducing trends for NO_2[72] and PM_{10}[73] are flattening or even reversing at a number of locations, despite current policy measures.

Future climate change is projected (UKCP18) to cause a change in the seasonality of extremes through an extension of the convective season from summer to autumn, with increases in heavy rainfall intensity in the autumn. Although an overall summer drying trend is to be expected in the future, data from the Met Office's UK Climate Projections (UKCP18 [Local 2.2km] projections) suggest increases in heavy summer rainfall event

[69] Defra (2021) The UK Climate Change Risk Assessment 2021 Evidence Report. https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf

[70] DEFRA (2018) The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting. national-adaptation-programme-2018.pdf (publishing.service.gov.uk)

[71] DECC (2020) Updated energy and emissions projections 2019. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/931323/updated-energy-and-emissions-projections-2019.pdf

[72] Nitrogen dioxide

[73] Particulates with a diameter of 10µm or less

intensity[74]. The UKCP18 also estimates that summers in central England are likely to be between 1.1°C to 5.8°C warmer,57% drier and 9% wetter[75].

Emissions of PM_{10} and $PM_{2.5}$ have been relatively stable since 2009. The Government's aim is to reduce emissions of $PM_{2.5}$ against the 2005 baseline by 30% by 2020, and 46% by 2030, emissions of NO2 against the 2005 baseline by 55% by 2020 and 73% by 2020 and to reduce emissions of sulphur dioxide against the 2005 baseline by 59% by 2020, increasing to 88% by 2030[76].

Key Issues Relevant to the WRMP

The key sustainability issues relevant to the WRMP and the SEA, arising from the analysis of the air quality and climate baseline are:

- The need to minimise emissions of pollutant gases and particulates and enhance air quality;
- 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.

[74] Met Office (2021) UK Climate Projections: Headline Findings

[75] Defra, BEIS, the Met Office and the Environment Agency (2018) – UKCP18 Climate Change Over Land: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-infographicheadline-findings-land.pdf

[76] Defra (2019), Clean Air Strategy 2019

POPULATION AND HUMAN HEALTH

Baseline Characteristics

Population

The assessment area is wholly within the East of England region, which is the second largest English region by area, behind only the South West; where large expanses of arable land are characteristic of the region. The east of England population is projected to increase by 15% by 2043, based on the 2020 estimated figure of 6.3 million. Cambridgeshire Research Group produces population and dwelling stock forecasts for Cambridgeshire and its districts. It is estimated that between 2021 and 2036, the population of Cambridgeshire will rise by 16%, from 685,770 to 794,200[77].

Population change is the function of natural change (difference between births and deaths) and net migration (the difference between the number of people moving into and out of an area). The balance of factors underlying population change varies by region. To provide context, the population in England as a whole is expected to increase by 9% by 2043. **Table D-8** shows the population and household statistics and projections for the regions that fall within, and surround, the assessment area.

Table D-8 Population[78],[79] and Household[80] estimates and projections (millions)

Region	2020 estimates		2043 projections		% change 2020-2043	
	Population	No. Households	Population	No. Households	Population	No. Households
East Midlands	4.9	2.0	5.5	2.4	12	20
East of England	6.3	2.6	6.8	3.0	8	15
South East of England	9.2	3.8	9.9	4.3	8	13
England	56.6	23.5	61.7	27.0	9	15

The long-term issues relating to population growth and associated requirement for housing and water (and wastewater) infrastructure provision represent key issues for the strategies required within the long-term planning horizon of the WRMP. However, the UK's exit from the European Union (EU) may possibly lead to greater uncertainty regarding future population and housing growth.

Human Health and Deprivation

The WRMP has the potential to influence quality of life, including human health, wellbeing, amenity and community, through actions to maintain essential water supplies for public use. There could be beneficial (such as actions to provide additional supply of water will help safeguard public health) or adverse impacts (such as noise and disruption from the construction of infrastructure).

In general, the health of the population in the assessment area is good. The East of England region experiences higher than average life expectancy at birth for both males (80.2 years compared with 79.4 for England) and females (83.8 years compared with 83.1 for England), for the period 2018 to 2020[81].

It has been shown that, in some cases, people in disadvantaged areas experience greater exposure to negative impacts on human health including air pollution, flooding and proximity to large industrial and waste management sites[82]. The Index of Multiple Deprivation combines a number of indicators, chosen to cover a range of economic, social and housing issues, into a single deprivation score for each Lower Super Output Area in the UK. This allows each area to be ranked relative to one another according to their level of deprivation. The Indices are used widely to analyse patterns of deprivation, identify areas that would benefit

[77] Cambridgeshire Insight (2020) Cambridgeshire and Peterborough 2018-based district population forecasts
[78] ONS (2020) Mid-Year Population Estimates, UK, June 2020
[79] ONS (2020) Subnational population projections for England: 2018-based
[80] ONS (2020) 2018-based household projections for local authorities and higher administrative areas within England (principal projection)
[81] ONS (2021) Life expectancy for local areas of the UK: between 2001 to 2003 and 2018 to 2020.
[82] Defra (2006) Air Quality and Social Deprivation in the UK: an environmental inequalities analysis

from special initiatives or programmes and as a tool to determine eligibility for specific funding streams. **Figure D.7** shows the Index of Multiple Deprivation across the assessment area.

In contrast with the rest of the UK, Cambridge and other towns and villages in the assessment area do not contain areas with high levels of deprivation. Data relating to drinking water quality, pollution incidents and air quality, which may have indirect effects on amenity and human health are covered in separate sections of this report.

Affordability of Water

An independent review of water affordability was undertaken by the Consumer Council for Water (CCW) in 2021[83]. This found that roughly 1.5 million households spend more than 5% of their income (after housing costs) on water bills, whilst 4.1 million spend more than 3%. As a result, a number of recommendations were made ranging from immediate, short-term (12 months), medium term (within three years and long term (within three to six years) actions, along with the who the responsibility lies with to make each one a reality.

It should be noted that Cambridge Water already has one of the lowest average household water and sewerage bills in England.

Water metering can help customers reduce their bills through improved water use efficiency. However, there are concerns that metering can disadvantage vulnerable and low-income groups. Cambridge Water's current strategy is to continue offering unmetered customers the option to swap to a water meter free of charge as well as metering all new household properties.

Recreation and Tourism

WRMP options have the potential to affect areas with recreation value. Effects could arise as a result of scheme operation (for example on river water levels), or due to scheme construction (for example due to restricted access).

Tourism contributes around 9% of the UK's GDP (approximately £127 billion a year) and accounts for 10% of the UK job market[84]. In 2019, over 9 million UK domestic overnight trips were made to the East of England, accounting for 10% of overnight trips in England and generating a total spend of £1.7 billion[85]. Cambridge is the largest city in the assessment area and, in 2019, over 8 million people visited the area, contributing over £850 million to the local economy[86]. The tourism industry was one of the hardest hit sectors by the COVID-19 pandemic.

Some of the areas that may be used for recreation within the assessment area are shown **Figure D.1**. These include National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) (see Biodiversity, Flora and Fauna topic).

There are a variety of opportunities for recreation and tourism within assessment area. Many of the recreational and cultural offerings are represented in other topic areas in the baseline. For example, the Cambridge Water supply area includes a number of water resources of recreation importance including canals, reservoirs and lakes (i.e. Moor lake, Drayton Lagoon, Far fen Lake, Trout Pool) for sailing or fishing and river reaches (i.e. River Greater Ouse, St. Ives Chub Stream) of particular importance with respect to navigation and angling – both coarse and salmonid).

Other, non-water based, recreational and cultural resources in the assessment area include a number of nature reserves presented in the Biodiversity Flora and Fauna section of Appendix D. The Cultural Heritage Section of Appendix D identifies the importance of the assessment area with respect to heritage assets, including 26 Registered Parks and Gardens and 128 Scheduled Monuments.

Public areas of open space, National Parks (see Landscape topic), country parks, Public Rights of Way, walking routes and cycle routes are also important with respect to recreation and tourism. The National Planning Policy Framework (NPPF) for England states planning policies should protect and enhance public rights of way and access[87]. All Local Authorities are required to prepare and publish Rights of Way

[83] CCW (2021) Independent Review of Water Affordability

[84] British Tourist Authority (2021) Visit Britain & Visit England Annual Report and Accounts – Year Ended 31 March 2021.

[85] Visit Britain (2020) England – All Trip Purposes 2019. england_all_trip_purposes_2019.pdf (visitbritain.org)

[86] Cambridge City Council (2019) East of England Tourism's Volume and Value Study

[87] MHCLG (2021) National Planning Policy Framework. https://www.gov.uk/government/publications/national-planning-policy-framework--2

Improvement Plans (ROWIPs). These plans explain how improvements made by local authorities to the public rights of way network will provide a better experience for a range of users, including pedestrians and cyclists.

The NPPF defines green infrastructure as 'a network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of delivering a wide range of environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity'. Local planning authorities are required to plan positively for strategic networks of green infrastructure and take account of the benefits of green infrastructure in reducing the risks posed by climate change. The majority of Local Authorities have therefore developed Green Infrastructure strategies or studies addressing these issues. Green infrastructure will often play a large part in local recreational resources.

Economy and Employment

The Cambridge Water service area has a varied economy that is centred around the city of Cambridge. In 2017, a combined authority was established connecting Cambridgeshire with Peterborough, which lies to the north just outside of the Cambridge Water supply area.

Within the Cambridgeshire area (which contains the majority of the Cambridge Water customer population) 78.4% of the population between 16 and 64 are employed, compared to 74.5% in the United Kingdom. Of the 101,000 individuals who are not employed, 31,100 (30%) are full-time students[88]. The largest industries by workforce numbers in the East of England are Wholesale and Retail Trade (468,000 people) Human Health and Social Work (418,000 people) and Administrative and Support Services (325,000 people)[89].

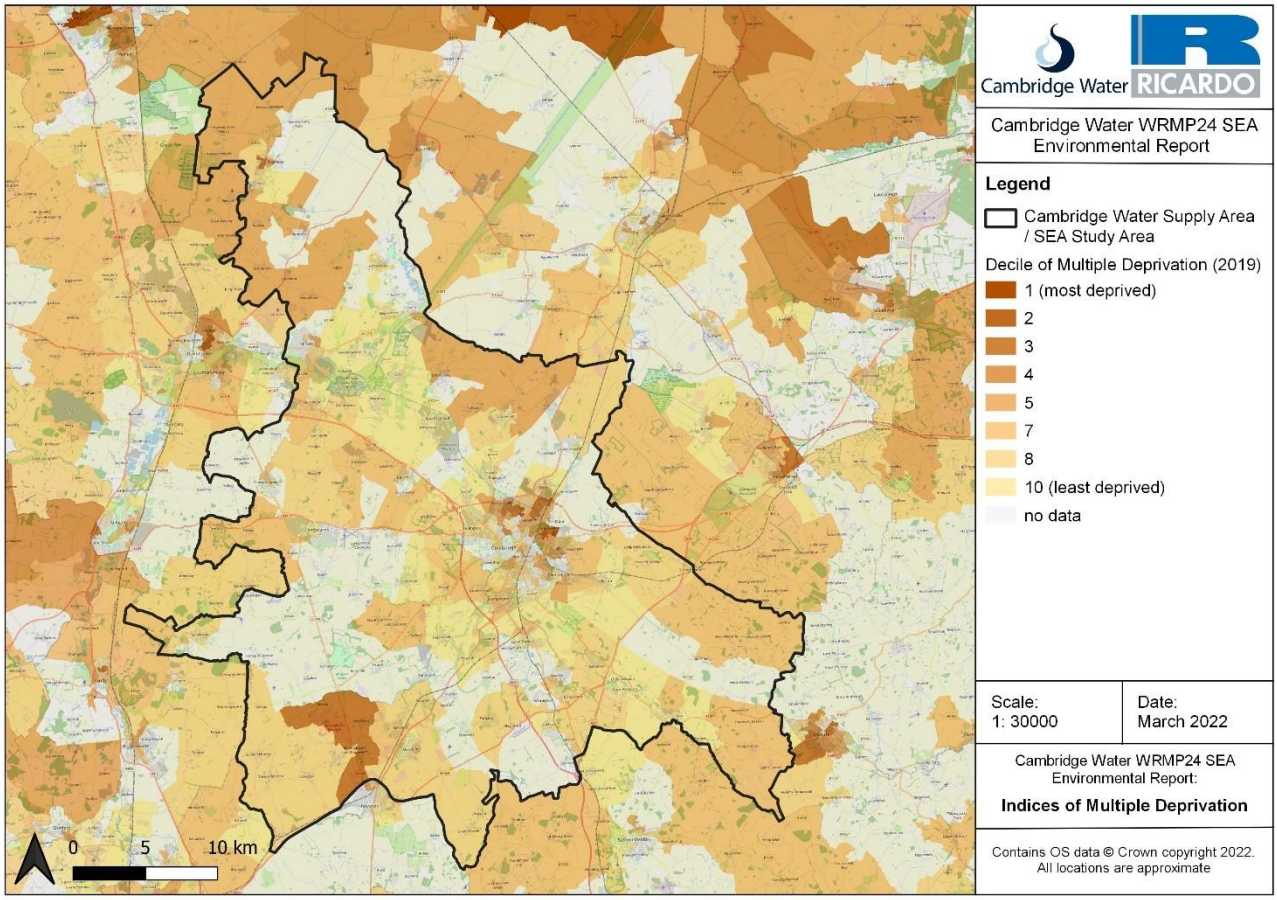
The East of England had a Gross Domestic Product (GDP) of £190 billion in 2019, or £30,622 per worker[90]. Cambridgeshire and Peterborough had a combined Gross Value Added (GVA) per head of £30,840.

[88] Cambridgeshire Insight (2022) https://cambridgeshireinsight.org.uk/

[89] ONS (2022) Regional labour market statistics: HI06 Headline indicators for the East of England.

[90] ONS (2021) Regional economic activity by gross domestic product, UK: 1998 to 2019

Figure D.7 Index of Multiple Deprivation



Likely Evolution of the Baseline without the WRMP

As shown in **Table D-8**, the population in the East of England is expected to increase by 15% to 2043, with an increasing proportion of people at or above state pension age. Household projections show potential increases of approximately 15% across the region. However, the UK's exit from the EU may pose greater uncertainty in the short term regarding future population and housing growth.

Average yearly household water and sewerage bills are expected to rise by 1.7% in 2022, however the actual increase varies by geographic location. 1 million households are receiving help with their water bills, a figure which is expected to rise to at least 1.4 million by 2025. As a result of the 'Independent review of water affordability' commissioned by the UK and Welsh governments and published by CCW, more pressure has been put on water companies to provide support for customers struggling to pay.

Cambridge Water charges up to 25% less than the average amount charged for water across England and Wales. The company has special tariffs (Assure, Assure Assist and WaterSure) aimed at people on low incomes who are struggling to pay their water and wastewater bills. Cambridge Water also offer payment breaks to provide short-tern financial relief to their customers.

The NPPF highlights the importance of protecting and enhancing areas used for recreational, social and cultural purposes in future planning policies in order to promote healthy and safe communities. The Environment Plan further emphasises the need to consider an 'environmental net gain' principle in future development, building on the approaches used for biodiversity and expanding to include wider natural capital benefits such as recreation and improved water and air quality. One of the actions promoted in the plan is to produce stronger new standards for green infrastructure which will promote health and wellbeing and social interaction amongst communities.

Improvements to the quality of the water environment and certain potential climate change impacts will present opportunities for an expanding tourist industry in the region[91].

Key Issues Relevant to the WRMP

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

- The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water and sewerage services 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 ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population.
- The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment.
- The need to accommodate an increasing population.
- 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 well-being and the economy.

MATERIAL ASSETS AND RESOURCE USE

Baseline Characteristics

Water Use

Cambridge Water abstracts from groundwater sources and typically supply an average of 83 million litres of water per day (Ml/d) to its customers. Cambridge Water has a number of small cross-border metered supplies with Anglian Water and Affinity Water, both into and out of the company's area. These serve a small numbers of properties only, and are not the subject of formal agreement.

Cambridge Water has ongoing programmes to reduce leakage from its network and to encourage more efficient use of water by customers. Leakage levels from the water distribution system reported by Cambridge Water for 2018/19 was 13.2 Ml/d. 0.3 Ml/d lower than the proposed target of 13.5 Ml/d. Furthermore, a 4.1% reduction in leakage was reported for the period 2020/21 (based on a three-year rolling average). Water consumption per person, also referred to as per capita consumption (PCC), is slightly lower in the Cambridge Water supply area compared to other parts of the country, with an average use per person estimated at around 140 litres/day compared to a national average in England of around 145 litres/day[92][93]. Cambridge Water propose to reduce average PCC to 137 litres/day by 2025.

The 2020/21 period experienced a 3% increase in household water use (per capita consumption) in the Cambridge Water region, attributed to the unprecedented impact of the COVID-19 pandemic which had significant impacts on household water use patterns. Ofwat, the regulator, has agreed to review the water use targets for water companies at its next review to enable companies to better understand the impacts of the pandemic on water efficiency.

Resource Use and Waste

Cambridge Water is a large user of energy due to the energy needed to treat and pump water. 98% of all Cambridge Water's electricity usage is used for pumping water and also contributes 90% to all the company's carbon emissions. The aim of the water industry sector is to achieve net zero carbon emissions by 2030[94].

[91] UK Climate Change Risk Assessment 2022 (publishing.service.gov.uk).
[92] Water UK; England and Wales, three year average (April 2018 – March 2021)
[93] https://discoverwater.co.uk/amount-we-use
[94] Water UK – Net Zero 2030 Routemap

Cambridge Water undertake a Pumping Efficiency Programme (PEP) which allows effective planning of maintenance and replacement of pumps, with newer and more efficient technology, balancing the costs of the replacement against electricity.

The East of England is a relatively high producer and consumer of energy. Total energy consumption in the region was 134.4 terawatt hours in 2017 (Total All Fuels), about 9.1% of the total UK figure. This represents a decrease of 12% energy consumption over a 10-year period, from the 2007 total of 152.9 terawatt hours[95].

There is an ongoing need for society to reduce the amount of waste it generates, by using materials more efficiently, and improving the management of waste that is produced. In England, waste going to landfill has almost halved from 2010 to 2019 (20,298 thousand tonnes to 11,492 thousand tonnes) whilst recycling rates have increased from 41.2% to 45.5%[96]. The recycling rate in the Greater Cambridge area, which falls within the assessment area, was above that of England at 51% in 2019[97]. Waste generated by businesses, referred to commercial and industrial waste, increased by 16% between 2010 and 2019. In line with the widely adopted 'waste hierarchy', best practice for waste management is to reduce, re-use, recycle and recover, and only then should disposal (or storage) in landfill be considered.

Data on waste arisings are collected in a range of categories. The activities of the water industry contribute to construction, demolition and excavation waste (CDEW), through construction of new infrastructure. The water industry also contributes to several waste streams through the operation of its treatment facilities. Waste streams include commercial and industrial waste (statistics include waste arisings from the power and utilities sector, which includes water supply and sewage removal), and also hazardous wastes. **Table D-9** shows waste data according to economic activity in England in 2018 against 2014 data.

Table D-9 Waste Generation Split by Responsible Economic Activity in England

Sector	2014 ('000 tonnes)	Recycle Rate (%)	2018 ('000 tonnes)	Recycle Rate (%)
Commercial and Industrial	19,849	-	25,938	-
Construction	49,109	91.4	119,429	93.8
Household	22,355	44.8	22,033	44.8
Other (municipal waste)	13,714	-	886	-

Likely Evolution of the Baseline without the WRMP

The Government's national aspiration is to reduce water usage to an average of 110 litres per person per day by 2050[98]. Water companies across England and Wales are currently working towards this assumption.[99]

The Government, Ofwat and the Environment Agency expect that leakage will not rise in any water company area and leakage targets must be set that take account of customer priorities for reliable water supplies. Ofwat have set companies stretching leakage targets over the 2020-2025 period. Cambridge Water have an ambition to reduce leakage by 15%, through investment into the maintenance of pipes and associated assets as well as use of innovative methods such as satellite detection technology. According to the latest annual performance report, the company has met its leakage targets and are on track to deliver this target by 2025. Furthermore, water companies have committed to delivering a 50% reduction in leakage (based on 2017-18 levels) by 2050. This was a recommendation from the National Infrastructure Commission[100].

There is a potential for an increase in operational waste from the water sector as the regional population rises, more water is supplied to customers and standards of treatment are increased through regulatory requirements. For example, as well as wastage of water from leakage, types of operational waste from the

[95] DEIS (2019) *Sub-national total final energy consumption in the United Kingdom* (2005-2017). https://www.gov.uk/government/statistical-data-sets/total-final-energy-consumption-at-regional-and-local-authority-level

[96] Defra (2021) UK Statistics on Waste. July 2021.

[97] Cambridge City Council, Climate Change Strategy 2021-2026.

[98] Defra (2021) The government's strategic priorities for Ofwat. Draft for consultation. July 2021

[99] Environment Agency (2020) Meeting our future water needs: a national framework for water resources. March 2020.

[100] National Infrastructure Commission (2018) Preparing for a drier future. England's water infrastructure needs. April 2018.

water industry will include additional chemical use in water treatment works and waste from construction operations due to pipe network upgrades and extensions.

The Resources and Waste Strategy for England sets out the desire to extract the maximum value out of resources to achieve a more circular economy and forms a key part of the government's pledge to leave the environmental in a better condition than we inherited it. The government has set a target for at least 65% municipal waste to be recycled by 2035 and no more than 10% ending up in landfill.

The Government's National Infrastructure Strategy[101] (2020) outlines a legal commitment to decarbonise the economy by 2050, and strategies to rebuild the economy following the COVID-19 pandemic and plans to 'level-up' UK cities and regional powerhouses. The UK Government plans to accelerate the deployment of green technology through private sector investment in the retrofitting of existing stock, carbon capture and low-carbon hydrogen. Cambridge City Council is committed to decarbonising and aims to be net zero by 2030, subject to government, industry and regulators implementing the necessary changes to enable this.

Cambridge Water's Pumping Efficiency Programme (PEP) allows efficient planning of the maintenance and replacement of pumps, with newer, more efficient technology to balance the cost of the pump replacement against the cost of electricity. Cambridge Water are also installing solar panels at some of sites to reduce electricity taken from the electricity grid and further reduce emissions, and are committed to the industry net zero targets, including migration to EV within its fleet.

Key Issues Relevant to the WRMP

The key sustainability issues arising from the baseline assessment for Material Assets and Resource Use are:

- The need to minimise the consumption of resources, including water and energy.
- The need to reduce the total amount of waste (from all sources) produced in the region, promote recycling and reduce the proportion of waste sent to landfill
- The need to recognise waste as a potential resource and reuse waste productively where possible to support development of the circular economy.
- The need to continue to reduce leakage from the water supply system
- Promote the efficient use of water to help reduce future demand for water.
- The need to support regional and national commitments to decarbonisation.

CULTURAL HERITAGE

Baseline Characteristics

Options in the WRMP could affect historic landscape character and historic structures associated with the water environment and the historical context of their setting. Archaeological remains are sensitive to changes in water quality, water levels (for example, waterlogged deposits), pollution and land use practices.

The NPPF[102] defines the historic environment as:

'*All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.*'

Table D-10 lists the designated heritage asset count, nationally and for the assessment area. Heritage assets are also shown on **Figure D.** 8.

[101] HM Treasury Infrastructure UK (2020). National Infrastructure Strategy https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938539/NIS_Report_Web_Accessible.pdf

[102] Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework

Table D-10 Designated Heritage Assets[103]

Asset	England	SEA Assessment Area
World Heritage Sites	20	None
Scheduled Monuments	19,923	128
Listed Buildings	379,126	4,092
Registered Historic Parks and Gardens	1,696	26
Registered Historic Battlefields	47	None
Protected Historic Wrecks	54	None

The National Character Areas (NCAs) described the Soils, Land use and Geology section of Appendix D include consideration of historic and cultural influences on the landscape. The key historic and cultural characteristics of each NCA are included in **Table D-11** below. Relevant NCA boundaries are shown in **Figure D.3**.

Table D-11 Landscape Character Areas: Historic and Cultural Characteristics

Area (Shown in Figure D.3)	Characteristics
The Fens	The area is very rich in geodiversity and archaeology, with sediments containing evidence for past environmental and climate changes and with high potential for well-preserved waterlogged site remains at the fen edge, within some of the infilled palaeo-rivers and beneath the peat. The Great Fen project aims to maintain and restore these wetlands. The potential impact on this project is a consideration in the assessment.
South Suffolk and North Essex Clayland	Roman sites, medieval monasteries and castles and ancient woodlands contribute to a rich archaeology. Impressive churches, large barns, substantial country house estates and Second World War airfields dot the landscape, forming historical resources.
East Anglian Chalk	Archaeological features include Neolithic long barrows and bronze-age tumuli lining the route of the prehistoric Icknield Way; iron-age hill forts, including that at Wandlebury; impressive Roman burial monuments and cemeteries such as the Bartlow Hills; a distinctive communication network linking the rural Roman landscape to settlements and small towns, such as Great Chesterford; the four parallel Cambridgeshire dykes that cross the Chalk: the Anglo-Saxon linear earthworks of Devil's Dyke, Fleam Dyke, Heydon/Bran Ditch and Brent Ditch; ridge-and-furrow cultivation remains of the open field systems of the earlier medieval period; and large numbers of later moated enclosures, park lands created, sheepwalks, arterial routes and nucleated villages that emphasise the land use change of this period.
Bedfordshire and Cambridgeshire Claylands	Rich geological and archaeological history evident in fossils, medieval earthworks, deserted villages and Roman roads. A number of historic parklands, designed landscapes and country houses – including Stowe House and Park, Kimbolton Park, Croxton Park, Wimpole Hall and Wrest Park – combine with Bletchley Park, Second World War airfields, the

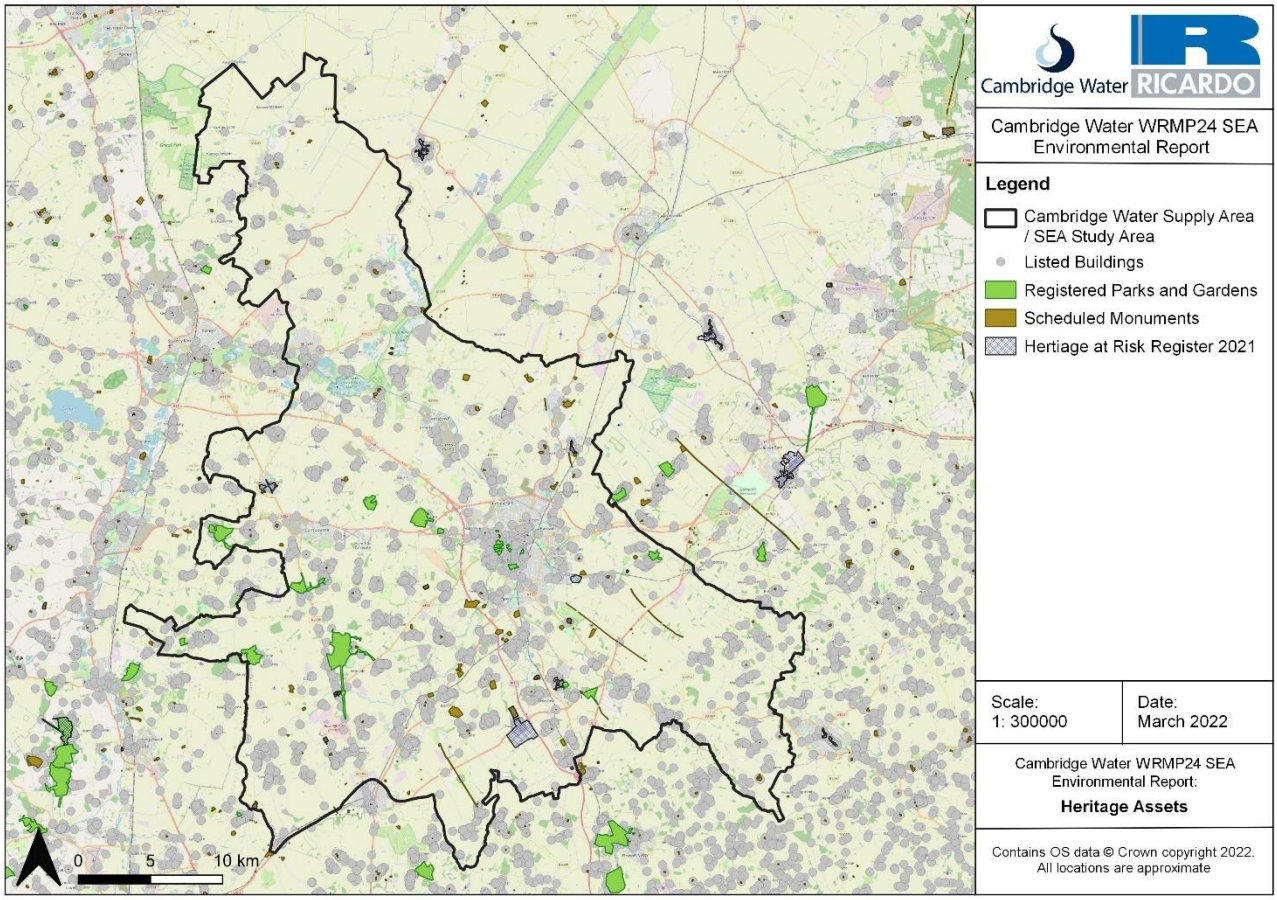
[103] Historic England: Heritage Counts 2021 (designated assets in study area were identified from GIS datasets available from Historic England at https://historicengland.org.uk/listing/the-list/data-downloads/)

Area (Shown in Figure D.3)	Characteristics
	Cardington Airship Hangars and brickfields to provide a strong sense of history and place.
Bedfordshire Greensand Ridge	Visible heritage of iron-age banks and ditches at Kings Wood and Glebe Meadows, Houghton Conquest Site of Special Scientific Interest (SSSI) and iron-age hill fort remains at Sandy. Remnant ridge and furrow at Hockliffe and Potsgrove. Historic parklands and estates associated with grand country houses such as Woburn.

Historic England has been collecting data on buildings at risk for more than a decade. The Heritage at Risk (HAR) Register systematically checks the condition of problem sites, initially focused on buildings at risk, but now adapted to serve other types of heritage asset. An Annual Register is published which identifies sites most at risk of being lost as a result of neglect, decay or inappropriate development. The HAR programme helps understanding of the overall state of historic sites in England identify those most at risk and most in need of safeguarding for the future. In 2021, there were 4,985 entries on the Register including 3.4% of all grade I and grade II listed buildings (excluding places of worship) along with 10% of all scheduled monuments in England. There are 28 historic sites on the 2021 HAR Register in the assessment area, the locations of these are illustrated on **Figure D.** 8. They include nine listed buildings, five conservation areas and 14 scheduled monuments.

Scheduled Monuments are at risk from water abstraction or dewatering. However, other assets including unknown assets such as those composed of organic material and preserved in waterlogged or anaerobic conditions are proportionately more at risk (e.g. palaeo- environmental deposits). The waterlogged conditions that preserve these remains may be rain-fed or groundwater fed. If the latter, then clearly abstraction levels can be a critical factor in maintaining conditions in which preservation of the remains is viable. In addition, there are waterlogged deposits that are specifically associated with chalk, such as springs and their intimately associated wetlands which again can contain important archaeological information, especially palaeo-environmental evidence.

Figure D. 8 Heritage Assets



Likely Evolution of the Baseline without the WRMP

The NPPF was introduced in 2012 and updated in 2019. It aimed to make the planning system less complex and more accessible, changing the emphasis on planning towards a presumption in favour of development. However, the NPPF states that *"Local Planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal […]. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal."*[104].

Climate change could have variable impacts on heritage assets in the future. Some types of assets and landscapes have already experienced and survived significant climatic changes in the past and may demonstrate considerable resilience in the face of future climate change. For example, global warming is likely to encourage fungal and plant growth and insect infestation which could impact historic building materials with temperate fluctuations also potentially increasing structural problems[105]. However, many more historic assets are potentially at risk from the direct impacts of future climate change[106].

Key Issues Relevant to the WRMP

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

- The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their settings, particularly those which are sensitive to the water environment.

[104] MHCLG (2021) National Planning Policy Framework. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

[105] Historic England (2021) What Are the Effects of Climate Change on the Historic Environment? What Are the Effects of Climate Change on the Historic Environment? | Historic England

[106] English Heritage, now known as Historic England, (2010) Climate Change and the Historic Environment

- The need to protect water-dependent heritage sites during drought conditions.

LANDSCAPE

Baseline Characteristics

Landscape character

Landscape character[107] can be defined as 'a distinct and recognisable pattern of elements, or characteristics, in the landscape that make one landscape different from another, rather than better or worse'. Some landscapes are special because they have a particular amenity value, such as those designated as Areas of Outstanding Natural Beauty (AONB) or National Parks. Others may have an intrinsic value as good examples or be the only remaining examples of a particular landscape type. Some landscapes are more sensitive to development whereas others have a greater capacity to accommodate development. Assessments of landscape character and landscape sensitivity enable decisions to be made about the most suitable location of development to minimise impacts on landscapes.

Implementation of WRMP options has the potential to influence landscape, for example through effects arising from construction of new infrastructure, raising of reservoir levels or the abstraction of water affecting existing water levels in rivers.

The assessment area is flat and predominantly arable, with the only major city being Cambridge. The area features three major country parks: Coton, Milton and Wandlebury. The visual landscape characteristics of the relevant Natural Character Areas (NCA) are shown in **Figure D.3** and are included in **Table D-12** below.

Nationally Designated Sites

AONBs are defined as 'precious landscapes whose distinctive character and natural beauty are so outstanding that it is in the nation's interest to safeguard them'[108]. They are designated under National Parks and Access to the Countryside Act, 1949, strengthened by the Countryside and Rights of Way Act, 2000. The primary purpose of an AONB is 'to conserve and enhance the natural beauty of the landscape.' There are no AONBs within, or partially within, the assessment area.

Green Belt

The main characteristics of Green Belt are its openness and permanence. The main aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open. The Green Belt therefore aims to check the unrestricted sprawl of large built-up areas; prevent neighbouring towns merging into one another; assist in safeguarding the countryside from encroachment; preserve the setting and special character of historic towns; and assist in urban regeneration while encouraging the recycling of derelict and other urban land.

A proportion of the Cambridge Water supply area is covered by the Cambridge Green Belt, which surrounds the city. The Cambridge Green Belt stretches from Great Eversden in the west to Newmarket in the east and from Fowlmere in the south to Cottenham in the North.

Tranquillity Areas

'Tranquillity' can be defined as the quality of calm that is experienced by people in places full of the sights and sounds of nature. The Campaign for Rural England (CPRE) developed tranquillity mapping for England to identify areas that are either disturbed or undisturbed by urban areas (towns and cities), traffic (road, rail and airports), power stations, pylons, power lines and open-cast mines[109]. Effects on tranquil areas will be considered when assessing the WMRP options.

Table D-12 Landscape Character Areas: Landscape Characteristics

Area (Shown in Figure D.3	
The Fens	Expansive, flat, open, low-lying wetland landscape influenced by the Wash estuary, and offering extensive vistas to level horizons and huge skies throughout, provides a sense of rural remoteness and tranquillity. Open fields, bounded by a

[107] Natural England (2014) An approach to Landscape Character Assessment. landscape-character-assessment.pdf (publishing.service.gov.uk)

[108] http://www.landscapesforlife.org.uk/

[109] CPRE tranquillity mapping for England: http://www.cpre.org.uk/what-we-do/countryside/tranquil-places

Area (Shown in Figure D.3	
	network of drains and the distinctive hierarchy of rivers (some embanked), have a strong influence on the geometric/rectilinear landscape pattern. The structures create local enclosure and a slightly raised landform, which is mirrored in the road network that largely follows the edges of the system of large fields. The drains and ditches are also an important ecological network important for invertebrates, fish including spined loach, and macrophytes.
Bedfordshire and Cambridgeshire Claylands	The River Great Ouse and its tributaries meander slowly across the landscape, and the River Nene and the Grand Union Canal are also features. Three aquifers underlie the National Character Area (NCA) and a large manmade reservoir, Grafham Water, supplies water within and outside the NCA. Brickfields of the Marston Vale and Peterborough area form distinctive post-industrial landscapes with man-made waterbodies and landfill sites. Restoration of sand and gravel workings has left a series of flooded and restored waterbodies within the river valleys.
East Anglian Chalk	The underlying geology is Upper Cretaceous Chalk, which is covered in a surface deposit of ice and river-deposited material laid down during the last ice age. This creates a visually simple and uninterrupted landscape of smooth, rolling chalkland hills with large regular fields enclosed by low hawthorn hedges, with few trees, straight roads and expansive views to the north. Certain high points have small beech copses or 'hanger', which are prominent and characteristic features in the open landscape. In the east there are pine belts.
South Suffolk and North Essex Clayland	The agricultural landscape is predominantly arable with a wooded appearance. There is some pasture on the valley floors. Field patterns are irregular despite rationalisation, with much ancient countryside surviving. Field margins support corn bunting, cornflower and brown hare. The area's open yet wooded character is sufficiently endowed with copses and small woods to have wooded horizons, which give a large, distantly wooded character to the landscape – an impression that is sometimes missing at close quarters due to the loss of hedges and hedgerow trees. Larger woods are typically confined to the north and south of the area. Within the valleys, the main impression is of the blocks of willows and poplars planted on the valley floor and sides.
Bedfordshire Greensand Ridge	The dominant and highly visible north-west-facing scarp slope with its mix of coniferous and deciduous woodland, pasture, arable and heathland overlooks Milton Keynes and the Marston Vale; the ridge offers fine panoramic views out over the surrounding landscape, including reciprocal views of and from the Chilterns to the south. The undulating dip slope is a mix of arable land and estate parklands, villages and woodlands, giving the impression of a carefully tended landscape.

Likely Evolution of the Baseline without the WRMP

The intrinsic planning policy in the updated 2019 NPPF is to enable and facilitate growth whilst aiming to protect the character of areas. The 2019 NPPF re-iterates that more weight should be given to conserving landscape and scenic beauty in National Parks and AONBs which have the highest status of protection in relation to landscape and scenic beauty. The NPPF identifies that planning permission should be refused for major developments in these designated areas except in exceptional circumstances and where it can be demonstrated that they are in the public interest.

The NPPF states that planning policies and decisions should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes while recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services. The policy is clear that appropriate housing development is required and planning policies should identify opportunities for villages to grow and thrive.

With the pressures for housing in parts of the assessment area, there are likely to be some threats to visual amenity more broadly beyond designated landscape areas (including within Green Belt). Climate change and land use change (such as due to agricultural reform associated with the UK's exit from the EU and Common Agricultural Policy) may also, in the longer term, lead to changes to landscape character.

Key Issues Relevant to the WRMP

The key sustainability issue arising from the baseline assessment for landscape is:

- The need to protect and improve the natural beauty of the region's National Parks and other landscapes of natural beauty.
- The need to protect and improve the character of landscapes and townscapes.

APPENDIX E DEFINITIONS OF SIGNIFICANCE

Table **E-1** outlines the specific guidance that has been developed for what constitutes a significant effect, a minor effect or a neutral effect for each of the SEA objectives. These 'definitions of significance' help to ensure a consistent approach to interpreting the significance of effects and will help the reader understand the decisions made by the assessor. This table may be updated to reflect changes in the thresholds as the assessment methodology evolves.

Table E-1 Definitions of Significance

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	• Will it protect, restore 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)? • Will it protect, restore and enhance non-designated sites and local biodiversity? • Will it provide opportunities for new terrestrial and aquatic habitat creation or restoration and/or link existing habitats as part of the development process? • Will it provide opportunities to deliver biodiversity net gain? • Will it lead to a change in the ecological quality of habitats? • Will it protect, restore and enhance where appropriate, coastal and marine habitats and species? • Will it maintain and enhance the green infrastructure network and the biodiversity it supports? • Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems?	**+++**	Major/Significant Positive	The option would result in a major enhancement on the quality of designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat quality and availability. The option would result in a major increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or large amounts of creation or enhancement of habitat, promoting a major increase in ecosystem structure and function.
		++	Moderate Positive	The option would result in a moderate enhancement on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a moderate increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or moderate amounts of creation or enhancement of habitat, promoting a moderate increase in ecosystem structure and function.
		+	Minor Positive	The option would result in a minor enhancement of the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a minor increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or small amounts of creation or enhancement of habitat, promoting a minor increase in ecosystem structure and function.
		0	Neutral	The option would not result in any effects on designated or non-designated sites including habitats and/or species).
		-	Minor Negative	The option would result in a minor negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a minor decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or small losses or degradation of habitat leading to a minor loss of ecosystem structure and function.
		--	Moderate Negative	The option would result in a moderate negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a moderate decrease in the population of, or habitats for, a priority species.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
				Effects could be caused by detrimental changes in flows/water quality, or moderate loss or degradation of habitat leading to a moderate loss of ecosystem structure and function.
		---	Major/Significant Negative	The option would result in a major negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a major decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or large losses or degradation of habitat leading to a major loss of ecosystem structure and function.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
2. To protect and enhance sustainable natural resources and the ecosystem services they provide.	• Will it protect or enhance natural capital and ecosystem services? • Will it maintain and enhance ecosystem resilience? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e., within their limits and capacities taking into account climate change adaptability? • Will it provide opportunities for climate adaptation and protect the climate resilience of vulnerable and priority sites	+++	Major/Significant Positive	The option would lead to a major increase in natural capital/ecosystem resilience and enhancement (as measured by the NCA). The option would lead to a biodiversity net gain of greater than 10% (as measured by the BNG assessment). The option would protect and enhance all the ecosystem services identified in the NCA (biodiversity and habitat, climate regulation, natural hazard regulation, water purification, water regulation, recreation and tourism, health and well-being and agricultural).
		++	Moderate Positive	The option would lead to a moderate increase in natural capital/ecosystem resilience and enhancement (as measured by the NCA). The option would lead to a biodiversity net gain of 10% (as measured by the BNG assessment). The option would protect and enhance at least three categories of ecosystem services identified in the NCA (with neutral effects on the remaining services).
		+	Minor Positive	The option would lead to a minor increase in natural capital/ecosystem resilience and enhancement (as measured by the NCA). The option would lead to a biodiversity net gain of less than 10% (as measured by the BNG assessment). The option would protect and enhance at least one category of ecosystem services identified in the NCA (with neutral effects on the remaining services).
		0	Neutral	The option would have no effect on natural capital, biodiversity net gain or ecosystem services.
		-	Minor Negative	The option would lead to a minor decrease in natural capital/ecosystem resilience (as measured by the NCA). The option would lead to a biodiversity net loss of less than 10% (as measured by the BNG assessment). The option would adversely affect at least one category of ecosystem services identified in the NCA (with neutral effects on the remaining services).
		--	Moderate Negative	The option would lead to a moderate decrease in natural capital/ecosystem resilience (as measured by the NCA). The option would lead to a biodiversity net loss of 10% (as measured by the BNG assessment).

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
				The option would adversely affect at least three categories of ecosystem services identified in the NCA (with neutral effects on the remaining services).
		---	Major/Significant Negative	The option would lead to a major decrease in natural capital/ecosystem resilience (as measured by the NCA). The option would lead to a biodiversity net loss of greater than 10% (as measured by the BNG assessment). The option would adversely affect all categories of ecosystem services identified in the NCA.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
3. To avoid and minimise the risk of spread of, and, where required, manage invasive and non-native species (INNS).	• Will it prevent or minimise the risk of spread/introduction of invasive and non-native species? • Will it contribute to the eradication of invasive and non-native species, where they are already present and it is technically and economically feasible to do so?	+++	Major/Significant Positive	The option would result in a major reduction or management of INNS.
		++	Moderate Positive	The option would result in a moderate reduction or management of INNS.
		+	Minor Positive	The option would result in a minor reduction or management of INNS.
		0	Neutral	The option would not result in any effects on INNS.
		-	Minor Negative	The option would result in a minor increase or spread of INNS.
		--	Moderate Negative	The options would result in a moderate increase or spread of INNS.
		---	Major/Significant Negative	The option would result in a major increase or spread of INNS.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
4. To protect and enhance soil quantity, quality	• Will additional land be required for the development or implementation of the option or will the option	+++	Major/Significant Positive	The option would result in a major enhancement on the quality of soils as a result of remediation. implementation of catchment approaches, or other measures.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
and functionality and geodiversity and ensure the appropriate and efficient use of land.	require below ground works leading to land sterilisation? • Will it avoid damage to, protect and enhance where possible protected sites designated for their geological interest (GCR sites, SSSI and RIGS) and features of wider geodiversity interest? • Will it minimise the loss of best and most versatile agricultural land? • Will it minimise land contamination? • Will it ensure efficient use of land (e.g., make use of previously developed land)? • Will it contribute towards a catchment-wide approach to land management? • Will it avoid adverse effects on other land uses (such as forestry)?	++	Moderate Positive	The option would result in a moderate enhancement on the quality of soils as a result of remediation, implementation of catchment approaches, or other measures.
		+	Minor Positive	The option would be located on a brownfield site and has no effect on soils or existing land use. The option results in the remediation of contaminated land.
		0	Neutral	The option would not result in any effects on soils or land use.
		-	Minor Negative	The option would not be located on a brownfield site and/or results in a minor loss of best and most versatile agricultural land or is in conflict with existing land use. The option would result in land contamination. The option would result in a minor negative effect on a site designated for their geological interest.
		--	Moderate Negative	The option would result in a moderate loss of best and most versatile agricultural land or is in substantial conflict with existing land use. The option would result in land contamination. The option would result in a moderate negative effect on a site designated for their geological interest. The option would be partially overlying mineral resources leading to partial mineral sterilisation.
		---	Major/Significant Negative	The option would result in a major loss of best and most versatile agricultural land or is in substantial conflict with existing land use. The option would result in land contamination. The option would result in a major negative effect on a site designated for their geological interest. The option would be directly overlying mineral resources leading to mineral sterilisation.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
5. To protect and enhance surface and ground water levels and flows.	• Will it minimise the demand for water resources? • Will it result in changes to river flows, channel morphologies, wetted width or river levels? • Will it result in changes to groundwater levels?	+++	Major/Significant Positive	The option would result in major reduction in the demand for water.
		++	Moderate Positive	The option achieves savings through demand management and does not require abstraction to achieve yield. The option would result in moderate reduction in demand for water.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
	• Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will it alter the flow regime of surface waters? • Will it result in changes to river flows, channel morphologies, wetted width or river levels?	+	Minor Positive	The option achieves savings through demand management and does not require abstraction to achieve yield. The option would result in minor reduction in the demand for water.
		0	Neutral	The option would have no discernible effect on river flows or on groundwater levels.
		-	Minor Negative	The option would result in minor short-term decreases in river flows, wetted width, depth, and velocity over small distances. The option would result in minor decreases in groundwater levels. The option would result in minor increases in demand for water.
		--	Moderate Negative	The option would result in medium-term, moderate decreases in river flows, wetted width, depth, and velocity over moderate distances. The option would result in moderate decreases in groundwater levels. The option would result in moderate increases in demand for water.
		---	Major/Significant Negative	The option would result in major decreases in river flows over the long-term affecting significant stretches of river. The option would result in major decreases in groundwater levels. The option would result in major increases in demand for water.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
6. To protect and enhance the quality of surface and groundwater resources.	• Will it prevent pollution and protect and improve surface, groundwater, estuarine and coastal water quality? • Will it prevent the deterioration of Water Framework Directive (WFD) waterbody status (or potential)? • Will it support the achievement of WFD protected area objectives? • Will it ensure a new activity or new physical modification does not prevent the future achievement of good status for a water body? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will the option prevent nutrient loading in water bodies?	+++	Major/Significant Positive	The option would result in addressing failure of WFD Good Ecological Status / Good Ecological Potential.
		++	Moderate Positive	The option would contribute to addressing failure of WFD Good Ecological Status / Good Ecological Potential.
		+	Minor Positive	The option would contribute to a minor improvement in surface/coastal water quality or in groundwater quality.
		0	Neutral	The option would have no discernible effect on river flows or surface/coastal water quality or on groundwater quality. The option would not lead to a change in WFD classification.
		-	Minor Negative	The option would have a minor effect on river and/or coastal water quality and lead to short term or intermittent effects on receptors (e.g., designated habitats, protected species or recreational users of rivers and the coastline) that could not be avoided but could be mitigated. The option would result in minor decreases in groundwater quality.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		--	Moderate Negative	The option would have a moderate effect on river and/or coastal water quality and lead to long term or continuous effects on receptors (e.g., designated habitats, protected species or recreational users of rivers and the coastline) that could not reasonably be mitigated. The option would result in the likely deterioration of WFD classification. The option would result in moderate decreases in groundwater quality.
		---	Major/Significant Negative	The option would have a major effect on river and/or coastal water quality and lead to long term or continuous effects on receptors (e.g., designated habitats, protected species or recreational users of rivers and the coastline) that could not reasonably be mitigated. The option results in the deterioration of WFD classification. The option would result in major decreases in groundwater quality.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
7. To reduce or manage flood risk.	• Will the option be at risk of flooding now or in the future? • Will it have the potential to cause or exacerbate flooding in the catchment area including the risks to people and property, now or in the future? • Will it have the potential to help alleviate or mitigate flooding in the catchment area including to people and property now or in the future? E.g. will it avoid reducing flood plain storage, or provide opportunities to improve flood risk management? • Wil it promote the use of sustainable drainage systems? • Will it promote opportunities for collaborative working with other risk management authorities?	+++	Major/Significant Positive	The option would result in a major improvement to flood risk.
		++	Moderate Positive	The option would result in a moderate improvement to flood risk.
		+	Minor Positive	The option would involve the construction of above-ground water supply infrastructure which would help alleviate flooding in the catchment.
		0	Neutral	The option would involve the construction of above-ground water supply infrastructure, but is located outside floodplain areas. It is anticipated that the option would neither cause nor exacerbate flooding in the catchment.
		-	Minor Negative	The option would involve the construction of above-ground water supply infrastructure which would be wholly or partially located within Flood Zone 2.
		--	Moderate Negative	The option would involve the construction of above-ground water supply infrastructure which would be partially (but < 40% by area) located within Flood Zone 3 and/or site is at medium risk of surface water flooding.
		---	Major/Significant Negative	The option would involve the construction of above-ground water supply infrastructure which would be wholly or partially (≥40% of the site) within flood zone 3a or 3b and/or site is at high risk of surface water flooding.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
8. To minimise emissions of pollutant gases and particulates and enhance air quality.	• Will it maintain or enhance ambient air quality, keeping pollution below Local Air Quality Management thresholds (e.g., in Air Quality Management Areas or sensitive habitats)?	+++	Major/Significant Positive	The option would result in a major enhancement of the air quality within one or more AQMAs.
		++	Moderate Positive	The option would result in a moderate enhancement of the air quality within one or more AQMAs.
		+	Minor Positive	The option would result in an enhancement of the air quality.
		0	Neutral	The option would not result in any effects on Air Quality and AQMAs. Vehicle movements of < 1,000 per annum, assuming that this is equivalent to < 5 per day.
		-	Minor Negative	The option would result in a decrease of the air quality. Vehicle movements of 1000 to < 7,750, per annum assuming that this is an equivalent to 5 to <35 per day (so an average max of 5 per hour)
		--	Moderate Negative	The option would result in a decrease of the air quality within one or more AQMAs. Vehicle movements of 7,750 to <15,500 per annum assuming that this is an equivalent to 35 to <70 per day (so an average max of 10 per hour)
		---	Major/Significant Negative	The option would result in a major decrease in the air quality within one or more AQMAs. Vehicle movements > 15,500 per annum, assuming that this is an equivalent of ≥ 70 per day.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
9. To reduce greenhouse gas emissions.	• Will it reduce or minimise greenhouse gas emissions? • Will it have a low level of embodied carbon? • Will it provide new infrastructure that is energy efficient and/or minimises the use of energy? • Will it provide new infrastructure that could contribute or make use of renewable energy sources? • Will the option affect carbon sequestration?	+++	Major/Significant Positive	The option would reduce operational carbon emissions by more than 1,000 tonnes CO2e/year e.g., it would provide new infrastructure/assets that maximise the use of renewable energy sources. The option would result in a major increase in carbon sequestration.
		++	Moderate Positive	The option will reduce operational carbon emissions by between 100 and <1,000 tonnes CO2e/year. The option will result in a moderate increase in carbon sequestration
		+	Minor Positive	The option will reduce operational carbon emissions by less than 100 tonnes CO2e/year
		0	Neutral	The option would have no discernible effect on greenhouse gas emissions.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		-	Minor Negative	The construction of the option would use of materials with a minor amount of embodied carbon (100 to <1,000 tonnes CO2e). The option would result in a minor or temporary increase in operational carbon emissions (100 to <500 tonnes CO2e).
		--	Moderate Negative	The construction of the option would use of materials with a moderate amount of embodied carbon (1,000 to 7,500 tonnes CO2e). The option would result in a moderate increase in operational carbon emissions (500-2,000 tonnes CO2e). The option will result in a moderate release of previously sequestered carbon.
		---	Major/Significant Negative	The construction of the option would use of materials with a major amount of embodied carbon (>7,500 tonnes CO2e). The option would result in major or long term increases in operational carbon emissions (>2,000 tonnes CO2e). The option would result in a major release of previously sequestered carbon.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
10. To adapt and improve resilience to the threats of climate change.	• Will it improve resilience and/or adaptability to the likely effects of climate change, e.g., by increasing resilience of water supplies or catchments? • Will it increase environmental resilience to the effects of climate change including to impacts on flood risk and water quality? • Will coastal erosion have consequences on the operation of this option now or in the future, taking account of expected climate change sea level rise?	+++	Major/Significant Positive	The option would have a major positive effect on increasing the resilience/decreasing the vulnerability to climate change effects.
		++	Moderate Positive	The option would have a moderate positive effect on increasing the resilience/decreasing the vulnerability to climate change effects.
		+	Minor Positive	The option would have a minor positive effect on increasing the resilience/decreasing the vulnerability to climate change effects.
		0	Neutral	The option would have no effect on resilience/decrease vulnerability to climate change effects
		-	Minor Negative	The option would not increase resilience/decrease vulnerability to climate change effects.
		--	Moderate Negative	The option would have a moderate negative effect on resilience/decreasing vulnerability to climate change effects.
		---	Major/Significant Negative	The option would have a major negative effect on resilience/significantly decrease vulnerability to climate change effects.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	• Will it ensure that sufficient water resources infrastructure is in place to support predicted population increases? • Will it ensure sufficient infrastructure is in place to sustain a seasonal influx of tourists? • Will it help to meet the employment needs of local people? • Will it ensure that an affordable supply of water is maintained, and vulnerable customers protected? • Will it contribute to sustaining and growing the local and regional economy? • Will it avoid disruption through effects on the transport network? • Will it avoid negative effects on built assets/ existing infrastructure including transport?	**+++**	Major/Significant Positive	The option would provide an additional design capacity of ≥25Ml/d. The option would result in a significant increase in construction jobs (capital spend of ≥£25m).
		++	Moderate Positive	The option would provide an additional design capacity of 5Ml/d to<25Ml/d. The option would result in a moderate increase in construction jobs (capital spend £5m to <£25m).
		+	Minor Positive	The option would provide an additional design capacity of 1Ml/d to <5Ml/d. The option would result in a minor increase in construction jobs (capital spend £1m to <£5m).
		0	Neutral	The option would have no effect on local employment opportunities, the regional or local economy, or on recreational facilities. The option would provide an additional design capacity of <1Ml/d.
		-	Minor Negative	It is not expected that any options will have a negative effect on employment opportunities, the economy or design capacity. The option would result in a minor disruption on built assets and infrastructure, including transport.
		--	Moderate Negative	It is not expected that any options will have a negative effect on employment opportunities, the economy or design capacity. The option would result in a moderate disruption on built assets and infrastructure, including transport.
		---	Major/Significant Negative	It is not expected that any options will have a negative effect on employment opportunities, the economy or design capacity. The option would result in a major disruption on built assets and infrastructure, including transport.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
12. To maintain and enhance tourism and recreation.	• Will it protect and enhance public access to, and enjoyment of, green and blue infrastructure, open space/recreational facilities and the natural and historic environment, and in doing so help promote healthy lifestyles including mental well-being?	**+++**	Major/Significant Positive	The option would provide new, and/or significantly enhances existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		++	Moderate Positive	The option would have a moderate positive effect on existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area
		+	Minor Positive	The option would have a minor positive effect on existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		0	Neutral	The option would not result in any effects on existing recreational facilities and/or tourism.
		-	Minor Negative	The option would reduce the availability and quality of existing recreational facilities and/or tourism within the operational area.
		--	Moderate Negative	The option would result in the permanent removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		---	Major/Significant Negative	The option would result in the removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
13. To protect and enhance human health and well-being.	• Will it ensure the continuity of a safe and secure drinking water supply? • Will it help to protect or improve drinking water quality? • Will it maintain surface water and bathing water quality within statutory standards? • Will it help to promote healthy communities and avoid risks to health and wellbeing (for example, due to noise resulting from construction traffic or disruption to safe and reliable water/sewerage services)? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it be located in an area considered to be significantly more health deprived than others in the region? • Will it improve opportunities for social interaction and community cohesion?	**+++**	Major/Significant Positive	The option would lead to a major increase in design capacity (≥25 Ml/d) of drinking water, would have a sustained positive effect on the health of local communities and would ensure that surface water and bathing water quality is maintained within statutory limits.
		++	Moderate Positive	The option would lead to a moderate increase in design capacity (5Ml/d to <25Ml/d) of drinking water, would have a positive effect on the health of local communities and would ensure that surface water and bathing water quality is maintained within statutory limits.
		+	Minor Positive	The option would lead to a minor increase in design capacity (1Ml/d to <5Ml/d) of drinking water, would have a temporary positive effect on the health of local communities and would ensure that surface water and bathing water quality is maintained within statutory limits.
		0	Neutral	The option would not result in any effects on human health and existing recreational facilities and/or tourism.
		-	Minor Negative	The option would result in the deterioration of surface water or bathing water quality and would have a temporary effect on human health (e.g., noise or air quality).
		--	Moderate Negative	The option would have a moderate long-term negative effect on human health (e.g., noise or air quality).
		---	Major/Significant Negative	The option would have a significant long-term effect on human health (e.g., noise or air quality).

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
14. To promote and enhance the sustainable and efficient use of resilient water resources.	• Will it lead to reduced leakage from the supply network? • Will it improve efficiency in water consumption? • Will it ensure sustainable abstractions, taking account of water resource availability? • Will it enable efficient water resource management to help maintain a supply-demand balance? • Will it increase the resilience of water resources, now and into the future? • Will it contribute towards improving the awareness of water sustainability?	**+++**	Major/Significant Positive	The option would involve a major reduction in leakage from the supply network or is a water efficiency option with a design capacity of >10 Ml/d. The option would result in a major improvement in water efficiency and resilience.
		++	Moderate Positive	The option would involve a moderate reduction in leakage reduction from the supply network or is a water efficiency option with a design capacity of 5 to 10Ml/d. The option would result in a moderate improvement in water efficiency and resilience.
		+	Minor Positive	The option would involve reducing leakage from the supply network or is a water efficiency option with a design capacity of <5 Ml/d. The option would result in a minor improvement in water efficiency and resilience.
		0	Neutral	The option will have no effect on sustainable and efficient use of resilient water resources.
		-	Minor Negative	The option would result in minor decreases in water efficiency and reduces resilience.
		--	Moderate Negative	The option would result in moderate decreases in water efficiency and reduces resilience.
		---	Major/Significant Negative	The option would result in major decreases in water efficiency and reduces resilience.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
15. To minimise waste, promote resource efficiency and move towards a circular economy.	• Will it make use of existing infrastructure? • Will it promote the re-use and recycling of waste materials and reduce the proportion of waste sent to landfill? • Will it help to encourage sustainable design or use of sustainable materials (e.g., supplied from local resources)?	**+++**	Major/Significant Positive	The option would make extensive reuse of existing built assets and infrastructure. The option will re-use or recycle substantial quantities of waste materials and any new infrastructure will incorporate substantial sustainable design measures and materials.
		++	Moderate Positive	The option would make reuse of existing built assets and infrastructure. The option would re-use or recycle moderate quantities of waste materials and any new infrastructure would incorporate some sustainable design measures and materials.
		+	Minor Positive	The option would re-use or recycle limited quantities of waste materials and any new infrastructure would incorporate limited sustainable design measures and materials.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		0	Neutral	The option would largely rely on existing infrastructure and only require small quantities of additional materials to realise design capacity. Quantities of concrete required are estimated as < 100 tonnes.
		-	Minor Negative	The option would require new infrastructure. The quantities of concrete required are estimated as between 100 to <1,000 tonnes. The option would have limited opportunities for the re-use or recycling of waste materials. There would be limited opportunities for sustainable design or the use of sustainable materials.
		--	Moderate Negative	The option would require new infrastructure. The quantities of concrete required are estimated as between 1,000 to <15,000 tonnes. The option would have limited opportunities for the re-use or recycling of waste materials.
		---	Major/Significant Negative	The option would require significant new infrastructure that cannot be provided through the re-use or recycling of waste materials. There are no opportunities for sustainable design or the use of sustainable materials. The quantities of concrete required are estimated as ≥ 15,000 tonnes.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	• Will it avoid damage to, conserve or enhance the historic environment, including heritage assets and their settings such as historic buildings, conservation areas, features, places and spaces, that enhance local distinctiveness? • Will it avoid or minimise damage to archaeologically important sites? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it avoid damage to important wetland areas with potential for paleoenvironmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region? • Will it protect or enhance (where relevant) Welsh language and culture?	**+++**	Major/Significant Positive	The option will result in enhancements to designated heritage assets and/or their setting, fully realising the significance and value of the asset, such as: Securing repairs or improvements to heritage assets, especially those identified in the Historic England Buildings/Monuments at Risk Register; Improving interpretation and public access to important heritage assets.
		++	Moderate Positive	The option will result in enhancements to designated heritage assets and/or their setting. Improving interpretation and public access to important heritage assets.
		+	Minor Positive	The option will result in enhancements to non-designated heritage assets and/or their setting.
		0	Neutral	The option will have no effect on cultural heritage assets or archaeology.
		-	Minor Negative	The option will result in the loss of significance of undesignated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected. There will be limited damage to known, undesignated archaeology important sites with a consequent loss of significance only partly mitigated by archaeological investigation
		--	Moderate Negative	The option will result in the loss of significance of undesignated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected. The option will diminish significance of designated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		---	Major/Significant Negative	The option would diminish the significance of designated heritage assets and/or their setting such as: • Demolition or further deterioration in the condition of designated heritage assets especially those identified in the Historic England Buildings/Monuments at Risk Register; • Loss of public access to important heritage assets and lack of appropriate interpretation. There would be major damage to known, designated archaeological sites/remains or geologically important sites with a consequent loss of significance only partly mitigated by archaeological investigation.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
17. To conserve, protect and enhance landscape and townscape character and visual amenity.	• Will it avoid adverse effects to, and enhance where possible, protected/designated landscapes and the settings of designated landscapes (including woodlands) such as National Parks or AONBs? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g., woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it protect and enhance landscape character, townscape, seascape and green infrastructure? • Will it minimise adverse visual impacts?	+++	Major/Significant Positive	The option results in new, above ground infrastructure that significantly enhances the local landscape, townscape or seascape.
		++	Moderate Positive	The option results in new, above ground infrastructure that has a moderate positive effect on the local landscape, townscape or seascape
		+	Minor Positive	The option results in new, above ground infrastructure that has a minor positive effect on the local landscape, townscape or seascape.
		0	Neutral	The option would not result in any effects on the local landscape, townscape or seascape
		-	Minor Negative	The option results in new, above ground infrastructure that has a minor negative effect on the local landscape, townscape or seascape.
		--	Moderate Negative	The option would have a moderate negative effect on a designated landscape or feature (i.e. significant visually intrusive infrastructure) whose effects could not be reasonably mitigated. The option results in new, above ground infrastructure that has a moderate negative effect on the local landscape, townscape or seascape.
		---	Major/Significant Negative	The option would have a negative effect on a designated landscape or feature (i.e. significant visually intrusive infrastructure) whose effects could not be reasonably mitigated. The option results in new, above ground infrastructure that has a major negative effect on the local landscape, townscape or seascape.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain

APPENDIX F REVISED FEASIBLE OPTIONS ASSESSMENT MATRICES

SEE SEPARATE FILE

APPENDIX G PREFERRED OPTIONS ASSESSMENT MATRICES

SEE SEPARATE FILE

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