Anglian Water - Water Resource Management Plan

Strategic Environmental Assessment
Environmental Report - Non-Technical Summary

December 2019

Anglian Water Services Ltd.

Mott MacDonald
22 Station Road
Cambridge CB1 2JD
United Kingdom

T +44 (0)1223 463500
F +44 (0)1223 461007
mottmac.com

Anglian Water Services Ltd.

Anglian Water - Water Resource Management Plan

Strategic Environmental Assessment
Environmental Report - Non-Technical Summary

December 2019

Anglian Water Services Ltd.

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	15.02.18	S. Robinson	N Levy S Price	S Watson	Issue incorporating independent review recommendations
B	17.08.18	S. Robinson	N Levy	S Watson	Issue following consultation
C	07.09.18	S. Robinson	N Levy	S Watson	Final for publication
D	02.12.19	K Dixon	N Levy	N Levy	Final for publication following client updates
E	02.12.19	S Robinson	N Levy	N Levy	Final for publication following client updates

Document reference: 374161 | 014 | E

Information class: Standard

Contents

1 Non-Technical Summary

1.1 Introduction

Anglian Water is required to prepare and publish a Water Resources Management Plan (WRMP). The purpose of a WRMP is to set out a 25-year strategy for managing water supply and demand. New WRMPs are prepared every five years and Anglian Water is due to publish its next WRMP in 2019. When developing a WRMP water companies must follow the Water Resource Planning Guidelines ('WRP Guidelines'). The WRP Guidelines state that a Strategic Environmental Assessment (SEA) is required where new water supply options are needed.[1]

The objective of a SEA, according to Article I of the European Union Directive 2001/42/EC, more commonly known as the SEA Directive, is:

> 'to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans with a view to promoting sustainable development'[2].

In order to do this, the SEA Directive requires plans and programmes (such as the WRMP) to undergo environmental assessment, and suggests that among other factors human health, population and water should be considered as criteria.

1.1.1 Anglian Water

Anglian Water is the largest water and wastewater company in England and Wales by geographic area and is divided into 28 Water Resource Zones[3] (WRZs) (see Figure 1) including the South Humber Bank which is a non-potable WRZ that sits within Central Lincolnshire. It stretches from the Humber north of Grimsby, to the Thames estuary and then from Buckinghamshire to Lowestoft on the east coast. It also covers the Hartlepool area. It should be noted that Hartlepool is not covered in this SEA because no options in the WRMP are being considered for the Hartlepool area.

Anglian Water supply water and water recycling services to more than six million customers in the east of England and Hartlepool[4]. The East of England is one of the driest regions in the UK, with low rainfall (71% of the UK average) and high evaporation losses [5]. Water supply is under

1 EA, NRW, Defra and Ofwat, 2016, "Final Water Resources Planning Guideline", Page 10

2 The SEA Directive does not define what is meant by Sustainable Development. However, the Government SEA Guidance "A Practical Guide to the SEA Directive" (September 2005) sets out what "promotion of sustainability development" means in the UK context. The guidance references the UK Sustainable Development Framework "Our Future – difference paths" (2005) which states "The goal of sustainable development is to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life, without comprising the quality of life for future generations. For the UK Government that goal will be pursued in an integrated way through a sustainable, innovative and productive economy that delivers high levels of employment; and a just society that promotes social inclusion, sustainable communities and personal well-being. This will be done in ways that protect and enhance the physical and natural environment and use resource and energy as efficiently as possible." This definition is reflected in the document 'Mainstreaming sustainable development – The Government's vision and what this means in practice' (Defra, February 2011) which sets out the vision of "stimulating economic growth and tacking the deficit, maximising wellbeing and protecting our environment, without negatively impacting on the ability of future generations to do the same".

3 WRZs represent an area within which managing supply and demand for water resources is largely self-contained. The definition of a WRZ (from Water Resources Planning Tools (WR27), UKWIR, 2012) is: 'The largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers will experience the same risk of supply failure from a resource shortfall'.

4 Water Resources Management Plan 2019 (Anglian Water, 2019)

5 Anglian Water, 2017 "Our Company" [webpage]

pressure from population growth, climate change, sustainability reductions[6] and the need to increase resilience of water supplies to severe drought.

Figure 1: WRZs in the WRMP

Source: WRMP 2019 (Anglian Water, 2019)

1.2 Integrating the Environment into WRMP

The Department for Environment, Food and Rural Affairs' (Defra) Guiding Principles set out the government objective 'to deliver secure, reliable, sustainable and affordable supplies of water, value nature in decision-making and connect people with the environment'[7]. They encourage water companies to act as 'leaders' and 'stewards' of the natural environment, to use the

[6] In some cases, water company abstractions have been found to cause, or the potential to cause, environmental harm. As a result, the company may be required to reduce the amount of water they can abstract from the environment. If this reduces the amount of water available to put into supply, then it is known as a sustainability reduction.

[7] Defra, May 2016 "Guiding Principles for Water Resource Planning", Page 1

WRMP process as an opportunity to connect communities to their local environment and to reflect the value of the environment in decision making by using environmental valuation approaches (natural capital and ecosystem services)[8].

Defra's Guiding Principles state: 'We expect you to thoroughly investigate and report on environmental and social costs and benefits.' In response, Anglian Water has developed a framework for assessing environmental and social costs and benefits and incorporating them into the WRMP development. This includes:

- Qualitative appraisal through the:
  - SEA
  - Habitats Regulations Assessment (HRA)
  - Ecosystem Services Assessment (ESA)
  - Water Framework Directive (WFD) assessment
- Monetised appraisal through customer stated preference surveys

The HRA, ESA, and WFD assessment are presented in separate reports but the results have fed into the SEA by providing evidence for SEA objectives on water quality and ecology.

1.3 WRMP

Anglian Water has adopted a planning approach that uses least-cost optimisation as well as broader criteria to develop a Best Value Plan (Preferred Plan) which takes account of 'best value' decision making criteria:

- Cost to build and operate the plan
- Adaptability and flexibility of the plan to cope with uncertain future needs
- Alignment to the Water Resource East regional strategy
- Resilience of the plan to severe and extreme drought and other hazards, and the residual risks
- Deliverability of the plan with timescales needed to manage risks
- Alignment to customer preferences
- Environmental and social impacts of the plan, including net environmental benefit

The SEA and other environmental studies undertaken were used as part of the decision-making criteria on environmental and social impacts of the plan to develop the Preferred Plan.

Demand management is a priority for Anglian Water. In developing the WRMP, Anglian Water has first considered what risk could be offset from demand management, before seeking to develop supply-side options. Despite the ambitious demand management strategy, the scale of the challenge is such that carefully targeted investment in supply- side capacity was still required. The supply-side options considered for inclusion in the WRMP have been developed following industry and regulator guidance.

The Preferred Plan provides the best value for customers in the long term. The strategy:

- Prioritises demand management, which aligns with customers' expectations
- Recognises the environmental benefits of demand management, such as offsetting treatment and pumping costs and carbon

[8] Defra, May 2016 "Guiding Principles for Water Resource Planning", Page 4

- Challenges Anglian Water and its customers to push the boundaries of what is achievable, with respect to levels of future consumption
- Maximises the use of existing resources before developing new ones
- Provides future flexibility over the location and type of new resource inputs
- Delivers significant additional resilience across the region both to drought and non-drought events (e.g. freeze-thaw)
- Delivers environmental benefits, by reducing abstraction from the environment and ensuring no deterioration in the ecological status of water bodies in the region

The WRMP include an adaptive strategy to deal with uncertainties and future scenarios that will mean further investment is required (e.g. further future sustainability reductions). In some cases, there may not be a long lead time to implement schemes and therefore Anglian Water need to develop a plan which identifies thresholds beyond which they need to take further action. The potential options identified as part of the adaptive strategy have been assessed as part of the SEA. It should be noted that at this stage these are strategic supply side options that may be required in the future. They do not form a definitive list of options.

The Draft WRMP was published for consultation in March 2018, allowing interested stakeholders and customers to review and comment upon the proposals. The feedback received from the consultation process played a significant role in shaping the WRMP.

1.4 The SEA Process

A SEA is required for the Anglian Water WRMP under the SEA Directive and the Environmental Assessment of Plans and Programmes Regulations 2004, which requires an assessment of the effects of certain plans and programmes on the environment.

The SEA also works to inform the decision-making process through the identification and assessment of significant and cumulative effects a plan or programme may have on the environment. The SEA process is conducted at a strategic level and enables consultation on the potential effects of a plan with a wide range of stakeholders.

To support the development of WRMP, Anglian Water commissioned Mott MacDonald to conduct a Strategic Environmental Assessment (SEA).

This Environmental Report presents the results of the SEA process for WRMP including:

- A summary of the SEA Scoping stage
- The results of the high-level environmental screening exercise which was undertaken as a precursor to the main SEA to highlight key environmental risks and constraints
- The results of the WRMP options assessment which was undertaken to assess the feasible list[9] of options using the SEA Framework and develop appropriate mitigation measures
- Assessment of the WRMP (Baseline Least Cost Plan, Alternative Least Cost Plan, Preferred Plan, adaptive strategy) including cumulative effects using the SEA Framework.
- Details of monitoring proposals to be implemented by Anglian Water during the WRMP period.

Anglian Water is committed to delivering all mitigation measures identified by the SEA and HRA.

[9] The ‘feasible list’ is a sub-set of the ‘constrained list’ following options feasibility studies. It is a set of options considered to be suitable to take forward for assessment as part of the preferred programme options. As such it should not include options with unalterable constraints that make them unsuitable for promotion e.g. unacceptable environmental impacts that cannot be overcome. (EA, NRW, Defra and Ofwat, 2016, “Final Water Resources Planning Guideline”, Page 29).

The draft WRMP and Environmental Report were issued for formal consultation from March to May 2018. Following public consultation, responses were reviewed, and the Environmental Report was updated as appropriate. A log of consultation comments and report updates is provided in Appendix O of the Environmental Report.

1.5 SEA Scoping Stage Results

The scoping stage of the SEA process sets the context and scope for the SEA and Environmental Report. The scoping stage for the WRMP was undertaken and a Scoping Report produced in April 2017. The Scoping Report was issued for a five-week statutory consultation period to the three Consultation Bodies: Environment Agency, Natural England, and Historic England. Comments received were taken into consideration in the preparation of the Environmental Report.

The scoping process identified the relevant plans and programmes at International, National, Regional, and Local level and their implications for the SEA and WRMP. Scoping also set the environmental, social, and economic baseline context for the Anglian Water area, and identified key environmental and sustainability challenges and opportunities. The baseline data was further updated during the SEA options assessment to include site specific baseline data for each of the options.

A key stage in the SEA process is the development of the SEA Framework which includes SEA objectives and indicators. The SEA objectives were used during the assessment stage to appraise the WRMP options and solutions to determine their potential environmental effects. The WRMP SEA objectives were developed to reflect and support the Anglian Water outcomes for customers and the environment, the Defra Guiding Principles for water resource planning, and the Defra Strategy to 2020 ‘Creating a great place for living’.

The SEA objectives for the Anglian Water WRMP are:

- Protect water sources and their quality to deliver a reliable, clean, and safe water supply for customers
- Protect and enhance the resilience of water supplies and the environment to natural and man-made hazards
- Deliver a reliable and sustainable water supply that is flexible to cope with changing growth in demand and enable economic growth
- Strive to become leaders of the natural environment through enhancement of ecological diversity and networks
- Protect and enhance landscape character and land quality
- Protect and enhance the historic environment and cultural diversity of the region
- Lead by example on reducing greenhouse gas emissions and conserving natural resources by making decarbonisation and resource efficiency central to decision-making
- Protect community amenity through ensuring operations do not cause nuisance for local communities
- Contribute to the local economy and economic growth
- Connect customers to the environment and provide recreational benefits through new, or enhancement to existing, water parks and nature reserves

1.6 High Level Environmental Screening

As a precursor to the SEA and HRA, a high-level environmental screening exercise was undertaken to highlight environmental risks and constraints at an early stage in the options development process, in accordance with the United Kingdom Water Industry Research (UKWIR) guidance. The environmental screening findings have been used as supporting evidence for the rejection of options to avoid potentially significant environmental effects, or to identify suitable mitigation measures to be incorporated into option development. The results were also taken forward into the SEA and HRA for WRMP.

1.7 Options Assessment

As part of the WRMP development process Anglian Water undertook modelling to identify areas with a surplus or deficit of water supply. For areas with deficits, Anglian Water developed a range of options for maintaining the supply demand balance. These fall into two broad categories:

- Demand management options – options that will reduce the demand for water including metering, water efficiency, and leakage reduction.
- Supply options – options that will provide a water supply to customers including transfers, maximising existing resources, trading, tankering, and new resources.

The WRMP is a mix of these two broad categories. Although demand management options are likely to have the least significant environmental effects, if implemented on their own, they will not meet the deficits forecast in the region. Therefore, supply options were also needed.

In addition to demand management options and supply options, the WRMP also includes National Environment Programme (NEP) options. The NEP is a list of environmental improvement schemes that ensure that water companies meet European and national targets related to water. The Environment Agency has identified a number of watercourses, and flora and fauna that they contain, to be at risk from the effects of abstraction. In areas where Anglian Water abstractions are implicated, the Environment Agency has required the company to identify options to mitigate the effects of abstraction as part of the NEP.

The options assessment demonstrated the potential positive and negative effects of the different water resource options that could go forward into the Preferred Plan for WRMP. The common themes from the assessment included:

- Effects on ecological designated sites such as SPA, SAC, Ramsar, SSSI, ancient woodland, NNR, and LNR from direct loss of habitat due to pipeline construction
- Effects on ecological designated sites through species disturbance during construction
- Effects on water dependant designated sites and species through changes to water flow levels and water quality
- Effects on the fabric or setting of heritage assets including listed buildings, scheduled monuments, registered parks and gardens, and conservation areas
- Effects on transport, cyclist, and pedestrians through road and path closures or diversions during construction
- Effects on Marine Conservation Zones and nursery/spawning fisheries from desalination intake and outfall pipelines and screens, and discharged brine
- Opportunity to improve cycle routes and footpaths as part of re-instatement works
- Opportunity to create reservoirs that can be used for recreational activities and/or wildlife conservation

- Opportunity to increase resilience to droughts, leaving more water in the natural system for the environment
- Opportunity to improve customer understanding of their water consumption to facilitate behavioural change

Mitigation and enhancement measures were suggested as part of the SEA options assessment process. Where possible mitigation measures have been incorporated into the options development process and a register records where this has taken place. This has included pipeline re-routing and directional drilling to avoid significant effects on designated sites and heritage assets. Incorporation of these measures at this early strategic stage will help deliver a WRMP that benefits the environment and reduces the risk of significant negative effects and cost-prohibitive mitigation measures further down the line during detailed design of specific options. Following the assessment of the feasible list of options, several options were rejected based on factors including cost, environmental, and delivery. These options were recorded in a rejection register.

1.8 Assessment of the WRMP

The Baseline Least Cost Plan and Alternative Least Cost Plan have been assessed as part of the SEA and the results are included in Appendix N. The section below summarises the assessment of the Preferred Plan for the WRMP.

The assessment is based on the post-mitigation scoring presented in the options assessment appendices. The medium-term effects from the options assessment are included in the summary assessment to demonstrate the effects over the 25-year period of the WRMP. Further details on specific option effects (pre- and post-mitigation), and details of construction and long-term (over 25 years) effects can be found in the option assessment appendices F- K.

The significance of the effect was scored using symbols and colour-coding (see Table 1).

Table 1: Scoring Definitions

Scoring Definitions	
++	Option would have a **major positive** effect in its current form as it would resolve an existing issue or maximise opportunities. SIGNIFICANT
+	Option would have a **minor positive** effect
0	Option would have a neutral or no effect
-	Option would have a **minor negative** effect
--	Option would have a **major negative** effect as it would substantially exacerbate existing problems and/or cause irreversible adverse effects. Consider exclusion of option. SIGNIFICANT
?	Effects of the option are uncertain

Significant negative effects were defined as effects which would exacerbate existing problems and/or cause irreversible negative effects. These were represented by a major negative effect rating and red colour coding in the assessment tables.

Significant positive effects were defined as those effects which would resolve an existing issue or maximise opportunities. These were represented by a major positive rating and dark green colour coding in the assessment tables.

The summary results for the Preferred Plan for the WRMP are presented in Table 2. More detailed assessments for options within the WRMP can be found in the relevant options assessment appendices of the main Environmental Report (Appendix F – K). The cumulative effects of the WRMP are presented in section 6.6 of the main Environmental Report.

The WRMP is likely to have an overall positive effect on delivering reliable and sustainable water supplies that are flexible to cope with future changing growth and demand. Positive effects identified include increased availability and resilience of water supplies for human use; increased availability of water within the natural environment thus increasing resilience, benefiting water dependant ecological sites, and maintaining an attractive natural landscape; reducing the need for future water supply infrastructure; and allowing customers to understand their water usage. Where negative effects were identified in the options assessment, these have been mitigated where possible through the options design process by re-routing pipelines or using directional drilling under sensitive sites and rivers or investigated further through the HRA and WFD processes. The use of best practice construction methods will also be utilised to minimise any effects during the construction phase. Minor residual negative effects remain for option ESU1 due to the predicted moderate effects on WFD objectives and effects of brine discharge on ecology. Where effects relating to greenhouse gas emissions were known, all options had minor negative effects apart from the ESU1, SHB2 and SLN6 options where major negative effects were identified. Future consideration of renewable energy options would reduce these effects. Anglian Water is committed to delivering the required mitigation to deliver the options defined in the WRMP.

1.9 Monitoring the effects of the WRMP

Monitoring the negative effects of implementing the WRMP is an essential on-going element of the SEA process. Monitoring helps ensure that the identified SEA objectives are being achieved, allows early identification of unforeseen adverse effects and thus appropriate remedial action can be taken.

Negative effects or uncertainty identified during the SEA process were focussed on effects on ecology, carbon emissions, landscape, and the historic environment. Indicators for monitoring these potential issues were developed and indicators for recording the potential benefits that the WRMP achieves (e.g. recreational assets created, waste recycle/reused) were developed and included within the monitoring proposals.

Table 2: WRMP Preferred Plan Summary Results

Options	Option Name	SEA Objectives									Commentary
		Protect water sources and their quality to deliver a reliable, clean, and safe water supply for customers	Protect and enhance the resilience of water supplies and the environment to natural and man-made hazards	Strive to become leaders of the natural environment through enhancement of ecological diversity and	Protect and enhance landscape character and land quality	Protect and enhance the historic environment and cultural diversity of the region	Lead by example on reducing greenhouse gas emissions and conserving natural resources by making decarbonisation and resource efficiency central to decision-making	Protect community amenity through ensuring operations do not cause nuisance for local communities	Contribute to the local economy and economic growth	Connect customers to the environment and provide recreational benefits through new, or enhancement to existing, water parks and nature reserves	
Extended Plus Demand Mgt Strategy		+	+	+	+	0	-	0	+	+	Positive effects include increased availability of water within the natural environment increasing resilience, benefiting water dependant ecological sites, maintaining an attractive natural landscape, reducing the need for future water supply infrastructure, and allowing customers to understand their water usage. Mitigation measures will be implemented during leakage reduction works to minimise effects on ecology, landscape, the historic environment, and the community.
BHV5	Newmarket RZ to Bury Haverhill RZ Transfer (20Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
CLN13a	South Humber Bank RZ to Central Lincolnshire RZ Transfer (31Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
CLN14	South Humber Bank RZ to Central Lincolnshire RZ Transfer (6Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
CLN15	South Humber Bank RZ to Central Lincolnshire RZ Transfer (Existing)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Unlikely to be other positive or negative effects due to the use of existing infrastructure. The CO2e is lower than the scaled operational average.
CLN16	South Humber Bank RZ to Central Lincolnshire RZ Transfer	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
CVY1	Newmarket RZ to Cheveley RZ Transfer	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
ESU1	Felixstowe Desalination	-	+	-	0	0	--	0	+	0	Positive effects include increased resilience of water supplies and opportunities for employment. Mitigation measures will be implemented during construction to reduce effects on water quality, ecology, landscape, and the community. The WFD Phase 2 assessment concluded there would be moderate effects. The effects of brine discharge on water quality and ecology will need to be further investigated once specific project details are known during the design process. A HRA Task II Appropriate Assessment was undertaken to determine effects on European designated sites. It concluded that further assessment is

Options	Option Name	SEA Objectives									Commentary
		Protect water sources and their quality to deliver a reliable, clean, and safe water supply for customers	Protect and enhance the resilience of water supplies and the environment to natural and man-made hazards	Strive to become leaders of the natural environment through enhancement of ecological diversity and	Protect and enhance landscape character and land quality	Protect and enhance the historic environment and cultural diversity of the region	Lead by example on reducing greenhouse gas emissions and conserving natural resources by making decarbonisation and resource efficiency central to decision-making	Protect community amenity through ensuring operations do not cause nuisance for local communities	Contribute to the local economy and economic growth	Connect customers to the environment and provide recreational benefits through new, or enhancement to existing, water parks and nature reserves	
											necessary at the lower tier, project-level assessment but it is assumed that appropriate mitigation can be designed to ensure no reasonable foreseeable effects on site integrity. Carbon emissions will be generated during construction and operation. The scaled CO_2e will be higher than the scaled operational average. Use of renewable energy technologies may reduce effects.
ESU8	Bury Haverhill RZ to East Suffolk RZ Transfer (20Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
ELY9	North Fenland RZ to Ely RZ Transfer (20Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
HPB1	Norwich & the Broads RZ to Happisburgh RZ Transfer	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
HPB2	Norwich and the Broads WRZ to Happisburgh Transfer (East Ruston/Witton)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, historic environment, landscape, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
NFN4	South Fenland RZ to North Fenland RZ Transfer (20Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on water quality, ecology, landscape, and community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
NNR8	Norwich & the Boards RZ to Norfolk Rural North RZ Transfer (5Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average. After applying standard mitigation, a Task 2 AA is not required as there will be no likely significant effects on designated sites.
NTM1	Central Lincolnshire RZ to Nottinghamshire RZ Transfer	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.

Options	Option Name	SEA Objectives									Commentary
		Protect water sources and their quality to deliver a reliable, clean, and safe water supply for customers	Protect and enhance the resilience of water supplies and the environment to natural and man-made hazards	Strive to become leaders of the natural environment through enhancement of ecological diversity and	Protect and enhance landscape character and land quality	Protect and enhance the historic environment and cultural diversity of the region	Lead by example on reducing greenhouse gas emissions and conserving natural resources by making decarbonisation and resource efficiency central to decision-making	Protect community amenity through ensuring operations do not cause nuisance for local communities	Contribute to the local economy and economic growth	Connect customers to the environment and provide recreational benefits through new, or enhancement to existing, water parks and nature reserves	
NWM6	Ely RZ to Newmarket RZ Transfer (20Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on landscape, the historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
RTC2	Ruthamford South RZ to Ruthamford Central RZ Transfer	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
RTN27	South Lincolnshire RZ to Ruthamford North RZ Transfer (67Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
SEX4	East Suffolk RZ to South Essex RZ transfer (15Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
SFN4	Ruthamford North RZ to South Fenland RZ Transfer (40Ml/d)	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
SHB2	Pyewipe Water Reuse for non-potable use	0	+	0	0	0	--	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on water quality, ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. The scaled CO2e will be higher than the scaled operational average. Use of renewable energy technologies may reduce effects.
SLN6	Central Lincolnshire RZ to South Lincolnshire RZ Transfer (63Ml/d)	0	+	0	0	0	--	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on water quality, ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. The scaled CO2e will be higher than the scaled operational average. Use of renewable energy technologies may reduce effects.
THT1	Bury Haverhill to Thetford (existing)	0	+	0	0	0	-	0	0	0	Positive effects included resilience of water supplies. There are not likely to be any effects on ecology, landscape, historic environment therefore there will be no mitigation required. The CO2e is lower than the scaled operational average.
-	Birchmoor WTW	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on water quality, ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.

Options	Option Name	SEA Objectives									Commentary
		Protect water sources and their quality to deliver a reliable, clean, and safe water supply for customers	Protect and enhance the resilience of water supplies and the environment to natural and man-made hazards	Strive to become leaders of the natural environment through enhancement of ecological diversity and	Protect and enhance landscape character and land quality	Protect and enhance the historic environment and cultural diversity of the region	Lead by example on reducing greenhouse gas emissions and conserving natural resources by making decarbonisation and resource efficiency central to decision-making	Protect community amenity through ensuring operations do not cause nuisance for local communities	Contribute to the local economy and economic growth	Connect customers to the environment and provide recreational benefits through new, or enhancement to existing, water parks and nature reserves	
-	Meppershall WTW	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on water quality, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
-	Diddlington WTW	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on water quality, ecology, landscape, historic environment, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.
-	Great Wratting WTW	0	+	0	0	0	-	0	0	0	Positive effects include increased resilience of water supplies. Mitigation measures will be implemented during construction to reduce effects on water quality, landscape, and the community. Carbon emissions will be generated during construction and operation. However, due to the small scale of the works this is lower than the scaled operational average.