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Anglian Water Drought Plan 2022

Strategic Environmental Assessment

Environmental Report

Report for Anglian Water

Report for Anglian Water

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Non-Technical Summary

Anglian Water Services Limited (Anglian Water) is required to prepare and maintain statutory Drought Plans under the Water Industry Act 1991, as amended by the Water Act 2003, the Drought Plan Direction 2020, and Environment Agency guidelines, i.e. the final water company guidance issued in December 2020[1]; and the draft supplementary guidance on environmental assessment which was issued in July 2020[2]. The purpose of Anglian Water's Drought Plan is to demonstrate what actions will be taken to protect public water supplies during a drought and how they intend to minimise any resulting environmental impacts.

Anglian Water published its current statutory Drought Plan in June 2020 (the 'Drought Plan 2019') and prepared its draft Drought Plan for 1 April 2021 to align with updated guidance. The Final Drought Plan was published in 2022 and will encompass the period 2022-2027.

Drought Plans are required to complete a Strategic Environmental Assessment (SEA) under the EU Directive 2001/42/EC, more commonly known as the SEA Directive. This is transposed into UK law via the Environmental Assessment of Plans and Programmes Regulations 2004. This SEA Environmental Report has been prepared for the Drought Plan 2022 and documents the outcomes of the SEA process. It includes both a non-technical summary and a technical assessment. A Habitats Regulations Assessment (HRA) assessment, as well as environmental assessments for associated drought permits, have been undertaken in parallel.

Drought Plans encompass a number of drought options that will only be implemented if and when required. Each drought is different in terms of its severity, season, location and duration and each combination of these factors may require a different response in terms of measures. In the context of drought planning, individual drought options are taken to constitute alternatives.

The SEA provides information on the relative environmental performance of alternatives, and is intended to make the decision-making process more transparent. The SEA can, therefore, be used to support the timing, prioritisation and implementation of drought options within the DP.

AWS is the largest water and wastewater company in England and Wales by geographic area and is divided into 28 Water Resource Zones (WRZs) (see **Figure NTS1**) 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. Anglian Water supply water and water recycling services to more than six million customers in the East of England and Hartlepool[3]. The East of England is the driest region in the UK, with low rainfall (71% of the UK average) and high evaporation losses[4]. Water supply is under pressure from population growth, climate change, sustainability reductions[5], and the need to increase resilience of water supplies to severe drought.

[1] Environment Agency (2020) Water Company Drought Plan guideline, December 2020 (Version 1.2)
[2] Environment Agency (2020) Environmental assessment for water company drought planning supplementary guidance, Version 1.0, Reference LIT 55303, July 2020
[3] Anglian Water (2019) Water Resources Management Plan 2019
[4] Anglian Water (2019) Water Resources Management Plan 2019
[5] 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.

Figure NTS1 Anglian Water's Water Resource Zones

The SEA Process

The SEA screening exercise of Anglian Water's Drought Plan 2022 concluded that there is potential for significant effects from certain options, and therefore a SEA is required 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.

A SEA scoping report was published for consultation in February 2021. Consultation bodies were invited to express their views on the Scoping Report and the scope of the SEA proposed in accordance with SEA Regulation 12(5). The responses from this consultation have been considered in preparation of this Environmental Report.

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 the Drought Plan, Anglian Water commissioned Ricardo to conduct a SEA.

This Environmental Report presents the results of the SEA process for the Drought Plan 2022 including:

- A non-technical summary
- A summary of the SEA Scoping stage

- The results of the Drought Plan 2022 options assessment which was undertaken to assess the options using the SEA Framework
- Details of monitoring proposals to be implemented by Anglian Water during the Drought Plan 2022 period

Assessment Methodology

The assessment has been 'objectives-led'. SEA objectives have been derived from environmental objectives established in law, policy or other plans and programmes, and from a review of the baseline information. The SEA objectives have been categorised under the following topic areas: biodiversity, flora and fauna; population and human health; material assets and resource use; water; soil, geology and land use; air and climate; archaeology and cultural heritage; and landscape and visual amenity; and inter-relationships.

The overall findings of the SEA describe the extent to which objectives for each topic are met by each of the drought options. It should be noted that detailed Environmental Assessment Reports (EARs) have been produced for the supply side drought permit options and these were used to inform the SEA for these options.

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

A cumulative, or in-combination, assessment has also been undertaken which has involved examining the likely significant effects of each of the drought options in combination with each other and in combination with the implementation of other relevant plans and programmes.

The area under consideration for the SEA reflects the spatial scope of the Drought Plan, which extends beyond the boundaries of the Anglian Water supply area to include potential areas of influence from supply side drought options, including the River Trent Abstraction option. Hartlepool WRZ does not contain any identified drought actions or measures and is geographically distinct from the other parts of the supply area. Therefore, it has been excluded from the SEA study area.

Drought Plan Options

The majority of the options in the Drought Plan 2022 are the same as were included in the Drought Plan 2019. However, one drought permit option (Alton Water) has been removed. A description of the Drought Plan 2022 including changes from the Drought Plan 2019 is presented in **Table 0**. The Drought Plan 2022 options cover three key drought management measures:

- Supply side management actions
- Extreme supply side and demand side management actions
- Demand side management actions

Anglian Water's proposals for managing water supplies during a drought follow a 'twin-track' approach. In the first instance, Anglian Water will seek to manage demands on water before using any available supply side measures[6].

[6] Supply side management actions are measures that may be taken to increase supplies of water during a drought, over and above ordinary activities

Table 0 Changes from Drought Plan 2019

Drought Management Measures	Options the same as in Drought Plan 2019	Options changed since the Drought Plan 2019
General	The DP22 is based on a 1 in 200 year level of service. This is consistent with the DP19, and WRMP19.	N/a
Demand side management actions	• Publicity campaigns • Meter optants • Leakage • Temporary water use (Hosepipe) bans • Non-essential use ban restrictions • Emergency Drought Orders (Severe Restrictions)	The following demand side management actions are included in DP22: • Communication campaigns and messaging* • Customer metering* • Water efficiency activities • Targeted leakage reduction* • Temporary Use Ban (TUBs)* • Non-essential Use Ban (NEUBs)* • Emergency drought orders* *These options were included in DP19 but the descriptions have been updated slightly.
Supply side management actions (implemented through Drought Permits)	• River Nene: Wansford Intake (Rutland Water) • River Nene: Dunston Mill Intake (Pitsford Reservoir) • Wellington Wellfield: Stoke Ferry Intake • River Colne Augmentation (Ardleigh Reservoir) • River Wensum: Costessey Boreholes • Great Ouse: Offord Intake (Grafham Water) • River Trent: Newton-on-Trent Abstraction (Hall Water Water Treatment Works)	• River Gipping: Sproughton Intake (Alton Water) – option removed
Extreme supply and demand management actions (do not require Drought Permits)	• Management of inter-company transfers • Road tankering of water to areas where supplies are low • Desalination of brackish water • Return of effluent to different discharge points on rivers to supplement river flows and allow increased abstraction • Transfers of water from one river catchment to another, to supplement flows for abstraction • Bulk transfers of water from other water companies	• Anglian Water is completing further consideration of such options to provide supply benefits before a Level of Service (LoS) 4 trigger is crossed. At present these options are theoretical only.

The following sections describe the different demand and supply side options included in the Drought Plan 2022. These options are likely to be implemented in a phased approach according to need.

'Standard' demand side management actions

Anglian Water may introduce a number of 'standard' demand side measures during a period of drought. The Drought Plan 2022 includes six demand side management actions which were included in the Drought Plan 2019 and therefore considered in the previous SEA, plus one additional demand side management action (Water efficiency activities) which has been considered in the SEA for Drought Plan 2022. These are:

- Customer metering
- Targeted leakage reduction
- Communication campaigns and messaging
- Water efficiency activities
- Temporary water use (Hosepipe) bans (TUBs)
- Non-essential use bans (NEUBs)
- Emergency Drought Orders (Severe Restrictions)

Supply side management actions

The supply side options proposed within the Drought Plan 2022 are associated with the development of potential options to help improve outputs from existing water sources. Reservoir options seek to conserve or increase the amount of water stored (and therefore available for supply) during a drought period, and direct intakes seek to supplement water supply, and in some cases, to help conserve reservoir storage. Groundwater options seek to supplement water supply.

The supply side drought measures outlined in the Drought Plan 2022 will need to be implemented through Drought Permits. Under drought conditions, where a serious deficiency of supplies threatens to occur, or already exists, Anglian Water may require recourse to Drought Orders in order to increase supplies to manage the supply-demand balance. These are emergency options that would need to be further explored with the Environment Agency or neighbouring water companies to clarify the requirements for environmental assessment in advance of Drought Order application. Therefore, only Drought Permits have been assessed as part of the SEA screening.

For existing water sources, Drought Permits are used to increase the amount of water that can be abstracted to supplement supplies and, where possible, to conserve reservoir storage. Anglian Water may also apply for Drought Permits increase winter abstractions. If confirmed, Drought Permits may only be authorised for specified six-month (winter or summer) periods, subject to renewal only for further limited periods.

The Drought Plan 2022 includes seven supply side options that would require a Drought Permit. All options were included in the previous 2019 Drought Plan, and therefore considered in the previous SEA:

- River Wensum: Costessey Boreholes - Increasing the amount of abstraction permitted from groundwater sources at Costessey.
- River Nene: Wansford Intake (Rutland Water) - Changing the current conditions attached to the abstraction from the River Nene at Wansford, which would allow Anglian Water to take more of its licensed abstraction quantities. This will enable increased refilling of Rutland Water during a drought.

- River Nene: Duston Mill Intake (Pitsford Reservoir) - Changing the current conditions attached to the abstraction from the River Nene at Duston Mill, which would allow Anglian Water to take more of its licensed abstraction quantities. This will enable increased refilling of Pitsford Reservoir during a drought.
- Great Ouse: Offord Intake (Grafham Water) - Changing the current conditions attached to the abstraction from the River Great Ouse, which would allow Anglian Water to take more of its licensed abstraction quantities. This will enable increased refilling of Grafham Water during a drought.
- Wellington Wellfield: Stoke Ferry Intake - Increasing the amount of abstraction permitted from groundwater sources at the Wellington Wellfield to reduce reliance on surface water intake.
- River Colne Augmentation (Ardleigh Reservoir) - Increasing abstraction from a groundwater source to supplement flows in the River Colne. This additional water would then be taken out of the river and used to refill Ardleigh Reservoir.
- River Trent: Newton-on-Trent Abstraction (Hall Water Treatment Works) – Temporarily reducing the hands-off flow (HOF), thereby allowing abstraction from the River Trent at Newton-on-Trent for Hall Water Treatment Works to continue in conditions below the current minimum permissible flow.

To support the Drought Plan 2022, individual environmental assessments were carried out for each of the potential Drought Permit options using a structured approach, as outlined in the supplementary guidance[7] to the Environment Agency's Drought Plan Guideline[8], and to provide the information required in relation to monitoring and mitigation. These environmental assessments are used to inform the SEA.

Extreme demand side management actions

There are some potential extreme demand side management options that may be considered during a drought to mitigate the need for rota-cuts in an emergency situation. Anglian Water will develop these options further to provide supply benefits before a Level of Service (LoS) 4 trigger is crossed. At present these options include:

- Metering (smart)
    - Increase active smart meter reading (e.g. hourly)
    - Set specific targets for customers
- Metering (standard)
    - Ask customers to self-report how much water they are using
    - Ask our meter readers to increase data collection frequency
- Household incentivisation (financial rewards or lower tariffs for customers who reduce their water usage)
- Non-Household incentivisation (e.g. incentivise water efficiency schemes, night time tariffing schemes)
- Extreme communications plan (e.g. hard-hitting messages and images, keeping customers aware of current storage situation)
- Leakage
    - Focus resources on leakage prevention (e.g. invest in additional noise sensors to cover impacted areas)

[7] Environment Agency (2020) Environmental assessment for water company drought planning supplementary guidance, Version 1.0, Reference LIT 55303, July 2020
[8] Environment Agency (2020) Water Company Drought Plan guideline, December 2020 (Version 1.2).

    - Further optimise activities that reduce water losses
- Extreme pressure management (this could include further reducing pressure while still maintaining essential services, or night time reductions)
- District metering
- Removal of exceptions (in relation to any TUBs or NEUBs that are implemented)

Extreme supply side management actions

There are some potential extreme supply side management actions that may be considered during a drought to mitigate the need for rota-cuts in an emergency situation. Anglian Water is completing further consideration of such options to provide supply benefits before a Level of Service (LoS) 4 trigger is crossed. The actions summarised below are those which Anglian Water aim to develop further, in consultation with the Environment Agency and other stakeholders where appropriate. At present these include:

- Groundwater support actions
    - Lower borehole pumps or increase borehole depth
    - Satellite boreholes
    - Recommissioning out-of-service boreholes
    - Use of 3rd party boreholes
- River Support actions (emergency augmentation)
- Temporary treatment
    - UV disinfection
    - Nitrate removal and/or blending
    - Iron removal
- Desalination (mobile plants)
- Effluent re-use (diverting treated effluent so that it be partially re-abstracted or compensate a continued or enhanced abstraction)
- Overland pipes
- Tankering (movement of water via road tankers)
- Sea tankering (movement of potable water via food-grade sea tankers)
- Utilising other significant water bodies (potential to use 3rd party bodies of water)
- Supply schemes (Acceleration of the strategic grid scheme)
- Resource trading and transfers (short term trades between companies / sectors)

SEA Scoping Stage Results

The scoping stage of the SEA process sets the context and scope for the SEA and Environmental Report. The SEA Scoping Report was issued to the Consultation Bodies (Environment Agency, Natural England, and Historic England) on the 3 February2021 for a five-week statutory consultation period. A log of consultation comments and report updates is provided in Appendix C of the main Environmental Report. Issues raised by consultees have, therefore, been considered in preparing this report.

The scoping process identified the relevant plans and programmes at International, National, Regional, and Local level and their implications for the SEA and Drought Plan 2022. Scoping also set the environmental, social, and economic baseline context for the Anglian Water area, and identified key environmental and sustainability challenges and opportunities.

A key stage in the SEA process is the development of the SEA Framework which includes SEA objectives and indicators. The previous SEA Framework used in the 2019 SEA was reviewed and updated for Drought Plan 2022, allowing consideration of updated guidance. The overall principle of assessment is largely consistent with Drought Plan 2019 however the framework has been updated to include previously scoped out SEA topics such as Landscape and Visual Amenity and assesses positive and negative residual impacts independently.

The SEA objectives for the Drought Plan 2022 are provided in **Table 1** below:

Table 1 SEA Objectives for Drought Plan 2022

Topic	SEA objective
Biodiversity, fauna and flora	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services
	1.2 To maintain and where possible improve freshwater fisheries
	1.3 To avoid introducing or spreading INNS
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being
	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water
	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.
	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources
	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters
	4.3 To protect and enhance groundwater quantity and quality
	4.4 To promote measures to enable and sustain long term improvement in water efficiency.
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.
Air and Climate	6.1 To reduce greenhouse gas emissions
	6.2 To maintain and improve air quality
	6.3 To consider the need for adaptive measures for climate change
Archaeology and cultural heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest (such as heritage assets), and their settings.
Landscape and visual amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.

Options Assessment

The assessment approach follows a similar methodology used for the previous SEA of the Drought Plan 2019. The overall approach to the SEA is objective-led and the Drought Plan 2022 options have been assessed against the SEA objectives using the assessment questions developed as part of the SEA Framework.

The assessment was based on a qualitative six-point scale as presented in **Table 3** to describe the significance of effects.

Moderately and strongly positive and negative effects were considered to be environmentally 'significant', whereas neutral and slightly positive and negative effects were considered non-significant.

Table 3 Categorisation of Significance of Effects

Assessment Scale	Significance of Effect
+++	Major positive
++	Moderate positive
+	Slightly positive
	No effect identified
-	Slightly negative
--	Moderate negative
---	Major negative
0	Negligible

Assessment of the Drought Plan 2022 Options

Summary of Effects of Supply Side Management Options

The main issues which have been identified for the supply side management options are as follows:

- The impacts associated with summer drought permits tend to be more significant than if they were implemented during winter months.
- The majority of the adverse effects identified for the surface water intake options are secondary impacts and relate to reductions in water quality and flows associated with increased abstraction. Mitigation measures have potential to dampen effects.
- The River Colne Augmentation option has the most positive effects due to increased flows and water quality conditions during a drought, however, this may also induce some negative impacts on biodiversity and fisheries objectives.
- The worst performing option is the River Wensum Costessey Groundwater Source option due to reductions in groundwater levels that could impact on habitat suitability for Desmoulin's whorl snail, increases in phosphorus concentrations, and reductions in water flow, which could affect site integrity and will not be compliant with the Conservation Objectives of the River Wensum SAC.

Summary of Effects of Extreme Supply Side and Demand Side Management Actions

Extreme supply / demand management actions, also referred to as 'more before 4' actions, during a drought to mitigate the need for rota-cuts in an emergency situation. Anglian Water is completing further consideration of such options to provide supply benefits before a Level of Service (LoS) 4 trigger is crossed. At present these options are theoretical only and therefore it is not possible to undertake a full SEA assessment of these actions.

Summary of Effects of Demand Management Options

Overall, demand side measures serve to reduce pressure on water resources by reducing customer demand for water, and therefore reducing abstraction at source. This will in turn contribute to reducing the amount of energy needed for water abstraction, treatment and distribution. The demand side options perform relatively well against the SEA objectives with many of the options scoring slightly positive effects such as maintaining surface and groundwater flows and promoting efficient and sustainable use of water. Emergency Drought Orders (rota cuts) had the most significant negative effects, largely in relation to the impacts on population and human health, including potential drinking water quality issues, impacts on recreational assets and impacts on businesses and the economy. There is also the potential for the non-essential use ban to negatively affect certain types of businesses as well as recreation amenities and facilities. Negative effects for targeted leakage reduction include increased costs associated with finding and fixing leaks which may be passed on to the customer. Slight adverse effects may also be associated with emissions of air pollutants and greenhouse gas emissions from leakage reduction programme activities.

Summary of Cumulative Effects

An assessment of the potential cumulative effects of the Drought Plan 2022 has also been undertaken. This has included an assessment of the effects within the Drought Plan 2022 (between the Drought Plan 2022 options), and of the potential effects of the Drought Plan 2022 with other plans and programmes of particular relevance.

The cumulative assessment identified potential for cumulative effects for the Pitsford Reservoir and Rutland water options, which both abstract from the River Nene. It is considered that additive effects could occur if both options were deployed during the summer months. However, potentially affected abstractors are independent of each abstraction point and would not be subject to any cumulative effects. There are no pathways for additive effects between river flows and water quality. The impacts identified for winter permits do not share many common overlaps.

The assessment of the potential for cumulative impacts between the Drought Plan 2022 and other neighbouring water company Drought Plans, and the Anglian Water WRMP 2019, Anglian Water River Basin Management Plan and other relevant plans and programmes identified no specific pathways for cumulative impacts.

Mitigation and Monitoring

Mitigation has been integrated throughout both the Drought Plan 2022 and SEA processes. The SEA has only reported the likely residual environmental effects of the Drought Plan 2022 options following mitigation. The mitigation measures considered within the residual impacts include those that have been identified as part of the Environmental Assessments, and any additional mitigation that has been identified as part of the SEA option appraisals. The latter has been proposed where impacts may fall outside of the specific remit of the Environmental Assessments but is required to address any specific issues identified through the SEA process.

Provision for monitoring of the effects of Anglian Water's Drought Plan 2022 is provided for by an Environmental Monitoring Plan (EMP), which is appended to the Drought Plan 2022. This sets out the monitoring that has been proposed within the individual Environmental Assessment Reports.

The mitigation and monitoring measures outlined within the most recent Environmental Assessment Reports largely coincide with the recommendations within the SEA Environmental Report.

How Environmental Considerations influenced the development of the Drought Plan

Through the EARs, HRAs and SEA, a comprehensive set of mitigation measures and monitoring requirements have been set out to minimise effects on the environment and communities. However, as the majority of the options have been taken forward from the Drought Plan 2019 and were assessed through the 2019 SEA Environmental Report, there were limitations with regards to the extent that environmental considerations further influenced the development of the Drought Plan 2022.

A 'Post-Adoption' Statement accompanies the publication of the final Drought Plan 2022 which sets out how the SEA, and any views expressed by the consultation bodies or the public, influenced the final Drought Plan 2022.

Consultation

The SEA Environmental Report was published for public consultation alongside the draft Drought Plan 2022 on 8 June 2021 for an eight week period. Following consultation, the SEA Environmental Report has been updated to reflect consultation comments and any changes between the draft and final Drought Plan 2022. The Statement of Response outlines the changes made to the Drought Plan (and accompanying documents, including the SEA) as a result of the consultation.

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1 Introduction

1.1 Background and Purpose of Report

Anglian Water Services Limited (Anglian Water) has prepared its Statutory Drought Plan (the 'Drought Plan 2022') for 2022 and has undertaken a Strategic Environmental Assessment (SEA) of its Drought Plan. A Habitats Regulations Assessment (HRA) has been undertaken in parallel.

SEA is a statutory requirement for plans or programmes which could have significant environmental implications, and helps to identify where there are potential impacts and how any negative impacts might be mitigated. More information about SEA, and the rationale for applying it to the Drought Plan 2022, is provided in Section 1.2 below.

This Environmental Report is the second output of the SEA. In February 2021, a Scoping Report was issued for consultation[9] which summarised the baseline and framework that would be used for the assessment. Issues raised by consultees have been considered in preparing this Environmental Report (see Section 1.8 Consultation).

The Environmental Report presents the baseline information that sets the context for the assessment (Section 3) and provides details of the methods employed in undertaking the assessment (Section 4). The potential impacts of the various Drought Plan 2022 options are outlined in Section 5, with the impacts of the combinations of options included in the Drought Plan 2022 set out in Section 6. Information regarding mitigation and monitoring is provided in Section 7.

The SEA Environmental Report accompanies Anglian Water's submission of their Drought Plan 2022 to Defra. Section 1.8.3 provides details on how consultation was carried out on the Environmental Report.

1.2 Application of SEA to Drought Planning

1.2.1 Overview of Strategic Environmental Assessment

SEA is a statutory requirement under the Environmental Assessment of Plans and Programmes Regulations 2004 (referred to as the SEA Regulations)[10].

The objectives of SEA is to:

> '*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'.*

The SEA Regulations requires preparation of an Environmental Report in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and geographical scope of the plan or programme, are identified, described and evaluated.

[9] Ricardo (2021) Anglian Water Draft Drought Plan 2022 Strategic Environmental Assessment. Scoping Report. Prepared by Ricardo for Anglian Water Services Ltd. February 2021.
[10] The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No. 1633) apply to any plan or programme which relates solely or in part to England.

It should be noted, however, that as stated in the Office of the Deputy Prime Minister (ODPM) SEA Guidelines[11] *"It is not the purpose of the SEA to decide the alternative to be chosen for the plan or programme. This is the role of the decision-makers who have to make choices on the plan or programme to be adopted. The SEA simply provides information on the relative environmental performance of alternatives, and can make the decision-making process more transparent."* The SEA can, therefore, be used to support the timing, prioritisation and implementation of actions within the plan, although this needs to be set in the context of applying SEA to drought planning, as described in Section 1.2.2.

The range of issues to be included in an SEA is set out in the SEA Regulations, and includes biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, and landscape. As such, the full range of environmental and social effects which are likely to arise from implementation of the Drought Plan 2022 are considered

As identified above, the Government has produced SEA guidance[12], which sets out the stages of the SEA process. This, together with guidance for undertaking SEA of Drought Plans, which has been produced on behalf of United Kingdom Water Industry Research (UKWIR)[13], has been used to inform the methodology for the SEA. These documents provide the recommended best practice guidance for preparation SEAs of drought plans.

The Environment Agency's 2020 Drought Plan Guideline (DPG)[14] also includes guidance on the preparation of SEA of Drought Plans. This informs Anglian Water's Drought Plan 2022 and preparation of the SEA.

1.2.2 Applying Strategic Environmental Assessment to Drought Planning

Drought Plans encompass a group of measures that will only be implemented if and when required because of the unpredictable occurrence of a drought event, and thus the actual impact of the plan over its life is subject to very significant uncertainties. There may or may not be a drought during the period of the plan, and each drought is different in terms of severity, season, location, duration and influence of other abstractors within the catchment. Each combination of these factors may require a bespoke reaction in terms of measures.

It is impossible to predict in advance which and how many of the measures will be required, and in which order of priority, to respond to each particular drought event. Therefore, SEA of Drought Plans cannot provide a certain prediction of an overall environmental effect of adopting the plan, as its implementation is uncertain. However, for some resource zones with fewer drought options, it may be easier to predict which measures would be implemented in a drought scenario or it may be known that certain combinations would always be deployed simultaneously. The Environmental Report discusses these where relevant.

Instead of attempting to assess a number of potential scenarios, the SEA of Anglian Water's Drought Plan 2022 includes a cumulative effects assessment in order to ensure that options are not mutually exclusive, or that combinations would not cause significant adverse impacts.

[11] Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive.
[12] Office of the Deputy Prime Minister (2005). A Practical Guide to the Strategic Environmental Assessment Directive.
[13] UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (WR/02/S). Prepared by Ricardo Energy & Environment.
[14] Environment Agency (2020) Water Company Drought Plan Guideline, December 2020 (Version 1.1)

The SEA of Anglian Water's Drought Plan 2022 is also focussed on the reactive and transient nature of the event when a Drought Plan is operational, while maintaining the strategic approach of an SEA. For this, it is important to consider the relationship between the Water Resource Management Plans (WRMP) and the Drought Plan. The Environmental Report, baseline review and establishment of the SEA framework attempt to separate the key issues and assessment approaches relevant to the Drought Plan 2022 from those more applicable to the WRMP. The assessment of individual options (Stage B of the SEA process) concentrates on effects resulting from the implementation of drought management actions rather than the 'natural' impacts of drought.

1.2.3 Requirement for SEA and HRA of Anglian Water's Drought Plan

Undertaking a SEA of a Drought Plan helps guide decision making both in the preparation of the Drought Plan 2022 and during Drought Plan operation. For example, the SEA identifies the potential effects across a broad range of environmental topics which are focussed to the situation and established during the scoping phase. As every drought is different in terms of severity, location, duration and hence impact, the output of the SEA for each option will help guide option selection specific to the characteristics of any potential drought. The SEA also includes cumulative assessments to ensure that options are not mutually exclusive, or that combinations would not cause significant adverse impacts. This, therefore, informs decision making at Drought Plan development stage and ensures important strategic decisions are made early on in the process.

The SEA Scoping Report which was consulted on in February/March 2021 contained a description of the screening process. It concluded that SEA is required, taking into account a precautionary approach and uncertainties associated with whether it sets a framework for future development consent, and the unknown outcome of the Habitats Regulations Assessment screening (HRA) screening at that time. The HRA has since been undertaken, and is available in a separate report.

1.3 Anglian Water's Water Supply System and Drought Planning

1.3.1 Introduction

In the event of a severe drought, Anglian Water will need to carry out a range of management measures to ensure the provision of adequate supplies of wholesome water to its customers. The Anglian Water Drought Plan 2022 sets out the options for dealing with drought conditions, and takes account of recent legislative developments in drought management. Statutory demand management options available to water companies during drought have been extended through provisions in the Flood and Water Management Act 2010. Section 36 of this Act has amended the Water Industry Act 1991 provisions relating to hosepipe bans and allows companies to temporarily restrict a wider range of customer water use activities under a Temporary Use Ban without requiring a drought order. The Drought Direction 1991 was revoked and replaced by the Drought Direction 2011, which set out uses that still require a drought order in order to impose restrictions during a drought. This was updated by the Drought Plan (England) Direction 2020 which contains timeframes for submitting the draft Drought Plan to the Secretary of State for review.

1.3.2 Anglian Water: Water Resources and Supply System

Anglian Water is the largest water and wastewater company in England and Wales by geographic area and is divided into 28 Water Resource Zones[15] (WRZs) (see **Figure 1.1**) 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.

Anglian Water supply water and water recycling services to more than six million customers in the East of England and Hartlepool[16]. 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. Water supply is under pressure from population growth, climate change, sustainability reductions[17], and the need to increase resilience of water supplies to severe drought.

Figure 1.1 Anglian Water's Water Resource Zones

Source: Anglian Water, Water Resource Management Plan 2019

[15] 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'.

[16] Water Resources Management Plan (Anglian Water, 2019)

[17] 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.

1.4 Anglian Water Drought Planning Process

1.4.1 Overview and timetable

Water companies in England and Wales are required to prepare and maintain Statutory Drought Plans under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003 and in accordance with the Drought Plan Regulations 2005, the Drought Plan Direction 2020 and Environment Agency guidelines, i.e. the final water company guidance issued in December 2020[18]; and the draft supplementary guidance on environmental assessment which was issued in July 2020[19].

The Water Industry Act 1991 defines a Drought Plan as '*a plan for how the water undertaker will continue, during a period of drought, to discharge its duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders or drought permits*'.

On 1 October 2010, Section 76 of the Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010. The Water Use (Temporary Bans) Order 2010 also commenced on 1 October 2010 and provides definitions and clarifications on these activities.

The Drought Plan Direction 2020 states that all water company draft Drought Plans should be sent to the Secretary of State prior to consultation before 1 April 2021. Water companies must then publish their Drought Plan as directed by Defra. A revised (final) Drought Plan must be published at least every 5 years from the date the previous Drought Plan was published.

Anglian Water prepared a Draft Drought Plan in early 2019, which was an update of their Drought Plan 2014. After confirmation from the Secretary of State, Anglian Water published their Draft Drought Plan 2019 for public consultation. Anglian Water considered all representations in a revised draft Drought Plan 2019, which was published in June 2019. Following this the final version was published in June 2020.

Anglian Water has prepared the Drought Plan 2022, published in 2022, which encompasses the period 2022-2027.

Permission to abstract water, granted through licences issued by the Environment Agency and held and operated by Anglian Water, was subject to a 'Review of Consents' in accordance with Regulation 63 of the Conservation of Habitats and Species Regulations 2010 (as amended) (referred to as the Habitats Regulations). This Review of Consents was undertaken by the Environment Agency and included screening to determine a likely significant effect and Appropriate Assessment where likely significant effects are identified, to either affirm an abstraction licence or recommend action to amend the licence conditions. This was in order to ensure that the integrity of European sites is not at risk from the impacts of abstraction. Information provided by the outcomes of the Review of Consents was used to support the HRA screening of the Drought Plan 2022. HRA screening is being undertaken for all drought options to identify any requirements for Appropriate Assessment. This is being undertaken in parallel with the SEA.

Only those drought options which are relevant to the period encompassed by the Drought Plan 2022 (2022 to 2027) are considered in the SEA and HRA process. To this end, environmental effects of the Drought Plan 2022 options are considered within the context of the current licence operating conditions.

[18] Environment Agency (2020) Water Company Drought Plan guideline, December 2020 (Version 1.2)
[19] Environment Agency (2020) Environmental assessment for water company drought planning supplementary guidance, Version 1.0, Reference LIT 55303, July 2020

Potential new sources (which Anglian Water may bring on line in the future), new drought options, or revisions to existing options which are only envisaged to become operational post 2027 have, therefore, been excluded from the SEA and HRA screening process. The same approach has also been taken with respect to cumulative plans, projects and programmes, in that only those that are likely to be effective in the period to 2027 are considered in the SEA.

1.4.2 Anglian Water's Drought Actions

The Drought Plan 2022 is an update to the previous 2019 iteration. The Drought Plan 2022 will provide an account of how Anglian Water will ensure continued supply to customers when water resources may become depleted during periods of low rainfall.

The options cover three key drought management measures:

- Demand side management actions
- Supply side management actions (implemented through Drought Permits)
- Extreme supply and demand management actions (do not require Drought Permits)

Anglian Water proposals for managing water supplies during a drought follow a 'twin-track' approach. In the first instance, Anglian Water will seek to manage demands on water before using any available supply side measures[20].

The changes from the Drought Plan 2019 are presented in **Table 1.1**.

Table 1.1 Changes from Anglian Water's Drought Plan 2019

Drought Management Measures	Options the same as in Drought Plan 2019	Options changed since the Drought Plan 2019
General	The DP22 is based on a 1 in 200 year level of service. This is consistent with the DP19, and WRMP19.	
Demand side management actions	• Publicity campaigns • Meter optants • Leakage • Temporary water use (Hosepipe) bans • Non-essential use ban restrictions • Emergency Drought Orders (Severe Restrictions)	The following demand side management actions are included in DP22: • Communication campaigns and messaging* • Customer metering* • Water efficiency activities • Targeted leakage reduction* • Temporary Use Ban (TUBs)* • Non-essential Use Ban (NEUBs)* • Emergency drought orders* *These options were included in DP19 but the descriptions have been updated slightly.

[20] Supply side management actions are measures that may be taken to increase supplies of water during a drought, over and above ordinary activities

Drought Management Measures	Options the same as in Drought Plan 2019	Options changed since the Drought Plan 2019
Supply side management actions (implemented through Drought Permits)	• River Nene: Wansford Intake (Rutland Water) • River Nene: Dunston Mill Intake (Pitsford Reservoir) • Wellington Wellfield: Stoke Ferry Intake • River Colne Augmentation (Ardleigh Reservoir) • River Wensum: Costessey Boreholes • Great Ouse: Offord Intake (Grafham Water) • River Trent: Newton-on-Trent Abstraction (Hall Water Treatment Works)	• River Gipping: Sproughton Intake (Alton Water) – option removed
Extreme supply and demand management actions (do not require Drought Permits)	• Management of inter-company transfers • Road tankering of water to areas where supplies are low • Desalination of brackish water • Return of effluent to different discharge points on rivers to supplement river flows and allow increased abstraction • Transfers of water from one river catchment to another, to supplement flows for abstraction • Bulk transfers of water from other water companies	• Anglian Water is completing further consideration of such options to provide supply benefits before a Level of Service (LoS) 4 trigger is crossed. At present these options are theoretical only.

The following sections describe the different demand and supply side options to be included in the Drought Plan 2022. These options are likely to be implemented in a phased approach according to need.

1.4.2.1 'Standard' demand side management actions

Anglian Water may introduce a number of 'standard' demand side measures during a period of drought. The Drought Plan 2022 includes six demand side management actions which were included in the Drought Plan 2019 and therefore considered in the previous SEA, plus one additional demand side management action (Water efficiency activities) which has been considered in the SEA for Drought Plan 2022. These are:

- Customer metering
- Targeted leakage reduction
- Communication campaigns and messaging
- Water efficiency activities
- Temporary water use (Hosepipe) bans (TUBs)
- Non-essential use bans (NEUBs)
- Emergency Drought Orders (Severe Restrictions)

1.4.2.2 Supply side management actions

The supply side options proposed within the Drought Plan 2022 are associated with the development of potential options to help improve outputs from existing water sources. Reservoir options seek to conserve or increase the amount of water stored (and therefore available for supply) during a drought period, and direct intakes seek to supplement water supply, and in some cases, to help conserve reservoir storage. Groundwater options seek to supplement water supply.

The supply side drought measures outlined in the Drought Plan 2022 will need to be implemented through Drought Permits. Under drought conditions, where a serious deficiency of supplies threatens to occur, or already exists, Anglian Water may require recourse to Drought Orders in order to increase supplies to manage the supply-demand balance. These are emergency options that would need to be further explored with the Environment Agency or neighbouring water companies to clarify the requirements for environmental assessment in advance of Drought Order application. Therefore, only Drought Permits, as identified in **Table 1.1**, have been assessed as part of the SEA screening.

For existing water sources, Drought Permits are used to increase the amount of water that can be abstracted to supplement supplies and, where possible, to conserve reservoir storage. Anglian Water may also apply for Drought Permits increase winter abstractions. If confirmed, Drought Permits may only be authorised for specified six-month (generally winter or summer) periods, subject to renewal only for further limited periods.

The Drought Plan 2022 includes seven supply side options that would require a Drought Permit. All options were included in the previous 2019 Drought Plan, and therefore considered in the previous SEA:

- River Wensum: Costessey Boreholes - Increasing the amount of abstraction permitted from groundwater sources at Costessey.
- River Nene: Wansford Intake (Rutland Water) - Changing the current conditions attached to the abstraction from the River Nene at Wansford, which would allow Anglian Water to take more of its licensed abstraction quantities. This will enable increased refilling of Rutland Water during a drought.
- River Nene: Duston Mill Intake (Pitsford Reservoir) - Changing the current conditions attached to the abstraction from the River Nene (at Duston Mill), which would allow Anglian Water to take more of its licensed abstraction quantities. This will enable increased refilling of Pitsford Reservoir during a drought.
- Great Ouse: Offord Intake (Grafham Water) - Changing the current conditions attached to the abstraction from the River Great Ouse, which would allow Anglian Water to take more of its licensed abstraction quantities. This will enable increased refilling of Grafham Water during a drought.
- Wellington Wellfield: Stoke Ferry Intake - Increasing the amount of abstraction permitted from groundwater sources at the Wellington Wellfield to reduce reliance on surface water intake.
- River Colne Augmentation (Ardleigh Reservoir) - Increasing abstraction from a groundwater source to supplement flows in the River Colne. This additional water would then be taken out of the river and used to refill Ardleigh Reservoir.
- River Trent: Newton-on-Trent Abstraction (Hall Water Treatment Works) – Temporarily reducing the hands-off flow (HOF), thereby allowing abstraction from the River Trent at Newton-on-Trent for Hall Water Treatment Works to continue in conditions below the current minimum permissible flow.

To support the Drought Plan 2022, individual environmental assessments were carried out for each of the potential Drought Permit options using a structured approach, as outlined in the supplementary

guidance[21] to the Environment Agency's Drought Plan Guideline[22], and to provide the information required in relation to monitoring and mitigation. These environmental assessments inform the SEA.

1.4.2.3 Extreme demand side management actions

There are some potential extreme demand side management options that may be considered during a drought to mitigate the need for rota-cuts in an emergency situation. Anglian Water will develop these options further to provide supply benefits before a Level of Service (LoS) 4 trigger is crossed. The options are detailed in Appendix 12 of Anglian Water's Drought Plan and include:

- Metering (smart)
  - Increase active smart meter reading (e.g. hourly)
  - Set specific targets for customers
- Metering (standard)
  - Ask customers to self-report how much water they are using
  - Ask our meter readers to increase data collection frequency
- Household incentivisation (financial rewards or lower tariffs for customers who reduce their water usage)
- Non-Household incentivisation (e.g. incentivise water efficiency schemes, night time tariffing schemes)
- Extreme communications plan (e.g. hard-hitting messages and images, keeping customers aware of current storage situation)
- Leakage
  - Focus resources on leakage prevention (e.g. invest in additional noise sensors to cover impacted areas)
  - Further optimise activities that reduce water losses
- Extreme pressure management (this could include further reducing pressure while still maintaining essential services, or night time reductions)
- District metering
- Removal of exceptions (in relation to any TUBs or NEUBs that are implemented)

1.4.2.4 Extreme supply side management actions

There are some potential extreme supply side management actions that may be considered during a drought to mitigate the need for rota-cuts in an emergency situation. Anglian Water is completing further consideration of such options to provide supply benefits before a Level of Service (LoS) 4 trigger is crossed. The actions summarised below are those which Anglian Water aim to develop further, in consultation with the Environment Agency and other stakeholders where appropriate. The options are detailed in Appendix 12 of Anglian Water's Drought Plan and include :

- Groundwater support actions
  - Lower borehole pumps or increase borehole depth
  - Satellite boreholes
  - Recommissioning out-of-service boreholes
  - Use of 3rd party boreholes
- River Support actions (emergency augmentation)

[21] Environment Agency (2020) Environmental assessment for water company drought planning supplementary guidance, Version 1.0, Reference LIT 55303, July 2020
[22] Environment Agency (2020) Water Company Drought Plan guideline, December 2020 (Version 1.2).

- Temporary treatment
    - UV disinfection
    - Nitrate removal and/or blending
    - Iron removal
- Desalination (mobile plants)
- Effluent re-use (diverting treated effluent so that it be partially re-abstracted or compensate a continued or enhanced abstraction)
- Overland pipes
- Tankering (movement of water via road tankers)
- Sea tankering (movement of potable water via food-grade sea tankers)
- Utilising other significant water bodies (potential to use 3rd party bodies of water)
- Supply schemes (Acceleration of the strategic grid scheme)
- Resource trading and transfers (short term trades between companies / sectors)

1.4.3 Definition of the SEA Study Area

To identify the study area of the SEA, Anglian Water's overall supply area was considered. However, this includes the Hartlepool RZ which does not contain any identified drought actions or measures and is geographically distinct from the other parts of the supply area. Therefore, it has been excluded from the SEA study area.

The proposed Drought Permit options can also extend beyond their immediate geographical boundary, making it appropriate to consider the wider area over which effects could occur. The map presented in **Figure 1.2** has been adapted from the previous SEA to include the additional River Trent Drought Permit option. It highlights that Drought Permit options at the River Wensum, River Great Ouse and on the River Colne have the potential to influence beyond Anglian Water's immediate supply area. These areas of potential influence extend along the River Yare to Great Yarmouth, along the River Great Ouse around St Ives and to the area east of the Colne Estuary. The SEA study area has therefore been extended accordingly, and these potential areas of influence have been taken into account in the collection of baseline data to inform the forthcoming environmental assessment of options.

The Drought Plan 2022 also contains other measures in addition to the Drought Permits which are proposed for inclusion in the SEA. These are currently theoretical but may include desalination, additional bulk transfers from outside the Anglian Water supply area and tankering amongst others. However, they are not included in **Figure 1.2** as these are broad theoretical options which have not been developed in detail, although they have been assessed as part of the SEA using the information available.

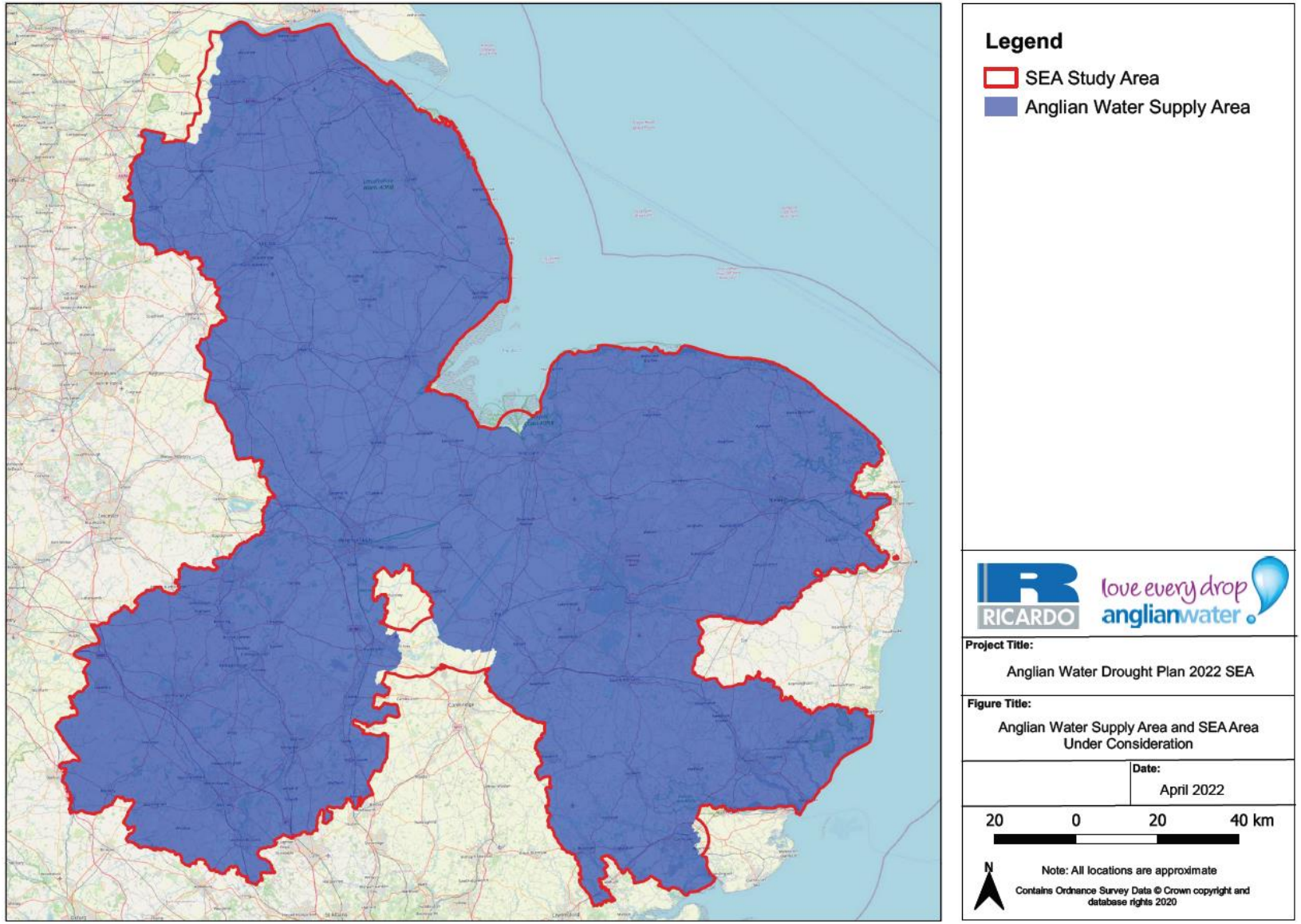

Figure 1.2 Extent of influence of supply side options and SEA Study Area

1.5 Drought Contingency Planning Environmental Assessments

Environmental Assessment Reports (EARs) have been prepared for the drought permits/order sites identified in **Section 1.4.2.2**, to support Anglian Water's Drought Plan 2022.

The aim of these studies was to produce environmental reports (EARs) that have been agreed with the Environment Agency and Natural England such that in the event of a drought, they are readily available for updating based on the prevailing drought situation at that time. The environmental studies consider all potentially affected habitats and species including, but not limited to, Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar features as well as any Site of Special Scientific Interest (SSSI) or species/habitats of principal importance for the conservation of biodiversity in England (identified in the Natural Environment and Rural Communities (NERC) Act 2006 Section 41) and local wildlife sites. The EAR also sets out the limits of the current data and also includes Environmental Monitoring Plan (EMP) recommendations for each drought permit/order site. These environmental studies, undertaken outside of an actual drought event, are intended to be used as the basis for the EAR to be prepared in support of a specific drought permit/order application, should the need arise.

Information from the assessments support this report and have been used to inform the SEA and HRA.

1.6 Stages of SEA Process

Table 1.2 is an extract from the Government's SEA guidance, the Practical Guide[23] that sets out the main stages of the SEA process and the purpose of each task within the process. This Scoping Report represents Stage A: Tasks A1 to A4 of the SEA process. Specific guidance on the application of the SEA process to Drought Plans is provided in a best practice publication by UKWIR (2021)[24].

Table 1.2 SEA Stages and Tasks

SEA Stages and Tasks	Purpose
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope	
Task A1. Identifying other relevant plans, programmes and environmental protection objectives	To establish how the plan or programme is affected by outside factors to suggest ideas for how any constraints can be addressed, and to help identify SEA objectives
Task A2. Collecting baseline information	To provide an evidence base for environmental problems, prediction of effects, and monitoring; to help in the development of SEA objectives
Task A3. Identifying environmental problems	To help focus the SEA and streamline the subsequent stages, including baseline information analysis, setting of the SEA objectives, prediction of effects and monitoring.
Task A4. Developing SEA Objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed.
Task A5. Consulting on the scope of the SEA	To ensure the SEA covers the likely significant environmental effects of the plan or programme.

[23] Office of the Deputy Prime Minister (2005). A Practical Guide to the Strategic Environmental Assessment Directive.
[24] UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (WR/02/S). Prepared by Ricardo Energy & Environment.

SEA Stages and Tasks	Purpose
Stage B: Developing and refining alternatives and assessing effects	
Task B1. Testing the plan or programme objectives against SEA objectives	To identify potential synergies or inconsistencies between the objectives of the plan or programme and the SEA objectives and help in developing alternatives.
Task B2. Developing strategic alternatives	To develop and refine strategic alternatives
Task B3. Predicting the effects of the plan or programme, including alternatives	To predict the significant environmental effects of the plan or programme and its alternatives
Task B4. Evaluating the effects of the plan or programme, including alternatives	To evaluate the predicted effects of the plan or programme and its alternatives and assist in the refinement of the plan or programme
Task B5. Mitigating adverse effects	To ensure that adverse effects are identified and potential mitigation measures are considered.
Task B6. Proposing measures to monitor the environmental effects of plan or programme implementation	To detail the means by which the environmental performance of the plan or programme can be assessed.
Stage C: Preparing the Environmental Report	
Task C1. Preparing the environmental report	To present the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision-makers.
Stage D: Consulting on the Draft Plan or programme and the Environmental Report	
Task D1. Consulting the public and consultation bodies on the draft plan or programme and the Environmental Report	To give the public and the consultation bodies an opportunity to express their opinions on the findings of the Environmental Report and to use it as a reference point in commenting on the plan or programme. To gather more information through the opinions and concerns of the public
Task D2. Assessing significant changes	To ensure that the environmental implications of any significant changes to the draft plan or programme at this stage are assessed and taken into account
Task D3. Making decisions and providing information	To provide information on how the Environmental Report and consultees opinions were taken into account in deciding the final form of the plan or programme to be adopted
Stage E: Monitoring the significant effects of the plan or programme on the environment	
Task E1. Developing aims and methods for monitoring	To track the environmental effects of the plan or programme to show whether they are as predicted; to help identify adverse effects
Task E2. Responding to adverse effects	To prepare for appropriate responses where adverse effects are identified.

1.7 Structure of Environmental Report

This SEA Environmental Report presents the findings of Tasks B1 to C1 set out in **Table 1.2** and provides the consultation bodies with an opportunity to express their opinions on the findings of the assessment.

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

Section 2 – Policy Context, provides a review of other policies, plans and programmes which influence the Drought Plan 2022.

Section 3 – Environmental Baseline Review, sets out the key environmental issues Anglian Water has considered in the SEA, drawing on information on the current state of the environment within Anglian Water's water supply area.

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

Section 5 – Assessment of Drought Options, presents the potential impacts of the various Drought Plan 2022 options against the SEA framework.

Section 6 – Cumulative Effects Assessment, discusses the potential in-combination impacts of drought options (intra-zone and inter-zone), demand management options and other plans and projects in the region.

Section 7 – Mitigation and Monitoring, discusses measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the Drought Plan 2022 and monitoring to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures.

1.8 Consultation

1.8.1 Overview

Consultation is an integral part of the SEA process. The SEA Regulations require that consultation is carried out early in the plan development process with the relevant consultation bodies, regarding the 'scope and level of information to be included within the Environmental Report'. In England the statutory consultation bodies are:

- Natural England
- The Environment Agency
- Historic England

Two opportunities are available for consultation bodies to be formally involved during the SEA process: during the scoping process; and at the environmental reporting stage. These are discussed below.

Following publication of the final Drought Plan 2022, Anglian Water will prepare an SEA Post-Adoption Statement setting out how the SEA and any views expressed by the consultation bodies or the public have influenced the Drought Plan 2022.

1.8.2 Consultation on the Scoping Report

Consultation bodies were invited to express their views on the Scoping Report and the scope of the SEA proposed in accordance with SEA Regulation 12(5).

The Scoping Report was issued on 3 February 2021 to the Environment Agency, Historic England and Natural England. The consultation period ran until 10 March 2021. The Statutory consultees were

invited to comment on the report and the proposed scope of the SEA. The responses received and how these have been addressed are presented in full in Appendix C.

1.8.3 Consultation on the Environmental Report

The SEA Directive and Regulations do not define a set timeframe for consultation on an Environmental Report. The SEA Directive states that Consultation Bodies and the public '*shall be given an early and effective opportunity within appropriate timeframes to express their opinion on the draft plan or programme and the accompanying environmental report before the adoption of the plan or programme or its submission to the legislative procedure'*.

The Environmental Report of the Drought Plan 2022 was produced in accordance with the approach agreed by Anglian Water and taking into consideration the responses received from consultation bodies in response to the Scoping consultation. It provided assessments of the likely significant effects of the drought options considered and selected by Anglian Water.

The Drought Plan 2022 and the SEA Environmental Report were issued to Defra in March 2021 and published on Anglian Water's website. An eight week public consultation was held between 8 June and 3 August 2021.

The statutory consultation bodies (Environment Agency, Natural England and Historic England), as well as the public, were invited to express their views on the Environmental Report and were able to use it as a reference point in expressing their views on Anglian Water's Drought Plan 2022.

A Statement of Response has been prepared which explains the changes Anglian Water will make to the Drought Plan (and accompanying documents, including the SEA) as a result of the consultation. Comments that were received through this consultation process have been taken into consideration in preparing subsequent updates to the SEA.

Following the publication of the Final Drought Plan 2022, Anglian Water will also publish a 'Post Adoption' Statement setting out how the SEA, and any views expressed by the consultation bodies or the public, influenced the Final Drought Plan 2022.

When the Drought Plan is implemented during an actual drought event, Anglian Water will monitor its effects on the environment and work with partners to deliver appropriate mitigation, to ensure that the potential impacts identified in the SEA are considered in practice.

2 Policy Context

2.1 Introduction

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

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

In accordance with the SEA Directive, a summary of the key policy messages from the review of relevant policies, plans and programmes is presented in Section 2.2 (full review is presented in **Appendix A)**. A summary of environmental baseline key issues is presented in Section 3 (full environmental baseline is presented in **Appendix B**).

2.2 Review of Policies, Plans and Programmes

One of the first steps in undertaking SEA is to identify other relevant policies, plans, programmes and environmental protection objectives. The review of these other plans sets out to establish how Anglian Waters DP might be affected by other plans, to identify other environmental protection objectives which the DP should consider and to help to identify the objectives for the SEA.

Potentially relevant plans and programmes were identified at the international, national, regional and local level. If the plan or programme does not have a significant effect on achieving the objectives of the DP or the DP does not have a significant effect on achieving the objectives of the other plan or programme, it was not included.

The full list of international, national, regional and local policies, plans, programmes and strategies reviewed and the key messages, targets and how they relate to SEA topics and SEA objectives are provided in **Appendix A**.

3 Environmental Baseline Review

3.1 Introduction

A fundamental component of the SEA process is to identify the current baseline conditions and how these might evolve. An awareness of existing conditions ensures that the impacts of the Drought Plan can be identified, mitigated and monitored.

The SEA Regulations requires that the evolution of baseline conditions of the plan area (that would take place with or without implementation of the plan) is determined. This is useful when identifying impact significance, particularly with regards to baseline conditions that may already be improving or worsening and the rate of such change.

Full environmental baseline data is presented in **Appendix B** and have been drawn from a variety of sources, including:

- Anglian Water Drought Plan 2019 – SEA Environmental Report[25]
- Office for National Statistics
- Multi-Agency Geographic Information for the Countryside (MAGIC) Interactive Mapping
- Environment Agency Catchment Explorer
- Natural England
- Historic England
- Plans and programmes reviewed as part of SEA process (**Table 3.1**)

This environmental baseline review also summarises the likely future trends for the environmental issues being considered (where information is available). The key issues arising from the review of baseline conditions are summarised in Section 3.4.

3.2 Limitations of the data and assumptions made

The Anglian Water supply area is large and covers a number of regions, which makes establishing a baseline at the sub-regional level challenging. There are also challenges around extrapolating information from data collated at differing spatial resolutions. Spatial data have been obtained for most of the SEA topics, and the baseline is presented graphically as mapped information where appropriate. In some instances, reporting cycles mean that available information is dated.

3.3 Overview

The Anglian Water supply area is approximately 22,000 km^2 and is bounded to the north by the Humber Estuary and extends west to Northampton and Milton Keynes. The East of England is the driest region in the UK with low rainfall and high evaporation losses. The region is designated by the Environment Agency as an area of serious water stress and opportunities for new water resources are limited. The region is predominantly agricultural and is a nationally important area for food production.

The Anglian Water SEA study area spans four NUTS (nomenclature of territorial units for statistics)[26] regions; the East of England, East Midlands, South East and Yorkshire and The Humber, however most

[25] Mott McDonald (2020) Anglian Water Drought Plan 2019, Strategic Environmental Assessment Addendum, Environmental Report. March 2020.
[26] In England, the region is the highest tier of sub-national division used by central Government. They are defined as first level NUTS regions ("NUTS 1 regions") within the European Union. Regional Government offices were abolished in 2011.

of the study area is contained within the first two. The baseline information has been presented at local, regional and national levels where possible for comparative reasons and to aid the assessment during Stage B of the SEA:

Local: The baseline within the Anglian Water supply area or within a specific WRZ. These data are usually sourced directly from Anglian Water. Spatial analysis also allows the presentation of data that lie within the Anglian Water supply area or scheme source area.

Regional: The baseline in the counties or regions that the Anglian Water supply region and scheme source areas cover. The Anglian RBMP is a valuable source of information that includes the Anglian Water supply region as well as the remainder of the SEA study area.

National: The baseline for the UK, England or in some cases the agglomerated baseline for the two main regions that the Anglian Water supply region intersects.

The baseline has been reviewed for each of the SEA topics, and is presented in full in **Appendix B**. Key issues identified from the baseline are presented in **Section 3.4**.

3.4 Summary of Key Issues

A summary of the key sustainability issues arising from the review of plans, policies and programmes and baseline are identified below in **Table 3.1** for the SEA.

Table 3.1 Summary of the key sustainability issues identified for the SEA

Topics	The key sustainability issues arising from the review of the plans, programmes and policies review and baseline
Biodiversity, flora and fauna	Plans, programmes and policies review: • Conservation and enhancement of the natural environment and of biodiversity, particularly internationally and nationally designated sites, whilst taking into account future climate change. • Promote a catchment-wide approach to water management to ensure better protection of biodiversity. • To achieve favourable condition for priority habitats and species, including UK NERC habitats and species. • Avoidance of activities likely to cause irreversible damage to nature conservation and natural heritage. • Support well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological networks, including provision for fish passage and connectivity for migratory/mobile species. • Strengthen the connections between people and nature and realise the value of biodiversity. • Protection, conservation and enhancement of natural capital. Ecosystem services from natural capital contributes to the economy and therefore should be protected and, where possible, enhanced. • To seek opportunities for biodiversity net gain from infrastructure development. • Avoidance of activities likely to increase the risk of spread of Invasive Non-Native Species (INNS). Baseline review: The Anglian region has a rich and diverse natural environment which is reflected in many of

Topics	The key sustainability issues arising from the review of the plans, programmes and policies review and baseline
	the designated sites of national and international importance contained in the region[27]. There are approximately 14 Special Protection Areas (SPA), 13 Ramsar sites, 15 Special Areas of Conservation (SAC), and 69 Sites of Specific Scientific Interest (SSSI) within 5km of the proposed Drought Plan 2022 options which have the potential to be affected. The study area supports a diverse range of aquatic species, many of which are afforded protection or are listed as being of conservation concern and are potentially vulnerable to changes in water levels and river flows.
Population and Human Health	Plans, programmes and policies review: • Water resources play an important role in supporting the health and recreational needs of local communities. Effective water resource management can create opportunities for regeneration, tourism and the wider economy. • The issue of water supply is becoming a development constraint in some areas, which is recognised as an issue in the National Planning Policy Framework. • To ensure all communities have a clean, safe and attractive environment in which people can take pride. • To ensure secure, safe, reliable, sustainable and affordable supplies of water are provided. • Increase awareness around the value and health benefits of water and encourage its sustainable use. Baseline review: The Anglian Water region has an approximate population of 7.1 million people[28] and is one of the fastest growing populations in the United Kingdom. Although a significant proportion of this growth can be attributed to natural increases, most is a result of migration into the region from the UK and overseas which has been driven by the region's proximity to London. The population is projected to grow by approximately 20% over the next 25 years. The Eastern region of England reports health which is slightly above the English nation in general whereas the East Midlands region is slightly worse. The East of England has the second highest employment and third highest gross disposable household income (GDHI) per head of any English region. Employment rates in the East Midlands is the fifth highest in the England and GDHI is the sixth highest. The East of England contributes to 8.6% of the UK's Gross Value Added (GVA) and the East Midlands contributes 5.7%.
Material Asset and Resource Use	Plans, programmes and policies review: • Promote sustainable management of natural resources, sustainable production and consumption whilst seeking to reduce the amount of waste generated by using materials, energy and water more efficiently. • Consider issues of water demand, water supply and water quality in the natural environment and ensure a sustainable use of water resources. • Contribute to a resource efficient, green and competitive low carbon economy. Maintain a reliable public water supply and ensure there is enough water for human uses, as well as providing an improved water environment. • Minimise the production of waste, ensure waste management is in line with the 'waste hierarchy', and eliminate waste sent to landfill.

[27] East of England Biodiversity Forum (2002) East of England Biodiversity Audit 2002, Page 16
[28] Defra, EA (2015) Part 1: Anglian river basin district river basin management plan, December 2015, Page 9

Topics	The key sustainability issues arising from the review of the plans, programmes and policies review and baseline
	• Promote the sustainable management of natural resources. Baseline review: Anglian Water operate 1,257 water and wastewater treatment works. Anglian Water has 112,833km of water and wastewater pipes supplying and transporting water across an area of 27,500km^2. Anglian Water achieved industry leading leakage performance of 182Ml/d in 2019/20 and plans to reduce this by 22% to 142 Ml/d by 2025. The water industry contributes to generation of waste through construction of new infrastructure. There is an ongoing need for society to reduce the amount of waste generated through the 'waste-hierarchy' best practice.
Water	Plans, programmes and policies review: • Promote sustainable water resource management, including a reduction in water consumption • Maintain and improve water quality (surface waters, groundwater and bathing waters) • Expanding the scope of water protection to all waters, surface waters and groundwater • Improve the quality of the water environment and the ecology which it supports, and continue to provide high levels of drinking water quality • Ensure appropriate management of abstractions and protect flow and level variability across the full range of regimes from low to high conditions • Prevent deterioration of WFD waterbody status • Balance the abstraction of water for supply with the other functions and services the water environment performs or provides. • Steer new development to areas with the lowest probability of flooding and manage any residual flood risk, taking account of the impacts of climate change. • Promote measures to enable and sustain long term improvements in water efficiency. • Ensure a sustainable balance between the supply and demand for water. • Encourage more efficient use of water and promote awareness of water sustainability. Baseline review: The Anglian Water region is the most water stressed in England and has the lowest precipitation[29]. This coupled with planned growth, increased water demand and climate change will place extra pressure on its already limited resources. The availability of water varies throughout the SEA study area. For the WFD waterbodies, the baseline does not provide details of all waterbodies within the Anglian Water supply area, instead it presents information for the specific waterbodies that were identified as being with the zone of hydrological influence for each of the options. The overall status varies for each of the waterbodies and ranges from 'Poor' to 'Good', however the majority are classed as 'Moderate'. The Anglian Water area is one of the lowest lying and flat regions in the country and therefore coastal and river flood risk is a significant concern. The majority of the area is designated as Flood Zone 1, however there is a large area located within Flood Zone 3 around the Ely, South Fenland, Bourne and East Lincolnshire Water Resource Zones (WRZs) . There are also pockets of Flood Zone 2 across the Anglian Water area.

[29] Anglian Water, Our Company

Topics	The key sustainability issues arising from the review of the plans, programmes and policies review and baseline
Soil, Geology and Land Use	Plans, programmes and policies review: • Maintain the quality and diversity of geology and soils, which can be lost or damaged by insensitive development. • Ensure that 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. • Promote catchment-wide approach to land management by relevant stakeholders, in order to benefit natural resources, reduce pollution and develop resilience to climate change. • Promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions. • 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. Baseline review: The Anglian region predominantly consists of agricultural land, with over 50% used for agriculture and horticulture. The study area contains a significant amount of good quality agricultural land (78% at Grade 2 and above according to Agricultural Land Classification) with much of the soil is derived from silt and peat deposits, providing highly fertile soils, and resulting in some of the best and versatile agricultural land in England. Agriculture is an important activity in the region not only for land use, but also for the economy where cereals, rapeseed and sugar beet make up the majority of the arable crops grown. The region laso contains brownfield and contaminated land, which is derelict, vacant or is in use with the potential for redevelopment. There are around 180 Geological Conservation Review sites within the SEA study area, these sites are geologically important on a national and international level and are also designated as SSSIs.
Air and Climate	Plans, programmes and policies review: • Reduce greenhouse gas emissions. Targets include: bring UK's greenhouse gas emissions to net zero by 2050. • Reduce the effects of air pollution on ecosystems. • Improve overall air quality • Minimise energy consumption, support the use of sustainable/renewable energy and improve resilience to climate change. • Sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. • Build in adaption to climate change to future planning and consider the level of urgency of associated risks of climate change impacts accordingly. • Need for adaptive measures to respond to likely climate change impacts on water supply and demand. Baseline review:

Topics	The key sustainability issues arising from the review of the plans, programmes and policies review and baseline
	Current climate trends in England highlight that 2009-2018 was approximately 1°C warmer than the pre-industrial period (1850-1900). Over the past decade, UK summers and winters have been wetter by 11% and 4%, respectively. Much of eastern England receives less than 700mm rainfall per year and includes the driest areas in the country. Projected changes for the Anglian River Basin using the Met Office UK Climate Projections (UKCP18) indicates that by the 2050s, under the RCP8.5 scenario and on a 1981-2010 baseline, annual mean temperatures will increase by 2.4°C, however summer will see the highest increase at 3.0°C. Annual precipitation is projected to increase by 2.8%, however seasonal variations in precipitation rates are projected with a 11.7% increase in winter and a decrease of 24.8% during summer. Air quality in the region is generally good, although there are over 70 declared Air Quality Management Areas (AQMAs). Motor vehicles, particularly on heavily trafficked roads, are the main source of air emissions. However, agriculture also contributes to the local air quality, as a result of housed livestock and the spreading of slurries and manures. Trends in annual average emissions of nitrogen dioxide (NO2), sulphur dioxide (SO2) and particulate matter (PM10) show the East of England is on track to meet the UK Air Quality Strategy Targets.
Archaeology and Cultural Heritage	Plans, programmes and policies review: • Built development in the vicinity of historic buildings could have implications for the setting and/or built fabric. • Ensure active management of the Region's environmental and cultural assets. • Ensure effects resulting from changes to water level (surface or sub-surface) on all water dependent historical and cultural assets are avoided. • Promote the conservation and enhancement of the historic environment, including the promotion of heritage and landscape as central to the culture of the region and conserve and enhance distinctive characteristics of landscape and settlements. • Conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations. • Consider effects on important wetland areas with potential for paleo-environmental deposits. Baseline review: The numbers of listed buildings, scheduled monuments, registered parks and gardens, and conservation areas have been collected at a local authority level. *Within the Anglian Water SEA study area there are over 50,000 listed buildings, of which* 1,938 *are Grade I,* 3,169 *are Grade II*, and* 45,200 *are Grade II. There are 1,936 scheduled monuments, and 197 registered parks and gardens of which 17 are Grade I, 51 are Grade II*, and 129 are Grade III.* There are currently 5,097 designated assets on the Heritage at Risk register, including 391 sites in East of England and 447 sites in the East Midlands. Buried archaeology is particularly vulnerable to changes to water levels therefore specialist guidance and advice will be undertaken in areas with known, or potential, buried archaeology.

Topics	The key sustainability issues arising from the review of the plans, programmes and policies review and baseline
Landscape and Visual Amenity	Plans, programmes and policies review: • Protection and enhancement of urban and rural landscapes (including designated landscapes, landscape character and the countryside). • Abstraction and low river flows could negatively affect landscape and visual amenity. • Enhance the value of the countryside by protecting the natural environment for this and future generations • Take account of the different roles and character of different areas, promoting the vitality of main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it. • Ensure good access to valued areas of landscape character in sustainable ways to enhance its enjoyment and value by visitors and stakeholders. This includes protecting National trails and Public Rights of Way. Baseline review: There are five areas of outstanding natural beauty (AONB) in the study area including The Chilterns, Dedham Vale, Lincolnshire Wolds, Norfolk Coast, and Suffolk Coast and Heaths. The East of England is the arable agricultural core of England which dominates the rural landscape. The Anglian region has a diverse and contrasting landscape, including extensive flat, open spaces of intensive arable farming as well as the vast coastal areas, including Norfolk, Suffolk and Essex. There are 38 National Character Areas that intersect Anglian Water SEA study area, 14 of which are relevant to the Drought Plan 2022 options.
Inter-relationships	Baseline review: • The need to consider the inter-relationships between topics.

Key issues have been collated for each SEA topic below.

3.4.1 Biodiversity, Fauna and Flora Key Issues

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

- Protecting, conserving or enhancing biodiversity, particularly protected sites designated for nature conservation.
- Opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors.
- Slow/halt or reverse biodiversity losses and declines and avoid activities likely to cause irreversible damage to natural heritage.
- Protect fish populations and fisheries (freshwater and marine), linked with habitat quality and water quality.
- Recognise the importance of allowing wildlife to adapt to climate change.
- Integrate biodiversity considerations to new developments.
- 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.

3.4.2 Population and Human Health Key Issues

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

- The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliably public water supplies without the need for emergency drought measures.
- The need to accommodate an increasing population.
- Ensure water quantity and quality in rivers is maintained for a range of uses including tourism, recreation, navigation and use for agricultural and industrial purposes e.g. hydropower.
- Ensure supplies of water are reliable and affordable.
- Deliver sustainable development, recognising social, environmental and economic needs.
- Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and wellbeing and the economy.

3.4.3 Material Assets and Resource Use Key Issues

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 produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- The need to continue to reduce leakage from the water supply system to help reduce demand for water.
- Daily consumption of water is below the national average in the area, however, there is a continued need to encourage more efficient water use.

3.4.4 Water Key Issues

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

- Ensure the protection, improvement and sustainable use of all water bodies to meet society's needs for a resilient water supply, particularly in light of potential climate change impacts.
- Ensure the appropriate management of water during times of drought.
- Ensure the integration of water issues and biodiversity, recognising the links between the two.
- The need to further improve water quality of the region's river, estuarine and coastal waters, taking into account WFD objectives.
- The need to maintain the quantity and quality of groundwater sources, taking into account WFD objectives.
- Ensure that people understand the value of water.

3.4.5 Soil, Geology and Landscape Key Issues

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

- The need to protect and enhance geological features of importance (including geological SSSIs) and maintain and enhance soil function and health.
- The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).
- The need to protect and restore peatlands to reduce impacts of climate change.
- The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region.

3.4.6 Air and Climate Key Issues

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

- Comply with targets for reductions in greenhouse gas emissions and mitigate against climate change. Ensure resilience against the impacts of climate change through, for example, sustainable water resource management and water efficiency

3.4.7 Archaeology and Cultural Heritage Key Issues

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

- Encourage public awareness through promoting important heritage assets.
- The need to conserve sites of archaeological importance and cultural heritage interest, particularly those heritage assets which are sensitive to the water environment.

3.4.8 Landscape and Visual Amenity Key Issues

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

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

3.4.9 Inter-relationships

There are inter-relationships between the SEA topics and all objectives assessed during the SEA process. These include impacts of changes to water flows and quality on biodiversity, the economy, recreation, tourism, navigation, cultural heritage and landscape. Inter-relationships that result in changes to individual effects are considered by evaluation of synergistic effects throughout the assessment.

The key sustainability issue arising is:

- The need to consider the inter-relationships between topics.

4 Methodology

4.1 Introduction

This section describes the methodology that has been used to undertake the SEA of the drought options in Anglian Water's Drought Plan.

What the SEA Regulations require:

According to Regulation 12:

(2) The report shall identify, describe and evaluate the likely significant effects on the environment of –

(a) implementing the plan or programme; and,

(b) reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme

According to Schedule 2, The Environmental Report should include:

6. The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects and secondary, cumulative and synergistic effects.

8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.

4.2 Assessment Methodology and SEA Framework

This section outlines the assessments that have been carried out in the SEA to identify the environmental effects of the drought options listed in Anglian Water's Drought Plan 2022. The assessment approach followed for the previous SEA of Drought Plan 2019 has been reviewed and updated.

The supply side Drought Permit assessments undertaken for the previous SEA were reviewed based on the updated environmental assessments and HRAs (where relevant) for each of these options. The remaining demand management and additional supply side options assessment were reviewed based on updated baseline and key issues.

The environmental assessments of the drought options are 'objectives-led'. Establishing assessment objectives is a recognised way of considering the environmental effects of a plan and comparing the effects of alternatives. SEA objectives are often derived from environmental objectives established in law, policy or other plans and programmes, or from a review of baseline information and environmental problems (based on the SEA topics listed in Section 3.4).

An assessment framework of objectives has been developed based on:

- The current state of the environment in Anglian Water's water supply area (see Section 3.3).
- The key environmental issues identified (see Section 3.4).
- The key policy messages and environmental protection objectives identified in the review of policies, and other plans and programmes (see Section 2). It is important that the assessment takes these objectives into account as this will help it to highlight any area where the Drought Plan 2022 will help or hinder the achievement of the objectives of other plans (e.g. at local, national and international level – see review of Plans, Policies and Programmes in Section 2.2).

Final SEA objectives are set out in **Table 4.1**. alongside the key messages identified from the review of policies, plans and programmes and the key issues from the review of baseline information. The following sections describe how Anglian Water used these SEA objectives in the assessment of the environmental effects of the drought options. These SEA objectives are intended to reflect changes that contribute to sustainability. By assessing each drought option against the objectives, it is more apparent where drought options might have a negative impact, and where options could be developed to reduce potential impacts.

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

- Details of each potential drought management measure;
- Likelihood and predicted frequency of deployment of the measure;
- Construction (where applicable) and operational/implementation details;
- Relevant information contained in Environmental Assessment Reports (EARs) relating to drought permit options;
- Benefits to the water supply-demand position in a drought (taking uncertainty into account); and
- Key elements of the baseline environment, such as location of designated sites, priority habitats and species, landscape areas or heritage assets, recreational facilities and other environmental features.

Table 4.1 SEA Objectives and assessment approach

SEA Topic	Key Issues	SEA Objectives	Indicator Questions	Inter-relationships with other topics/issues
Biodiversity, flora and fauna	Protecting, conserving or enhancing biodiversity, particularly protected sites designated for nature conservation. Opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors. Slow/halt or reverse biodiversity losses and declines and avoid activities likely to cause irreversible damage to natural heritage. Protect fish populations and fisheries (freshwater and marine), linked with habitat quality and water quality. Recognise the importance of allowing wildlife to adapt to climate change. Integrate biodiversity considerations to new developments. 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,	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy	• Is the option likely to affect the conservation status of any SPA/SACs, Ramsar sites, SSSIs or locally designated sites? • Is the option likely to affect ancient woodland, BAP habitats and/or protected and BAP species? • Will the option affect any habitats that support legally protected species or species of conservation concern? • Is there potential for contribution to achieving 'favourable' conservation status or for creation of new BAP habitats? • Would the option protect and enhance aquatic and terrestrial habitats and species? • Will it affect WFD compliance e.g. good ecological potential/status? • Are there any opportunities for habitat creation or restoration? • Will it protect or enhance natural capital and ecosystem services? • 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?	Where there are water-dependent habitats, there are strong linkages between biodiversity and water (both quality and quantity
		1.2 To maintain and where possible improve freshwater fisheries	• Does the option location affect any important fisheries (salmonid or cyprinid)? • Are there potential indirect impacts (e.g. from affecting other aspects of aquatic ecology (habitat or food species) upon which fish rely)? • Are there opportunities to improve fish migration or could migration be impeded?	
		1.3 To avoid introducing or spreading INNS	• Will it limit, reduce or increase the risk of spread of Invasive Non-Native Species (INNS) or occurrence of algal blooms?	

SEA Topic	Key Issues	SEA Objectives	Indicator Questions	Inter-relationships with other topics/issues
	including through recognising the value of ecosystem services.			
Population and human health	The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures. The need to accommodate an increasing population. Ensure water quantity and quality in rivers is maintained for a range of uses including tourism, recreation, navigation and use for agricultural purposes. Ensure supplies of water are reliable and affordable. Deliver sustainable development, recognising social, environmental and economic needs Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and wellbeing and the economy.	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	• Is there potential for health and/or quality of life to be adversely or positively affected? • Will it help to protect or improve drinking water quality? • Will it raise awareness of the importance and value of the water environment for health and well-being?	• Where enhanced recreation/access there is potential for disturbance to ecosystems e.g. nesting birds
		2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	• Are there any pathways for effects on local businesses or other economic interests that rely on water and/or that may have licences connected to the water bodies affected? • Are there potential adverse or positive effects on tourism? • Will it help to ensure access to a secure and affordable supply of drinking water? • Will it assist in ensuring provision of essential infrastructure services to support a sustainable economy?	
		2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	• Will the option impact on any formal or informal recreational areas, parks, recreational facilities, and national trails/footpaths/access? • Are there opportunities to create new/additional recreational facilities, or potential to increase amenity/ access to riverside/countryside? • Will the use of rivers or other water bodies (e.g. reservoirs) for angling, birdwatching, water sports or navigation be affected?	

SEA Topic	Key Issues	SEA Objectives	Indicator Questions	Inter-relationships with other topics/issues
Material assets and resource use	The need to minimise the consumption of resources, including water and energy. The need to reduce the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill. The need to continue to reduce leakage from the water supply system to help reduce demand for water. Daily consumption of water is below the national average in the area, however , there is a continued need to encourage more efficient water use.	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill. 3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	• Will it help to minimise the demand for resources (including water)? • Will it minimise the use of energy and promote energy efficiency? • Will it make use of existing infrastructure? • Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? • Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? • Will it enable efficient water resource management and ensure maintenance of water supplies?	
Water	Ensure the protection, improvement and sustainable use of all water bodies to meet society's needs for a resilient water supply, particularly in light of potential climate change impacts. Ensure the appropriate management of water during times of drought. Ensure the integration of water issues and biodiversity, recognising the links between the two. The need to further improve water quality of the region's river, estuarine	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow, to maintain water supplies whilst protecting ecosystem functions that rely on water resources 4.2 To protect and where feasible enhance the quality of surface,	• Does the option take into account requirements for sustainability reductions, ALS assessments of water availability, and the sensitivity of surface and groundwater to abstraction? Will there be a conflict with any of these requirements? • Will it enable a sustainable use of water resources that balances demand for water with environmental protection? • Will it alter the flow or level regime or residence time of surface waters or groundwaters? • Is there potential to help ameliorate low flows? • Is the option likely to affect biological or chemical quality elements?	• Where there are water-dependent habitats, there are strong linkages with biodiversity objective

SEA Topic	Key Issues	SEA Objectives	Indicator Questions	Inter-relationships with other topics/issues
	and coastal waters, taking into account WFD objectives. The need to maintain the quantity and quality of groundwater sources, taking into account WFD objectives. Ensure that people understand the value of water.	transitional and coastal waters	• Would the option affect flow regimes or significantly change water levels? • Is there potential for physical effects on the river channel and/or hydromorphology of watercourse(s)? • Would the option help or conflict with meeting WFD objectives for preventing deterioration and achieving good ecological status? • For Heavily Modified water bodies, would the option contribute to or prevent the implementation of mitigation measures specified in the River Basin Management Plan? • Will it affect bathing water compliance?	
		4.3 To protect and enhance groundwater quantity and quality	• Is there the potential to affect groundwater quality (including contamination, saline intrusion etc)? • Would the option affect groundwater flows or significantly change groundwater levels? • Could the option have any other effects that could cause deterioration in groundwater status under the WFD? • Could the option contribute to meeting WFD status objectives for any groundwater bodies?	
		4.4 To promote measures to enable and sustain long term improvement in water efficiency.	• Will it encourage efficient water use? • Will it contribute towards improving the awareness of water sustainability and its true value?	
Soil, geology and land use	The need to protect geological features of importance (including geological SSSIs) and maintain and enhance soil function and health. The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	• Will it avoid damage to and protect geologically important sites? • Will it protect and enhance the quality of soils? • 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?	• Potential interrelationship between saline intrusion and soil quality • Potential land use implications for agri-environment schemes resulting in socio-economic consequences

SEA Topic	Key Issues	SEA Objectives	Indicator Questions	Inter-relationships with other topics/issues
	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, recognising the biodiversity value of some sites and need for a site-specific approach.			
Air and climate	Comply with targets for reductions in greenhouse gas emissions and mitigate against climate change. Ensure resilience against the impacts of climate change through, for example, sustainable water resource management and water efficiency. Recognising the relationship between peat soils and carbon.	6.1 To reduce greenhouse gas emissions 6.2 To maintain and improve air quality 6.3 To consider the need for adaptive measures for climate change	• Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions? • Is there potential to offset energy use or contribute to renewable energy generation? • Will it reduce or minimise air pollutant and greenhouse gas emissions? • Will it increase emissions to air in an area sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)? • Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? • Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	
Archaeology and cultural heritage	The need to conserve sites of archaeological importance and cultural heritage interest, particularly those which are sensitive to the water environment. Encourage public awareness through promoting important heritage sites.	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	• Could the option affect (directly or via their setting) any historic, cultural, and archaeological sites, e.g. Scheduled Ancient Monuments, listed buildings, Registered Parks and Gardens, Conservation Areas, historic landscapes? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits?	• Indirect relationship with population/human health and landscape

SEA Topic	Key Issues	SEA Objectives	Indicator Questions	Inter-relationships with other topics/issues
			• Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	
Landscape and visual amenity	The need to protect and improve the natural beauty of the region's AONBs and other areas of natural beauty.	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	• Will it avoid adverse effects and enhance designated landscapes? • 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 improve access to valued areas of landscape character?	

4.3 Primary Assessment

The appraisal framework set out in **Table 4.2** has been used to assess each of the drought options against the SEA objectives. The appraisal framework was applied to test the performance of the drought options against the SEA objectives. This assessment supported development of Anglian Water's Drought Plan 2022, and will inform the selection of options should a drought result in the Drought Plan 2022 becoming operational.

In the context of drought planning, individual drought options are taken to constitute alternatives. Anglian Water's Drought Plan 2022 comprises a total of 14 drought options (seven standard demand side actions and seven supply side options). Each of these 'alternatives' (individual drought options) were therefore assessed using the appraisal framework set out in **Table 4.2.** The assessment therefore provides information on the relative environmental performance of alternatives and is intended to make the decision-making process more transparent. The SEA can, therefore, be used to support the timing and implementation of drought options within the Drought Plan 2022. Further 'extreme' supply and demand management actions are possible; however, these options are largely generic at this stage and therefore have not been assessed against the SEA objectives.

The appraisal framework (**Table 4.2)** is structured as follows:

- The first and second columns of **Table 4.2** set out the SEA topics and objectives.
- The third column provides a brief commentary and evaluation of the impact of the drought option on the objectives for each topic, with reference to the key questions proposed in **Table 4.1**. This brief commentary assumes the implementation of best practice in implementing the option, therefore the effects are referred to as residual and are largely temporary. Potential mitigation measures for any identified adverse effects arising from each option are identified within the appraisal framework.
- The fourth column identifies the magnitude of the effect on a scale of low, medium and high.
- The value/sensitivity of the receptor(s) is identified in the fifth column on a scale of low, medium and high.
- The scale of the effect, which might relate to either geographical scale or the size of the population affected, is identified in the sixth column on a scale of small, medium to large.
- The impact evaluation includes consideration of the nature of the impact, certainty of effect, duration and permanence (seventh, eighth and ninth columns of **Table 4.2**) in compliance with criteria for determining the likely significance of effects specified in the SEA Directive Article 3(5) and Annex II, and the SEA Regulations Part 2, Regulation 9(2a) and Schedule 1. With respect to duration of temporary effects, short-term impacts are defined as those that last for up to six months, medium term impacts are those that extend for six months to two years whilst longer term temporary impacts are assessed as those that extend to two to five years. A 'significant long term' temporary impact category is used for those temporary effects that continue beyond five years in duration.
- The residual adverse and beneficial effects (after application of best practice approaches and any appropriate and explicit mitigation measures) are presented in the tenth and eleventh columns respectively. These are identified separately so as to avoid mixing adverse and beneficial effects, in line with SEA best practice.

Where qualitative and/or quantitative information is available for an option (e.g. as identified by an EAR etc.), this was used to inform the assessment.

As described in Section 1.5, EARs have been produced for the supply side drought permit options and these were used to inform the SEA for these options. The EARs define the significance of effects on identified sensitive features based on fragility of the receptors and the likely magnitude of impact experienced. The assessment of effects on water quality described in the EARs took into consideration the requirements of the WFD. Important information held within the EARs is borne out in the commentary of the assessment table if relevant, and the level of significance largely guided the SEA level of significance for the objectives that are informed by the EARs (see **Table 4.1**).

Objectives or key questions that are not supported by information presented in the EARs are evaluated using spatial analysis, professional judgement and appropriate guidelines.

Equally, where detailed environmental and socio-economic assessments of non-drought permit/order options were carried out (e.g. in relation to water use restrictions), these were also used to inform the SEA.

Table 4.2 Example of a SEA Appraisal Framework Table to be Completed for Each Drought Option

Topic	SEA objective	Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary	Magnitude of effect **(Low/ Medium/ High)**	Value/ sensitivity of receptor (Low/ Medium/ High)	Scale of effect: geographical &/or population affected (Small/ Medium/ Large)	Certainty of effect (Low/ Medium/ High)	Duration of effect **(short/ medium /long term)**	Permanence of effect (permanent/ temporary)	Residual Adverse Effect (likely to remain after reasonable mitigation)	Residual Beneficial Effect (likely to remain after reasonable mitigation)
Biodiversity, fauna and flora	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services									
	1.2 To maintain and where possible improve freshwater fisheries									
	1.3 To avoid introducing or spreading INNS									
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being									
	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water									
	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment									
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.									

Topic	SEA objective	Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary	Magnitude of effect **(Low/ Medium/ High)**	Value/ sensitivity of receptor (Low/ Medium/ High)	Scale of effect: geographical &/or population affected (Small/ Medium/ Large)	Certainty of effect (Low/ Medium/ High)	Duration of effect **(short/ medium /long term)**	Permanence of effect (permanent/ temporary)	Residual Adverse Effect (likely to remain after reasonable mitigation)	Residual Beneficial Effect (likely to remain after reasonable mitigation)
	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.									
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources									
	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters									
	4.3 To protect and enhance groundwater quantity and quality									
	4.4 To promote measures to enable and sustain long term improvement in water efficiency.									
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.									
Air and Climate	6.1 To reduce greenhouse gas emissions									
	6.2 To maintain and improve air quality									

Topic	SEA objective	Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary	Magnitude of effect **(Low/ Medium/ High)**	Value/ sensitivity of receptor (Low/ Medium/ High)	Scale of effect: geographical &/or population affected (Small/ Medium/ Large)	Certainty of effect (Low/ Medium/ High)	Duration of effect **(short/ medium /long term)**	Permanence of effect (permanent/ temporary)	Residual Adverse Effect (likely to remain after reasonable mitigation)	Residual Beneficial Effect (likely to remain after reasonable mitigation)
	6.3 To consider the need for adaptive measures for climate change									
Archaeology and cultural heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest (such as heritage assets), and their settings.									
Landscape and visual amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.									

For each SEA objective, a residual effects assessment is determined against a significance matrix which takes account of the value/sensitivity of the receptor and the magnitude of the assessed effect. The magnitude of effects are defined in **Table 4.3**.

Table 4.3 Defining Magnitude of Effects

Magnitude	Description of Effect
High	Adverse effects would result in the complete loss of the receptor and/or severe damage to its integrity/quality/key characteristics/features/elements. Effects would be one of the following: definite, long term, permanent, direct or irreversible.
	Beneficial effects would result in a large-scale improvement, enhancement or restoration of a receptor, large scale improvements to integrity/quality, or creation of a new internationally/nationally important resource. Effects would be one of the following: definite, long term, permanent, direct or irreversible.
Medium	Adverse effects would result in some loss of or damage to the receptor, but not sufficient to adversely affect its overall integrity. Partial loss of or damage to quality/key characteristics/ features/elements. Effects would be one of the following: definite, medium term, semi-permanent or temporary, direct or indirect or reversible.
	Beneficial effects would result in some improvement, enhancement or restoration of a receptor, improvements to integrity/quality, or creation of a new regionally important resource. Effects would be one of the following: definite, medium term, semi-permanent or temporary, direct or indirect or reversible.
Low	Adverse effects would result in some measurable change to the receptor and/or change in quality or alteration of one or more key characteristics/ features/elements. Effects would be one of the following: short term, temporary, direct or indirect.
	Beneficial effects would result in a small improvement to or addition of one or more key characteristics/ features/elements. Creation of a new locally important receptor/resource. Effects would be one of the following: short term, temporary, direct or indirect.

Source: Drought Plan 2014 SEA (Atkins, 2013)

This significance matrix (**Table 4.4**) comprises effects from ‘major beneficial’ to ‘major adverse’. Hatching has been added to the box signifying low magnitude and high receptor value/sensitivity as this could result in a greater than ‘moderate’ effects being assigned dependent on the sensitivity/value of the receptor. This colour coding is used to complete the columns for residual effects in the appraisal framework.

The resulting significance of effects is used in the prioritisation of options. Also, where major adverse effects are predicted, broad measures envisaged to prevent, reduce and as fully as possible offset these effects on the environment (as a result of implementing the DP) is outlined in the Environmental Report where relevant/appropriate. In some cases, the significance of impacts may not clear cut in each case, and professional judgement is used in some cases to determine overall significance.

Table 4.4 Significance matrix used to assess effects of each drought option on each SEA objective

Significance of Effect		Value/sensitivity of receptor: High (National /international/regional importance)	Medium (Sub-regional importance)	Low (Local importance)
Effect magnitude (includes scale of effect)	High	+++ / ---	+++ / ---	++ / --
	Medium	+++ / ---	++ / --	+ / -
	Low	= Significance of effect dependent on value/sensitivity of receptor and magnitude	+ / -	0

The definitions for 'significance' ratings as identified in the table above are provided below:

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

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

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

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

Example receptors for sensitivity are outlined below:

VERY HIGH sensitivity (National / international importance)
SPAs, SACs, Ramsar sites, Sites of Special Scientific Interest (SSSIs), AONBs, National Parks, Scheduled Monuments, World Heritage Sites, Grade I Listed Buildings, National Nature Reserves (NNRs), Section 41 habitats and species of principal importance.

HIGH sensitivity (Regional importance)
Regional Biodiversity Action Plan (BAP) habitats/ species, Regionally Important Geological Sites (RIGS), Water Framework Directive 'Good Ecological Status', National Trails, regionally important infrastructure.

MEDIUM sensitivity (Sub-regional importance)

Agricultural Land Classification, Heritage Coasts, Grade II Listed Buildings, historic landscapes, Environment Agency River Quality Objectives, Groundwater quality, Groundwater Source Protection Zones, angling, and navigable watercourses.

LOW sensitivity (Local importance)
Local nature conservation designations, Local BAP habitats and species, Special Landscape Areas, historic parks and gardens, Conservation Areas, local townscape and visual amenity, locally important infrastructure, major development allocations, Public Rights of Way.

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

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

All options– both supply-side measures and demand management measures – are assessed and to the same level of detail, in line with the SEA legislative requirements, national SEA guidance and the UKWIR SEA guidance. The level of detail for the environmental assessment of each measure is consistent with the strategic nature of SEA.

Table 4.5 Example SEA Appraisal Framework Summary

Option	*[name of option]*												
Summary commentary of scheme adverse effects	*[summary]*												
SEA objectives adverse effects summary	0	0	0	-	-	-	-	-	--	--	--	---	---
Summary commentary of scheme beneficial effects	*[summary]*												
SEA objectives beneficial effects summary	0	0	0	0	0	0	+	+	+	++	++	++	+++

An appraisal framework table (example provided in **Table 4.5**) has been completed for each drought option (as identified in Section 1) and presented in full in **Appendix D**. The summary of the assessment is presented in Section 5 as a colour-coded visual evaluation (VE) matrix. The VE matrix summarises the likely significance of impacts (which are discussed in full in the completed appraisal framework tables in **Appendix D**).

4.3.1 Mitigation Measures and Evaluation of Residual Effects

Mitigation measures were developed for the previous SEA where significant (i.e. moderate or major) adverse effects were identified. The mitigation measures were developed as part of the assessments of individual Drought Plan 2019 options, and followed a hierarchy of avoidance, reduction, or restoration/offsetting. The previous mitigation has been reviewed in light of the updated assessments. If required, additional mitigation measures is also recommended. The assessment also evaluates the significant effects following mitigation.

4.3.2 Cumulative effects

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

Because the combination of options that would be deployed in any one drought cannot be predetermined (see Section 1.4.2) a dedicated cumulative effects assessment in order to ensure that options are not mutually exclusive, or that combinations would not cause significant adverse impacts has been undertaken. This involved examining the likely significant effects of each of the drought options individually, in combination with each other, and in combination with the implementation of other plans and programmes. In assessing these effects, consideration has been given to other factors which may affect the receiving environment in the short, medium and long term.

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

1. Within Anglian Water's entire water supply area, assessment of cumulative impacts of each demand management drought option with every other demand management drought option. Note that demand management drought options are consistent across the whole of Anglian Water's region. Demand management measures serve to reduce pressure on water resources by reducing the demand for water. Therefore, demand management measures have not been assessed in detail against each supply side and drought permit/order option, other than to acknowledge that they will have a net positive effect by reducing pressure on water resources.
2. For each supply side option, assessment of the cumulative impacts of the option with Anglian Water's existing abstraction licences that operate within the zone of influence of the drought option.
3. For each supply side option, assessment of cumulative impacts with any other supply side option. Mutually exclusive options (e.g. those that draw upon the same resource or use the same site) have been identified.
4. Assessment of cumulative impacts of Anglian Water's Drought Plan 2022 with drought options included in the Canal and River Trust Drought Plans.
5. Assessment of cumulative impacts of Anglian Water's Drought Plan 2022 with drought options included in other neighbouring water company Drought Plans.
6. Assessment of cumulative impacts of Anglian Water's Drought Plan 2022 with other relevant policies and plans.

Neighbouring water companies have been invited to consult on the Drought Plan 2022 and Anglian Water will also communicate with neighbouring companies regarding the schemes in their respective plans. This enables potential effects with other plans to be identified, particularly in the context of spatial and temporal proximity. This is especially important in identifying potential water resources impacts, although licence changes would always be subject to further investigation by the companies themselves and the Environment Agency. Potential cumulative effects with wider plans were also assessed. If effects are identified they can be ameliorated with early stage mitigation and associated monitoring.

Drought Plans comprise a group of measures, the implementation of which are dependent on the particular drought conditions experienced and are subject to temporal, spatial and other factors. The exact timing of implementation of drought options will not be known until a drought is experienced. One of the limitations of the cumulative or in-combination assessment of Anglian Water's Drought Plan 2022 is that whilst an environmental appraisal of each drought option can be undertaken, the lack of predictability of which options will be implemented in any particular drought event means that it may be impossible to provide an accurate cumulative assessment of the impacts of the plan for a possible future drought event.

Cumulative assessments of drought options with each other have been undertaken assuming as a worst case that the operation of the two options could occur simultaneously. Spatial proximity and therefore potential impacts on a common receptor is the primary consideration (e.g. the same designated area or reach of river).

Due to the uncertainty of timing of implementation of drought options, assessment of each drought option with every other drought option has been undertaken with the intention that in the event of a drought, the findings of the SEA will be reviewed and a cumulative assessment made of the options proposed for implementation at that time, based on the findings of the one-on-one assessments presented in Sections 5.3 and 5.4.

4.4 Limitations of the Study

SEA is a high level assessment aimed at highlighting potential environmental concerns. The environmental data used in this assessment is based on that which is readily available from existing sources, e.g. statutory organisations, and environmental assessments of drought permit/order options already undertaken by Anglian Water. No primary research or survey work has been carried out specifically to inform the SEA and, therefore, it is possible that at the individual option level, there may be additional environmental issues that could have an influence on a drought option.

Limitations of the cumulative, or in-combination assessment of Anglian Water's Drought Plan 2022 should also be noted as discussed in Section 4.3.2, as implementation of drought options are dependent on the particular drought conditions experienced meaning that it may be impossible to provide an accurate cumulative assessment of the impacts of the plan for a possible future drought event.

It should be noted that the environmental assessment reports (EARs) which have been prepared for the drought permits/order sites to support Anglian Water's Drought Plan 2022 (see Section 1.5) have been undertaken in accordance with the Environment Agency Drought Plan Guidance. This states that the level of detail included in the EAR should be based on the level of risk posed by the action that is being assessed (e.g. based on the scale of the impact, the expected frequency of use or the importance or sensitivity of the site). The required level of assessment has been undertaken to help inform any potential residual effects of each drought option. The limitations of the data used for each assessment are discussed in the EARs.

The following information is incorporated from the EARs: impacts on environmental features such as NERC Species, designated sites, landscape and recreation; impact on hydrological flow and associated changes in geomorphological function and water quality. Where particular limitations or outstanding issues are known, these are briefly described in the SEA appraisal tables for the relevant drought option concerned.

5 Assessment of Drought Options

5.1 Drought Actions Under Consideration

Demand management schemes which have been assessed are common to all zones and are listed in **Table 1.1** and **Section 1.4.2.1**. Supply side and drought permit/order drought options which have been assessed for both WRZs are listed in **Table 1.1** and **Section 1.4.2.2**.

5.2 Assessment of Schemes Against SEA Objectives

Assessment of drought options has been carried out in accordance with the methodology described in **Section 4**. Appraisal framework assessment tables have been completed for each drought option, and are presented in full in **Appendix D**. **Appendix D** includes assessment tables for seven demand actions, and seven supply side management actions. The EARs for three drought permit options (River Great Ouse; River Nene (Pitsford) and Wellington Wellfield) identified dissimilar impacts for operation of a summer permit compared to a winter permit, therefore, two separate assessment tables have been produced for these options to distinguish between the impacts of a summer and winter permit.

A summary of the assessment is presented in this section as colour-coded VE matrices. For each drought option and each SEA topic and SEA objective listed in the left hand column of **Table 4.2**, the VE matrix summarises the likely significance of residual impacts. The colour coding represents a range from significant adverse impact in red through to significant beneficial impacts in dark green.

Legend

Assessment Scale	Significance of Effect
+++	Major positive
++	Moderate positive
+	Slightly positive
	No effect identified
-	Slightly negative
--	Moderate negative
---	Major negative
0	Negligible

5.3 ‘Standard’ Demand Side Management Actions

A visual summary of SEA conclusions for each of the demand side options in Anglian Water’s Drought Plan 2022 is provided in **Table 5.1.** The completed appraisal tables for each of the drought options are provided in **Appendix D**.

Overall, demand side measures serve to reduce pressure on water resources by reducing customer demand for water, and therefore reducing abstraction at source. This will in turn contribute to reducing the amount of energy needed for water abstraction, treatment and distribution. The demand side options

perform relatively well against the SEA objectives with many of the options scoring slightly positive effects such as maintaining surface and groundwater flows and promoting efficient and sustainable use of water. Emergency Drought Orders (rota cuts) had the most significant negative effects, largely in relation to the impacts on population and human health, including potential drinking water quality issues, impacts on recreational assets and impacts on businesses and the economy. There is also the potential for the non-essential use ban to negatively affect certain types of businesses as well as recreation amenities and facilities. Negative effects for targeted leakage reduction include increased costs associated with finding and fixing leaks which may be passed on to the customer. Slight adverse effects may also be associated with emissions of air pollutants and greenhouse gas emissions from leakage reduction programme activities.

Table 5.1 Visual Evaluation Matrix Summary for 'Standard' Demand Management Actions

Option		SEA Topics and Objectives																		Commentary
		Biodiversity, Flora and Fauna			Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
Customer Metering	Adverse				0										0	0				No major adverse effects have been identified. Negligible negative impacts have been identified where increased vehicle emissions may occur as a result of increased metering.
	Beneficial	+	+		+	+		+	+	+	+	+	++		+		+	0	0	Positive impacts include reducing the demand for water, resulting in securing the supply of water for customers/businesses. Reducing the demand for water will also have beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstractions and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.
Targeted Leakage Reduction	Adverse	0	0		0		0	0			0	0		0	-	-		0	0	Slight negative effects identified are associated with emissions to air (air pollutants and greenhouse gas emissions) as a result of construction activities and vehicle movements. All other negative effects identified are negligible.
	Beneficial	+	+		++	++		0		+	0	0			+		+			Slight to moderate positive effects have been identified with respect to sustainable provision of water through water savings that would have otherwise been lost to leakage after having been abstracted at source. These effects are generally considered to be long term and permanent in nature.
Communication campaigns and messaging	Adverse																			No negative impacts have been identified for this drought measure.
	Beneficial	+	+		+	+		+		+	+	+	+				+	0	0	Slight positive impacts includes reducing demand for water and securing essential supplies of water for customers/businesses. Reducing the demand for water will also have minor beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.
Water efficiency activities	Adverse																			No negative impacts have been identified for this drought measure.
	Beneficial	+	+		+	+		+	+	+	+	+	+				+	0	0	Slight positive impacts includes reducing demand for water and securing essential supplies of water for customers/businesses. Reducing the demand for water will also have minor beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.
Temporary use ban	Adverse					--	-											0	0	A moderate negative effect has been identified in terms of promoting a sustainable economy due to the effect of the ban on some businesses (e.g. landscaping/horticulture) that rely on domestic water-using appliances/uses (e.g. sprinklers/hosepipes).

Option		SEA Topics and Objectives																		Commentary
		Biodiversity, Flora and Fauna			Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	1.3	2.1	2.2	2.3	3.1	3,2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial	+	+		++			+		+	+	+	+				+	0	0	Moderate positive impacts include reducing the demand for water and securing supply of water for customers/businesses. Reducing the demand for water will also have slight positive effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.
Non-essential use ban	Adverse					---	--											0	0	Moderate to major negative effects associated with restriction of water use and impacts on recreation and tourism assets, the setting of heritage assets and local visual amenities. Restrictions of water use and impacts on businesses/economy could lead to major negative effects.
	Beneficial	+	+		++			+		+	+	+	+				+	0	0	Moderate positive effects as a result of maintenance of supply to consumers at times of drought. Minor positive effects in terms of the effects of reducing demand and improving the resilience of water supplies to drought, maintaining surface water and groundwater levels/flows and sustainable management of abstraction and supporting overall water efficiency.
Emergency Drought Orders (rota cuts)	Adverse				---	---	---										---			Significant major negative effects are predicted relating to the implementation of the emergency drought order with impacts for population and human health, including potential drinking water quality issues, impacts for water-dependent recreational assets and businesses/economy. An emergency drought order is not consistent with sustainable resource use or providing secure water supplies for people and businesses, and will cause significant disruption to domestic and commercial life. Other adverse effects include potential minor impacts on the setting of certain heritage assets and visual amenities.
	Beneficial	+	+		++			+		+	+	+	+					0	0	Moderate to slight positive effects include a reduction in the demand for water, maintenance of water flows/levels and maintenance of a water supply to consumers in an extreme drought.

5.4 Supply Side Management Actions

A visual summary of the findings of the SEA for each of the drought permit options is provided in **Table 5.2** The following subsections present these findings, indicating which options perform best across the SEA objectives. The completed appraisal tables for each of the drought options are provided in **Appendix D.**

5.4.1 Overall performance of options

The sections below provide a narrative summary of the results from the supply side management options. A summary of the assessment table is presented in **Table 5.2**. The main issues identified are as follows:

- The impacts associated with summer drought permits tend to be more significant than if they were implemented during winter months.
- The majority of the adverse effects identified for the surface water intake options are secondary impacts and relate to reductions in water quality and flows associated with increased abstraction. Mitigation measures have potential to dampen effects.
- The River Colne Augmentation option has the most positive effects due to increased flows and water quality conditions during a drought, however, this may also induce moderate negative impacts on biodiversity and fisheries objectives.
- The worst performing option is the River Wensum Costessey Groundwater Source option due to reductions in groundwater levels that could impact on habitat suitability for Desmoulin's whorl snail, increases in phosphorus concentrations, and reductions in water flow, which could affect site integrity and will not be compliant with the Conservation Objectives of the River Wensum SAC.

5.4.1.1 River Colne Augmentation (Ardleigh Reservoir)

The assessment identified that the River Colne Drought Permit will have slightly positive effects on fisheries due to increased flows and dilution capacity. Fish spawning will also be supported by augmented flows. There are moderate negative effects identified for biodiversity as increased flows and water levels may induce flushing and sedimentation of important habitats. There are no likely significant effects for internationally or nationally designated sites. There is no risk identified for risk of spread of INNS.

Communities and households are not expected to be affected by the Drought Permit. Moderate negative effects for other abstractors on the River Colne has been identified in the assessment as drought permit could create a small amount of drawdown in a localised area around the Lower Colne groundwater source. However, the Drought Permit may have slightly positive effects on recreation and amenity as opportunities for fishing, canoeing and rowing may be improved during periods of low flow.

The drought permit will have mixed negligible, slightly positive, and slightly negative effects on water resources. Slight positive effects will occur due to the augmentation from groundwater enabling greater dilution of nutrients and other pollutants, and slight negative effects due to a small reduction in groundwater resources within a localised area around the Colne. Other positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.

Negligible effects were identified for air and climate as there will be minor increases in energy use due to increased abstraction, however, no new infrastructure required from the drought permit.

Negligible effects were identified for the historic environment. There are numerous remains and features within the potential zone of influence, however there are no significant negative impacts on surface water or groundwater identified therefore those heritage assets along the River Colne are likely to be negligibly affected.

5.4.1.2 River Wensum: Costessey Groundwater Source

Major negative effects have been identified for biodiversity as a result of reduced flows and delays in groundwater recovery from increased abstractions resulting in loss or exposure of important habitats. There is potential for effects on the qualifying features of the Riven Wensum SAC/SSSI. A HRA Stage II Appropriate Assessment was therefore undertaken for the drought permit which concluded that with the inclusion of mitigation measures, uncertainty remained regarding the potential adverse effects on site integrity of the River Wensum (Costessey groundwater sources) on the River Wensum SAC and associated qualifying features. Following the collection of monitoring data and its analysis, the Stage 2 assessment will need to be revisited, to update the outcome and to provide confirmation on the appropriate mitigation measures that could reduce the potential for adverse effects. Moderate negative effects have also been identified for fisheries as a result of reduced flow which will result in altered habitat availability and may increase stress and competition among fish communities. There is no risk identified for risk of spread of INNS.

Populations or human health is not expected to be affected by the drought permit. The assessment identified moderate negative effects on the economy as other abstractions have the potential to be impacted. Recreation is likely to be affected due to reduced water levels in the Costessey Pits and Taverham Lake. Groundwater levels also have the potential to be slightly affected due to additional drawdown. The assessment identified slight negative effects for water quality and negligible impacts on soils and geology. Slight positive effects are associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.

Negligible effects were identified for air quality and climate change associated with minor additional energy requirements.

Negligible effects are anticipated for the historic environment. There are numerous remains and features within the potential zone of influence and there is also risk associated with further short-term drawdown or groundwater and river levels. However, this would already be in the context of already low river and groundwater levels due to prolonged low rainfall.

5.4.1.3 River Great Ouse: Intake (Grafham Water)

Moderate negative effects have been identified for biodiversity during a summer drought permit. The EAR found that there was potential for likely significant effects on the Ouse Washes SAC, SPA, and Ramsar as a result of water quality impacts, particularly during a summer Drought Permit. A HRA Stage 2: Appropriate Assessment was therefore undertaken which concluded that with robust monitoring protocol and mitigation measures, the drought permit would not result in an adverse effect on the integrity of European designated sites, either alone or in-combination with other drought options in AWS's DP22. The EAR also identified moderate effects on fisheries health, spawning and passage for the summer permit. Slight negative effects were identified for the winter permit for both biodiversity and fisheries as impacts are not expected to be as significant. There is no risk identified for risk of spread of INNS.

Communities and households are not expected to be affected by the drought permit. There is potential for slightly negative effects on the economy during a summer drought permit as reduced flow may mean

the demand for other abstractors cannot be met. There are not anticipated to be any effects on other abstractors during a winter permit. Recreation will likely have slight negative effects during winter months due to the predicted impact on fisheries. However, effects during summer are anticipated to be moderate negative due to increased use coinciding with risk of algal blooms and limitation of boat movements.

Moderate negative effects on water resources have been identified for a summer permit whereas effects during winter impacts would be slight. The impacts on flows from Stage 2 of the drought permit are considered to be more severe than those proposed for Stage 1. It is not expected that either Stage of the proposed drought permit would permanently affect the overall status of the River Great Ouse at Offord through a change in flows. There are also likely to be more significant negative effects on water quality during a summer drought due to increased orthophosphate concentrations. However, there is potential to reduce water quality issues and algal blooms at Grafham Water by maintaining water levels. There are no effects identified for groundwater.

Negligible effects were identified for climate change as there is no new infrastructure required from the either the summer or winter drought permit but there may be additional energy requirements from increased abstraction, however these will be minimal.

Negligible effects were identified for the historic environment for both the summer and winter Drought Permit. There are numerous remains and features within the potential zone of influence and there is also risk associated with drawdown of river levels. However, this would be in the context of already low river flows due to prolonged low rainfall.

5.4.1.4 River Nene: Intake (Pitsford Reservoir)

Moderate negative effects have been identified for biodiversity and fisheries for a summer drought permit due to deterioration in water quality. Fish spawning and passage may also be affected by a reduction in flows, particularly during summer months. Slightly negative effects were identified for biodiversity and fisheries during winter months as effects are anticipated to be less pronounced. There is no risk identified for risk of spread of INNS.

Communities and households are not expected to be affected by the drought permit. During a summer permit, the assessment identified slight negative effects on the economy as other abstractors have the potential to be impacted. Recreation will be affected during a summer permit due to increased risk of algal blooms. It is likely that there will be negligible effects for both the economy and recreation respectively during a winter permit.

The assessment also identified moderate negative effects for water resources and surface water quality during a summer permit. Capacity to dilute nutrients and pollution will be reduced during summer which could lead to algal blooms and DO sags therefore moderate negative effects have been identified. Surface water quality is likely to be slightly negatively affected during winter. However, slight positive effects have been identified as maintaining water levels at Pitsford Reservoir during a drought will reduce the risk of reduced water quality. No effects have been identified for groundwater quantity or quality. Slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.

Negligible negative effects were identified for air quality and climate change, for both summer and winter, as there is no new infrastructure required from the Drought Permit and additional energy requirements are considered to be minimal.

Negligible effects were identified for the historic environment for both the summer and winter Drought Permits. There are numerous remains and features within the potential zone of influence and there is also a key risk associated with further short-term drawdown in river levels. However, this would be in the context on already low flows due to prolonged low rainfall.

5.4.1.5 River Nene: Intake (Rutland Water)

Major negative effects have been identified for biodiversity as a result of major hydrological impacts and consequent water quality impacts in the River Nene, which has potential to significantly impact fish and macroinvertebrate communities as well as a number of NERC species. The EAR found that there was potential for likely significant effects on the Nene Washes SAC, SPA and Ramsar as a result of water quality impacts. A HRA Stage II Appropriate Assessment was therefore undertaken which concluded that with robust monitoring protocol and mitigation measures, the drought option would not result in an adverse effect on the integrity of European designated sites, either alone or in-combination with other drought options. The EAR identified major effects on fisheries health, spawning and passage. Moderate negative impacts on the risk of spread of INNS was identified, with the potential for Chinese Mitten Crab to move into other watercourses.

Communities and households are not expected to be affected by the drought permit. Moderate impacts were identified for the economy as other abstractors have the potential to be affected by the drought permit. Moderate effects are possible for recreation due to reduced water quality and increased risk of algal blooms which has potential to impact the aesthetic value of the river. Water levels should be maintained in the River Nene, therefore navigation is unlikely to be affected.

The assessment identified moderate negative impacts on water resources due to the reduced HOF and consequent increase in abstraction. There are likely to be mixed positive and negative effects on water quality as a result of the Drought Permit. The reduced flows in summer months and increased algal activity could reduce water quality. Maintaining water levels in Rutland Water during drought periods could reduce the risk of reduced water quality and algal blooms in the reservoir. However, during a drought this could be a challenge as water quality reduces as water quantity decreases. No impacts were identified for groundwater. Slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.

Negligible effects were identified for air quality and climate change as there is no new infrastructure required from the Drought Permit and additional energy requirements are considered minimal.

Negligible effects were identified for the historic environment for both the summer and winter Drought Permit. There are numerous remains and features within the potential zone of influence and there is also slight risk associated with the drawdown in river levels. However, this would be in the context of already low river flows due to prolonged low rainfall.

5.4.1.6 Wellington Wellfield: Intake

The assessment identified that changes to surface water quality, flow or levels as a result of the drought permit are expected to be low. No effects have therefore been identified for fisheries. Moderate negative impacts have been identified for a number of national and internationally designated sites with GWDTEs (Ground Water Dependant Terrestrial Ecosystems) as a result of ground water drawdown. Impacts may be greater in winter as ground water levels are already low at this point and further abstraction will restrict the ability of the lake features to be replenished. A HRA Stage II Appropriate Assessment was undertaken which concluded that with robust monitoring protocol and mitigation measures, the drought

option would not result in an adverse effect on the integrity of European designated sites, either alone or in-combination with other drought options.

Communities and households are not expected to be affected by the drought permit. Slight negative effects are predicted for the economy as five other groundwater abstractors could potentially be affected by the drawdown. As there are negligible changes to water levels, flows or quality anticipated, effects on navigation and recreation have been identified.

The assessment identified the drought permit will have slightly negative effects on water resources as additional pumping at Wellington Wellfield will result in additional drawdown in the groundwater body. Negligible effects were identified for surface water quality. Groundwater quality effects are not anticipated; however, the Drought Permit has the potential to have moderate negative effects on groundwater levels due to drawdown. The broad pattern of winter operation compared with summer operation is similar, but drawdowns are marginally lower in winter periods. The duration of the impacts is uncertain. Slight positive effects are associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.

Negligible effects were identified for air quality and climate change as there is no new infrastructure required from the drought permit and additional energy requirements are considered minimal.

Effects on the historic environment were assessed as negligible negative. There are numerous remains and features within the potential zone of influence, however there are no impacts on surface water identified therefore those along the River Wissey and River Little Ouse are likely to be negligibly affected. There are slight risks associated with the drawdown in groundwater levels on the historic environment as this could potentially affect heritage assets within the zone of influence, although this would be in the context of already low groundwater levels due to prolonged drought and has therefore been assessed as negligible negative.

5.4.1.7 River Trent: Abstraction (Hall WTW)

The EAR identified that the Humber Estuary SAC, SPA and Ramsar site is the only designated site within hydrological continuity. Negligible hydrological impacts were identified as a result of the permit, and therefore it is expected that the change in flows is unlikely to have an effect on the designated site, however following consultation with the Environment Agency the Humber Estuary designations were taken forward for features assessment. This included sea and river lamprey due to concerns over the sensitivity of lamprey species to passability at the upstream Cromwell weir. The assessment concluded that impacts on lamprey passability as a result of implementing the drought permit is unlikely. This is because fish tracking studies by researchers at Hull University show that the weir is passable only at very high flows, when the weir is drowned out. As the proposed abstraction will be occurring at medium to low flows, and using the evidence provided by the hydrological, water quality and geomorphology assessments, no impact to qualifying species of the Humber Estuary SAC/ Ramsar site are anticipated.

It is not likely that there will be a significant adverse effect on the macroinvertebrate, macrophyte and diatom populations of the River Trent downstream of Hall WTW abstraction point. It is not likely the reduced water levels and flows associated with the Drought Permit will affect the migration, spawning, entrainment or passability of salmon, river and sea lamprey, European eel or other fish species. No risks to spread of INNS has been identified. The DP22 HRA screening assessments concluded no LSEs for the drought permit, due to negligible impacts on downstream hydrology.

Communities and households are not expected to be affected by the drought permit. There have been no effects identified for the economy as downstream abstractors are not likely to be affected.

Negligible negative effects for water resources have been identified as although the abstraction does reduce levels in the vicinity of the abstraction point, and for some distance up and downstream, the effect is small. The temporary reduction in water flows or levels as a result of the Drought Permit is not expected to impact water quality, and there would be no abstraction at levels below the existing Hands-Off Level, therefore no effects on navigation and recreation have been identified. It also not expected the Drought Permit will result in any changes to salinity, DO concentration or temperature of the River Trent downstream of the abstraction point. Sensitivity testing was undertaken as part of the EARs process, which showed that reducing the boundaries for negligible hydrological impact assessment classification did not change the overall outcome of the assessment. No effects have been identified for groundwater resources.

Negligible effects were identified for air quality and climate change as there is no new infrastructure required from the drought permit and additional energy requirements are considered minimal. Negligible effects were identified for the historic environment.

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Table 5.2 Visual Evaluation Matrix Summary for Supply Side Management Actions

Option		SEA Topics and Objectives																	Commentary
		Biodiversity, Flora and Fauna			Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
River Colne Augmentation (Ardleigh Reservoir)	Adverse	--	--			--	0	0			-	-		0	0	-		0		Moderate negative effects on biodiversity and fisheries with regards to impacts on NERC species (bullhead and European eel) and fish communities as a result of increased flows and water levels resulting in flushing and sedimentation of important habitats (e.g. spawning). Moderate impacts on businesses and local economy due to groundwater drawdown potentially impacting a number of abstractors in the zone of influence (including abstractions for industry and agriculture). Slight negative effects elsewhere on surface and groundwater quality as well as air quality due to the increased emissions from additional abstraction and the close proximity of a number of AQMAs.
	Beneficial	+	+				+		+	0	+			0			+		0	Slight positive effects associated with increased flows in the River Colne resulting in increased availability of certain habitats, positive changes to fish communities, opportunities for recreation and dilution of water pollution. Other positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.
River Wensum (Costessey Groundwater Source	Adverse	--	--			--	-	0		-	-	-		0	0	0		0		Major - moderate negative effects on biodiversity, specifically impacts on qualifying features of River Wensum SAC/SSSI (Desmoulin's whorl snail). Moderate negative effects, such as loss of important habitats due to reductions in flow and wetted width, on NERC and other notable species, including white clawed crayfish, bullhead, brook lamprey, brown trout and European eel. Moderate effects on various habitats including chalk river, lowland fen and lowland meadow as a result of delayed water recharge in connection with increased groundwater abstractions. Moderate impacts on businesses and local economy due to groundwater drawdown potentially impacting a number of abstractors in the zone of influence (including abstractions for agriculture). Slight negative effects elsewhere on surface and groundwater quality. These impacts apply to summer and winter drought permits, however, impacts may be exacerbated slightly during summer due to lower residual flow.
	Beneficial	0							+								+			Slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.
River Great Ouse: Offord Intake (Grafham Water) - WINTER	Adverse	-	-				-	0		--	-			0	0	0		0		Moderate negative effects on flows due to potential for deterioration in WFD status. Slight negative effects on water quality which may cause potential LSEs on qualifying features of the Ouse Washes SPA/SAC/Ramsar. HRA concluded no adverse effects on this designated site id appropriate monitoring and mitigation is implemented. Slight negative effects on biodiversity as a result of moderate impacts on NERC and notable species and habitats and a number of Local Wildlife Sites due to reductions in flow and wetted width.
	Beneficial								+		+						+			Slight positive effects on water quality in Grafham Water due to maintained water levels during drought and reduced risk of water quality deterioration and algal blooms in the reservoir. Additional slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity, Flora and Fauna			Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	1.3	2.1	2.2	2.3	3.1	3,2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
River Great Ouse: Offord Intake (Grafham Water) - SUMMER	Adverse	--	--			-	--	0		--	--			0	0	0		0		Moderate negative effects on flows due to potential for deterioration in WFD status. Moderate negative effects on water quality which may cause potential LSEs on qualifying features of the Ouse Washes SPA/SAC/Ramsar. HRA concluded no adverse effects on this designated site if appropriate monitoring and mitigation is implemented. Moderate negative effects on biodiversity as a result of significant impacts on NERC and notable species and moderate impacts on a various habitats and number of Local Wildlife Sites due to reductions in flow and wetted width.
	Beneficial								+		+						+			Slight positive effects on water quality in Grafham Water due to maintained water levels during drought and reduced risk of water quality deterioration and algal blooms in the reservoir. Additional slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.
River Nene: Intake (Pitsford Water) WINTER	Adverse	-	-	-		0	0	0		-	-			0	0	0		0		Slight adverse effects on surface flows in the River Nene, leading to reductions in flow and wetted width potentially impacting impacts fish, macroinvertebrate, macrophyte and diatom communities. Other impacts for fisheries possible for NERC species spined loach and bullhead and also the biodiversity of a number of LNRs and LWS and potential increased risk of spreading the invasive non-native Chinese mitten crab.
	Beneficial								+		+						+			Slight positive effects on water quality of Pitsford reservoir through maintaining water levels during drought periods, which consequently have an incidental benefit of reducing the risk of reduced water quality and algal blooms in the reservoir. Slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.
River Nene: Intake (Pitsford Water) SUMMER	Adverse	--	--	0		-	-	0		--	--			0	0	0		0		Moderate adverse effects on surface flows in the River Nene, leading to reductions in flow and wetted width and deterioration in water quality will have major impacts on fish communities as well as significant impacts on NERC species spined loach, moderate impacts on bullhead and minor impacts on European eel. Moderate impacts are anticipated for macroinvertebrate, macrophyte and diatom communities as well as the biodiversity of a number of LNRs and LWS.
	Beneficial								+		+						+			Slight positive effects on water quality of Pitsford reservoir through maintaining water levels during drought periods, which consequently have an incidental benefit of reducing the risk of reduced water quality and algal blooms in the reservoir. Slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.
River Nene: Intake (Rutland Water)	Adverse	---	---	--		--	--			--	--			-	0	0		0		Major negative effects on surface flows and wetted width in the River Nene resulting in major risks to orthophosphate concentrations and siltation has the potential to cause significant impacts to biodiversity, namely fish and macroinvertebrate communities and a number of NERC and notable species (mostly fish species). Moderate negative impacts on INNS with the potential to increase the risk of spread of the Chinese Mitten Crab. Further moderate impacts on other abstractors, recreation and navigation are possible.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity, Flora and Fauna			Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	1.3	2.1	2.2	2.3	3.1	3,2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial								+		+						+			Slight positive effects on water quality of Rutland Water through maintaining water levels during drought periods, which consequently have an incidental benefit of reducing the risk of reduced water quality and algal blooms in the reservoir. Slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.
Wellington Wellfield: Intake	Adverse	--		-		-	0	0		-	0	--		0	0	0		0		Moderate negative effects on biodiversity with respect to GWDTEs, where impacts are greater in winter due to ground water levels are already fairly low and abstraction results in lake features being unable to replenish. Effects on INNS are uncertain but have been assessed as slight negative, monitoring is recommended to reduce uncertainty. Slight negative effects relating to ground water drawdown and potential impacts on other non-PWS abstractors which may result in negative impacts on businesses. Moderate negative effects for groundwater quantity as a result of increased abstraction, however the duration of impacts remains uncertain. The broad pattern of winter operation compared with summer operation is similar, but drawdowns are marginally lower in winter periods.
	Beneficial								+								+			Slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.
River Trent: Abstraction (Hall WTW)	Adverse	-	-					0		0	0			0	0	0		0		Slight negative effects have been assumed for biodiversity and fisheries as a result of the uncertainty surrounding current passability of Cromwell Weir. Further assessment is required to reduce the uncertainty around this assumption.
	Beneficial								+								+			Slight positive effects associated with the maintenance of essential public water supplies during times of drought, and improved resilience to drought effects.

5.5 'Extreme' Drought Management Actions

Extreme drought management actions have been considered by Anglian Water to mitigate the need for extreme restrictions (e.g. rota-cuts) in an emergency situation. These options consist of a suite of possible extreme demand- and/or supply-side actions that could be implemented during an extreme drought scenario. Examples of these actions are found in Sections 1.4.2.3 and 1.4.2.4 and further details are provided in Appendix 12 of the Drought Plan.

At present, these options are theoretical only and therefore it is not possible to undertake a full SEA of these actions. Anglian Water are able to identify potential droughts in their region at an early stage, this allows for significant planning and the ability to undertake full environmental assessment of any extreme supply or demand action before they would be implemented.

There are a number of likely benefits and impacts that could be associated with extreme demand actions. Benefits of increased smart metering include more data made available for reporting and trend spottling, including leakage detection, meanwhile, adverse impacts of this measure could include GDPR issues. Elsewhere, positive effects of incentivising water-efficiency schemes for non-households include less water being used overall, and more water being used during off peak periods and therefore reducing peaks of demand. Negative effects include not being able to enforce such measures and disrupting the non-household user process. Further, less water being used and returned to wastewater treatment works will also result in less water entering watercourses as effluent baseload.

Based on assessments for these types of options undertaken for the Drought Plan 2019, it is considered that the extreme management actions would perform relatively well against the SEA framework, with many slight positive impacts as a result of maintained water supply during a drought and negating the need to use surface water or aquifer sources. This would help to support 'natural flows' in rivers and reduce the need for abstraction, which also reduces the pressure on various environmental components. River support actions may also contribute to positive impacts.

However, there is also the potential for negative effects from these actions. Tankering water and overland pipes pose risks to the population as a result of added inconvenience, the possibility of facing further restrictions and disruption to the local economy and air and climatic impacts from increased vehicle movements. There is also the potential for moderate negative effects on climatic factors due to energy intensive processes for desalination and the return of tidal effluent. Desalination options also have the potential for negative effects on biodiversity and water quality through brine discharge. Other negative effects could occur from the introduction of water from different sources into surface water systems, potentially effecting surface water quality and biodiversity, flora and fauna.

5.6 Habitats Regulations Assessment Screening Report of Drought Plan Summary

Anglian Water has undertaken the first stage in the HRA process, Screening, on its Drought Plan 2022 options list. It has been carried out in parallel with the SEA and is reported separately in the HRA Screening Report. The HRA Stage 1 Screening concluded that the River Great Ouse (Offord Intake), River Nene (Wansford Intake/ Rutland Water), Costessey Boreholes, and the Wellington Wellfield and Denton Lodge (Stoke Ferry Intake) drought permits had potential to cause LSEs on European designated sites alone and they were taken through to Stage 2 Appropriate Assessment. A Stage 2 Appropriate Assessment was required to determine whether the drought permits would result in an adverse effect on site integrity of European designated sites, in light of conservation objectives. The Appropriate Assessment concluded that River Great Ouse (Offord Intake), River Nene (Wansford Intake/ Rutland Water) and Wellington Wellfield and Denton Lodge (Stoke Ferry Intake) will not result in adverse effects to site integrity due to the implementation of a monitoring and mitigation programme.

With the inclusion of mitigation measures, uncertainty remained regarding the potential adverse effects on site integrity of the River Wensum (Costessey groundwater sources) on the River Wensum SAC and associated qualifying features. Following the collection of data and its analysis, the Stage 2 assessment will need to be revisited, to update the outcome and to provide confirmation on the appropriate mitigation measures that could reduce the potential for adverse effects.

5.7 Summary

In general, the demand side options were found to have positive impacts on SEA objectives for population and human health and material assets and resource use. Adverse impacts have been identified with respect to other users where restrictions of water use are involved and also for cultural heritage and emissions.

Impacts on SEA objectives for drought permit/order options were mainly associated with impacts on surface waters and their ecology. Reductions in surface water levels also have the potential for adverse impacts on water quality, recreation and on landscape and visual amenity. The River Colne Augmentation option has the greatest positive effects due to increased flows and water quality conditions during a drought, however, this may also induce moderate negative impacts on biodiversity and fisheries objectives.

The assessment has found that negative effects typically relate to surface water flows and levels, water quality and biodiversity would be associated with these options. The majority of the adverse effects identified for the surface water intake options are secondary impacts and relate to reductions in water quality and flows associated with increased abstraction. Mitigation measures have potential to dampen effects. The worst performing option is the River Wensum Costessey Groundwater Source option due to reductions in groundwater levels that could impact on habitat suitability for Desmoulin's whorl snail, increases in phosphorus concentrations, and reductions in water flow, which could affect site integrity and will not be compliant with the Conservation Objectives of the River Wensum SAC.

6 Cumulative Assessment

6.1 Cumulative effects within the Drought Plan 2022

No significant cumulative effects have been identified between any of the demand management options, or between the demand management and supply side options proposed for inclusion within the Drought Plan 2022. The extreme supply side management actions have been excluded from the cumulative effects assessment at this stage as there are insufficient details on the location and scale of these options to enable a meaningful assessment to be made. As further information becomes available in the future these options can be assessed as part of future revisions to the Drought Plan.

The majority of the supply side actions assessed within the SEA are geographically distinct from each other and there are generally no overlaps between the identified zones of potential hydrological influence of each option. There are therefore limited pathways for cumulative effects between the supply side options. This is reflected in **Table 6.1**, which records no cumulative effects between any of these geographically distinct options.

Cumulative effects between Nene (Pitsford) and Nene (Rutland) drought options

The Pitsford Reservoir and Rutland Water options both abstract from the River Nene. Pitsford Reservoir intake is an abstraction point located on the River Nene upstream of the Wansford intake used to support Rutland. It was identified that implementation of the drought permit for Pitsford Reservoir would reduce flows in the River Nene between the Pitsford and Rutland intakes. However, inputs from the Great Billing water recycling centre (WRC), Broadhome WRC and Flag Fen WRC increase flows downstream of the abstraction point at Pitsford/Duston Mill intake. Additionally, tributaries between the Pitsford and Rutland abstractions assist in diluting nutrient concentrations in the River Nene. Therefore, it is not anticipated that these two options will have cumulative effects on the Nene Washes European Sites.

Both options share impacted reaches, therefore, it is considered that additive effects are possible if the drought options were deployed at the same time. The EAR for the Pitsford option identified minor hydrological and water quality impacts during winter only, meanwhile, the impacts for the Rutland drought option are major for winter. Therefore, there is potential for cumulative effects between the drought options, however, a post-drought analysis from the 2011-12 drought, when both the Pitsford permit and Rutland permit at Wansford were active, indicated that there were no in-combination environmental effects[30].

Potentially affected abstractors are independent of each abstraction point and would not be subject to any cumulative effects. Potential additive effects on navigation, amenity and angling from the two options could arise if these options are deployed together, as a much greater length of the River Nene would be affected and would limit the ability of recreational users to seek alternative locations on the river that were not affected by drought permits. However, at this stage, this is not considered sufficient to increase the overall effect from slight negative to moderate negative, as the river will still remain available as a recreational resource, albeit with a temporarily slightly reduced value.

[30] Atkins (2012). River Nene Winter Drought Permit Reviews – Wansford Intake (Rutland Water).

Additive impacts on the overall fisheries health of the River Nene also need to be considered. If both options are deployed together in the summer, the effects over a greater length of the River Nene could compromise the ability of the fish populations of the river to recover following a drought.

Table 6.1 Cumulative effects between Drought Plan 2022 options

	Customer metering	Targeted leakage reduction	Communications campaigns and messaging	Water efficiency activities	Temporary Use Bans	Non-Essential Use Bans	Emergency Drought Order (rota cuts)	River Colne Augmentation (Ardleigh Reservoir)	River Wensum: Costessey Groundwater Source	River Great Ouse: Intake (Grafham Water)	River Nene: Intake (Pitsford Reservoir)	River Nene: Intake (Rutland Water	Wellington Wellfield: Intake
Targeted leakage reduction													
Communications campaigns and messaging													
Water efficiency activities													
Temporary Use Bans													
Non-Essential Use Bans													
Emergency Drought Orders (rota cuts)													
River Colne Augmentation (Ardleigh Reservoir)													
River Wensum: Costessey Groundwater Source													
River Great Ouse: Intake (Grafham Water)													
River Nene: Intake (Pitsford Reservoir)													
River Nene: Intake (Rutland Water)													
Wellington Wellfield: Intake													
River Trent: Abstraction (Hall WTW)													
Drought options	Customer metering	Targeted leakage reduction	Communications campaigns and messaging	Water efficiency activities	Temporary Use Bans	Non-Essential Use Bans	Emergency Drought Order (rota cuts)	River Colne Augmentation (Ardleigh Reservoir)	River Wensum: Costessey Groundwater Source	River Great Ouse: Intake (Grafham Water)	River Nene: Intake (Pitsford Reservoir)	River Nene: Intake (Rutland Water	Wellington Wellfield: Intake

Source: Adapted from the Atkins (2013) SEA

6.2 Habitats Regulations Assessment Cumulative Assessment

Anglian Water has undertaken the first stage in the HRA process, Screening, on its Drought Plan 2022 options list. It has been carried out in parallel with the SEA and is reported separately in the HRA Screening Report. The screening stage establishes whether any schemes have the potential for a Likely Significant Effect (LSE) on the integrity of a European designated site. In-combination effects of Anglian Water's Drought Plan 2022 with its WRMP19, the Environment Agency's regional Drought Plans, and other water company WRMPs and Drought Plans, were not considered likely to have adverse effects on European designated sites. This assessment is based on information available at the time of writing.

6.3 Cumulative effects with existing relevant Programmes, Plans, Policies and Projects

6.3.1 Other water company Drought Plans

The following Drought Plans of neighbouring water companies have been reviewed in detail for potential cumulative impacts with Anglian Water's Drought Plan 2022:

- Affinity Water (Eastern Region)
- Cambridge Water
- Essex and Suffolk Water
- Thames Water
- Severn Trent Water

Affinity Water's 2019 Drought Management Plan identified 16 potential sources that have the capability for increased abstraction or reduction of river support under drought conditions. None of these sources coincide with those included in the Anglian Water Drought Plan 2022. Therefore, it is unlikely there will be any pathways for cumulative effects between the two Plans.

Cambridge Water Drought Plan 2018 does not propose any Drought Permits/Orders or temporary water transfers. However, they do include supply side options including the use of alternative sources than those normally used which includes the recommissioning of a groundwater source at St Ives. The intake option (Grafham Water) on the River Great Ouse is the closest to this within Anglian Water's Drought Plan 2022. Cambridge Water have not identified any environmental impacts. Therefore, it is unlikely there will be any pathways for cumulative effects.

Essex and Suffolk Water's draft Drought Plan 2018 has identified a potential reduction in baseflow and reduced water levels/flows in the River Gipping as part of the Redgrave Group Licence drought measure. Anglian Water's River Gipping Drought Permit option has been removed as part of the Drought Plan 2022 update therefore there are no potential pathways identified for cumulative effects between the two Plans.

Cumulative effects have not been identified between Thames Water's Drought Plan 2017 and Anglian Water's Drought Plan 2022. The options included within Thames Water's Drought Plan are geographically distinct from Anglian Water's options. There are no options included within the same surface water catchment or groundwater body.

Severn Trent Water draft Drought Plan 2018 is not likely to have any cumulative effects with Anglian Water's Drought Plan 2019. The SEA of Severn Trent's draft Drought Plan 2018 states that Anglian

Water and Severn Trent have a bulk supply agreement which provides up to 18Ml/d to rural Rutland. However, this does not automatically vary with any drought management measures, and the agreement does not stipulate that Severn Trent Water will require Anglian Water have to impose any water use restrictions on its customers that are supplied by this bulk water supply. During drought condition, close liaison between the two companies will be required.

6.3.2 Water Resource Management Plans

6.3.2.1 Anglian Water's Water Resource Management Plan 2019

The SEA of the WRMP 2019 has been reviewed to determine whether there are any cumulative effects between the options proposed in the two Plans. The WRMP 2019 proposes supply side options including new transfers, desalination and resilience options some of which are located in the five Water RZ covered by the Drought Permit options in the Drought Plan 2022.

There have been no negative environmental impacts identified for the transfer pipelines and resilience options proposed in the WRMP 2019. It is therefore unlikely that there will be pathways for cumulative effects between the options proposed in the two Plans.

In the East Suffolk RZ, a desalination option is proposed at Felixstowe. The WRMP identified negative effects on WFD status and ecology. It is unlikely that there will be cumulative effects between Felixstowe Desalination and the River Colne Drought Permit option as they are geographically distinct.

Overall, no potential cumulative impacts have been identified between Anglian Water's Drought Plan 2022 and the WRMP 2019.

6.3.2.2 Other water company Water Resource Management Plans

A review of the latest WRMPs from neighbouring water companies was undertaken and found no potential for cumulative effects.

6.4 Other Plans and Projects

6.4.1 Water Resources East

Water Resources East (WRE) recently published their Updated Resource Position Statement[31]. In this statement, WRE state that they are investigating a significant number of supply options within the region and opportunities for water transfer across regions. The draft Regional Plan was published in August 2021 and the potential for cumulative effects between this plan and Anglian Water's Drought Plan 2022 will be reviewed during the next update.

6.4.2 Anglian River Basin Management Plan (RBMP)

Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in the River Basin Management Plans has been undertaken.

The information used to carry out these assessments is considered to be the most up to date information available at the time of writing, but the assessments should be reviewed at the time of drought option

[31] Water Resources East (WRE) Updated Resources Position Statement

implementation to ensure that no changes to the River Basin Management Plans have been made in the intervening period, and that the assessment, therefore, remains valid.

The Anglian RBMP describes the planned steps to implement the measures required to achieve the environmental objectives of the Water Framework Directive (WFD). It provides the framework for protecting and enhancing the water environment. The SEA[32] of the Anglian RBMP determined that the plan was likely to have significant positive effects on the environment, particularly associated with measures to improve sustainability of agricultural management practices, addressing urban pollution and improvements to river corridors. Any local negative effects would expect to be mitigated during implementation. Therefore, there will be **no cumulative impacts** between the Anglian RBMP and the Anglian Water drought plan options.

The RBMPs, including the objectives and the measures they contain, are reviewed and updated every six years. The last updates were published in 2015, therefore, it is expected the Environment Agency will publish updated RBMPs in 2021, these should be considered for the next DP.

6.4.3 Canal and River Trust Drought Plans

The Canal and River Trust[33] (formerly British Waterways) is currently in the process of updating its internal Drought Plan. Their previous Drought Plan has not been published, therefore it is not possible to determine if there are any cumulative effects. Trust operates various navigable waterways and canals in the Anglian region. Liaison with the Trust about drought management actions would be useful in a drought as some of the Anglian Water drought permit options may have the potential for adverse impacts on river abstractions used to support some of the navigable waterways in the Anglian region.

6.4.4 Cumulative effects with any other identified relevant Plans or Policies

No cumulative effects are identified with other relevant existing plans and policies, including national policy statements, national or regional infrastructure plans or with local planning authority plans. Examples of those reviewed for cumulative effects include:

- National Policy Statement - Sizewell C
- A14 upgrade
- Cambridge-Milton Keynes-Oxford corridor
- East West Rail

[32] Environment Agency (2016) The River basin management plan for the Anglian River Basin District Strategic Environmental Assessment: Statement of Particulars Updated December 2015. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/496136/RBMP_SEA_Statement_Anglian_final_Jan_2016.pdf
[33] Canal and Rivers Trust Putting Water into Waterways Water Resources Strategy 2015-2020.

7 Mitigation and Monitoring

7.1 Overview

Key stages of the SEA process comprise Task B5: *Mitigating adverse effects*, Task B6: *Proposing measures to monitor the environmental effects of plan or programme implementation* and Stage E: *Monitoring the significant effects of the plan or programme on the environment* (see Section 1.6, Table 1.2).

The sections below describe how these tasks have been addressed and how Anglian Water intend to ensure that mitigation measures are implemented for any adverse effects that are identified and the means by which the environmental performance of the Drought Plan 2022 can be assessed.

7.2 Mitigation

'Mitigation measures' are measures to prevent, reduce or off-set significant adverse environmental effects that have been identified. In addition, it is important to consider measures aimed at enhancing positive effects.

Consideration of mitigation measures has been an integral part of the SEA process. The methodology for the assessment of the drought options is provided in Section 4. The SEA appraisals have been based on residual impacts, i.e. those impacts likely to remain after the implementation of reasonable mitigation. Certain assumptions have been made regarding this:

- Where suitable mitigation measures are known and identified (e.g. as informed through EARs, where available, or Anglian Water's Drought Plan 2022 Appendices 7-9), these have been taken into account, such that the resultant residual impact has been determined.
- In line with recommendations made in the UKWIR SEA Guidance[34] the SEA appraisals have assumed the implementation of reasonable mitigation, such as the use of good construction practice. This is particularly applicable to unused supply-side options which are currently non-commissioned and which do not operate as 'business as usual', and would require recommissioning in the event of use as a drought option.
- No mitigation is proposed for abstraction licences which are issued by the Environment Agency based on an assessment of the potential impacts on the environment. These licences already contain flow constraints at low flows or conditions associated with an operating agreement. This is applicable to all supply-side options which would operate with existing abstraction licence limits which have been subject to the Environment Agency's Review of Consents process.

Mitigation measures that have been identified through the combined Environmental Assessment and SEA process include:

- Publicity and extensive consultation in relation to the implementation of water restrictions, bans on use or Emergency Drought Orders

[34] UKWIR (2021) *Strategic Environmental Assessment and Habitats Regulations Assessment of Drought Plans* (UKWIR Project WR/02/S). Prepared by Ricardo Energy and Environment.

- Consultation with affected water users (particularly in relation to other abstractors) to determine how licences are used, associated conditions and potential impacts of specific drought options
- Reductions in abstraction rates at specific times to help support river flows for navigation
- Dredging and weed clearance to ensure navigation, amenity and angling interests are protected
- Where there are proposals for increased abstraction from surface water sources, use of variable abstraction rates, water level monitoring and ensuring free passage of spate flows through affected river systems will help to avoid stagnation of water
- Use of specific water quality measures such as introduction of temporary phosphate removal treatment
- To protect fish populations; over-pumping of additional water into isolated river channels, aeration of river reaches and fish rescues, as deemed appropriate
- Modifications to operating regimes of water level management or flood risk management structures, where appropriate, to help ensure that river flows are maintained
- Further consultation and liaison with the Environment Agency
- Provision of adequate treatment of any water which is to be transferred between catchments
- Provision of adequate treatment of effluent prior to its reintroduction to any surface water bodies
- Consultation with the Environment Agency regarding water quality requirements of transferred/ reused water or effluent
- Use of renewable or 'clean' energy sources for any options which have high energy demands
- Where archaeological remains are at risk due to water level changes measures set out in the Historic England 'Preserving Archaeological Remains' guidance (2016) should be implemented as appropriate.
- Surface and groundwater quality and water level monitoring

There are additional mitigation measures which have been recommended for the Drought Permit options. These are covered in more detail in the assessment tables in Appendix D and in the EARs and HRAs.

7.3 Monitoring

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

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

Anglian Water's Drought Plan 2022 includes a range of possible measures to allow Anglian Water to respond to a particular drought in the most appropriate way. It is impossible to predict in advance which and how many of the measures will be required, and in which order of priority, to respond to each particular drought event. Correspondingly, it is therefore difficult to prescribe monitoring for the effects of the Drought Plan 2022 as a whole, and more appropriate to consider monitoring for drought options with significant environmental effects should these options be implemented during an actual drought.

As described in Section 1.5, EARs have been prepared. The EARs include detailed Environmental Monitoring Plans (EMPs). A summary of the monitoring requirements can be found in Appendix 8. The Drought Plan Guidance requires the environmental assessment and EMPs to be updated regularly. The monitoring requirements will be assessed in more detail through this process. As described in the Drought Plan 2022, in the event of a drought requiring the implementation of drought option(s), Anglian

Water will review the requirement for environmental monitoring in consultation with the Environment Agency and Natural England.

Appendices

Appendix A Review of Plans and Programmes

Appendix B Environmental Baseline Review

Appendix C SEA Scoping Consultation Responses

Appendix D Assessment Tables

Appendix E Quality Assurance

Appendix A

A Review of Policy, Plans and Programmes

The findings of the review of policy, plans and programmes are set out in **Table A.1**. The purpose of the review and the key findings are set out in **Section 2.2** of the Environmental Report. This table sets out the purpose and objectives of the policy, plans and programmes, their potential relationship with Anglian Water's Drought Plan and the potential implications of the plan objectives for the objectives of the SEA.

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

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
International	
The Bern Convention (1979) *The Convention on the Conservation of European Wildlife and Natural Habitats*	
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 SEA should seek to promote the protection and enhancement of biodiversity.
The Bonn Convention (1983) *The Convention on the Conservation of Migratory Species of Wild Animals*	
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 implementation of the DP may influence biodiversity in the north west and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
The Paris Agreement (2016), Cancun Agreement (2011) and Kyoto Agreement (1997)	
The agreement 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 keep global temperature rise to below two degrees Celsius.	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.
Granada Convention (1985) *Convention for the Protection of the Architectural Heritage of Europe*	
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.
Valletta Convention (1992) *Convention on the Protection of Archaeological Heritage of Europe (revised)*	
The Valletta Convention is one of a series of Conventions for the protection of the cultural heritage produced by the Council of Europe over the last fifty years.	The SEA should take into account the need to conserve heritage.
Council of Europe (2003) *European Soils Charter*	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.
Council of Europe (2006), *European Landscape Convention*	
European Landscape Convention (ELC) is the first international convention to focus specifically on landscape. Natural England implements the European Landscape Convention in England. The aims of the 2009/10 action are: • Lead on improving the protection, planning and management of all England's landscapes • Raise the quality, influence and effectiveness of policy and practical instruments • Increase the engagement in and enjoyment of landscapes by the public • Collaborate with partners across the UK and Europe.	The implementation of the Drought Plan may influence landscape or the enjoyment of landscapes in the Anglian Water SEA study area and as such the SEA should consider the need to maintain or enhance the quality of the regions landscapes and the potential enjoyment of these landscapes.
European Commission (2001) Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment (SEA Directive)	
The SEA Directive provides the following requirements for consultation: • Authorities which, because of their environmental responsibilities, are likely to be concerned by the effects of implementing the plan or programme, must be consulted on the scope and level of detail of the information to be included in the Environmental Report. These authorities are designated in the SEA Regulations as the Consultation Bodies (Consultation Authorities in Scotland). • The public and the Consultation Bodies must be consulted on the draft plan or programme and the Environmental Report, and must be given an early and effective opportunity within appropriate time frames to express their opinions. • Other EU Member States must be consulted if the plan or programme is likely to have significant effects on the environment in their territories. • The Consultation Bodies must also be consulted on screening determinations on whether SEA is needed for plans or programmes under Article 3(5), i.e. those which may be excluded if they are not likely to have significant environmental effects.	The Directive sets the basis for SEA as a whole and therefore indirectly covers all objectives.
European Commission (2011), *The EU Biodiversity Strategy to 2020*	
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 Drought Plan may influence biodiversity and as such the SEA should take account of the need to maintain or enhance the quality of habitats and biodiversity.
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	The SEA should seek to protect and conserve important bird habitats.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
discretion of each Member State (in the UK delivery is via several different statutes).	
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 (2008) *Marine Strategy Framework Directive* (2008/56/EC)	
The Directive sets out a framework for an ecosystem-based approach to the management of human activities which supports the sustainable use of marine goods and services. The overarching goal of the Directive is to achieve 'Good Environmental Status' (GES) by 2020 across Europe's marine environment. Each member state is required to develop a marine strategy for their waters to protect and conserve the marine environment, prevent its deterioration, and, where possible, restore marine ecosystems in affected areas. The strategies must contain: • An initial assessment of the current environmental status; • A determination of what GES means for those waters; • Targets and indicators designed to show whether a Member State is achieving GES; • A monitoring programme to measure progress towards GES; • A programme of measures designed to achieve or maintain GES The Directive also requires Marine Protected Areas (MPAs) to be established to support the achievement of GES.	The DP may have some influence on the marine environment and the SEA should seek to protect and conserve this.
European Commission (2008) *Ambient Air Quality Directive (2008/50/EC)*	
The 2008 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 DP 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 (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 DP.
European Commission (2006), *Fresh Water Fish Directive (2006/44/EC)*	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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 fresh water fish populations.
European Commission (2006), *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 implementation of the DP may influence biodiversity in the south east and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
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 (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 seek to ensure that the DP avoids causing direct or indirect damage to the aquatic environment or contamination of land that creates a significant risk to human health.
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 (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 DP 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 (1998), *Drinking Water Directive (1998/83/EC)*	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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 (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 DP options on internationally designated sites and species must be considered as part of the SEA.
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. 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 DP should be consistent with the aim to reduce water pollution caused by nitrate from agriculture. 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.
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.
Ramsar Convention (1971) *The 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.	The impacts of the DP options on important wetland habitats must be considered as part of the SEA.
United Nations (1992), *Convention on Biological Diversity (CBD)*	
The main objectives are:	The commitment to conserving biological diversity must be considered in any DP

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• Conservation of biological diversity • Sustainable use of its components • Fair and equitable sharing of benefits arising from genetic resources	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*	
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 DP and its constituent options.
The Environment Noise Directive (Directive 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. It also aims to provide the 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 SEA assessment framework should include for the protection against excessive noise.
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 underlie 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 DP 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.
The World Heritage Convention (UNESCO) 1972 – 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 Drought Plan and SEA should take account of the need to protect scheduled monuments and archaeological areas.
EU 7th Environmental Action Plan (2013)	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
The 7th EU Environmental Action Plan (EAP) will provide guidance for European environmental policy until 2020 and also sets out a long-term vision of where it aims the Union will be in 2050. The key objectives are: • To protect, conserve and enhance the Union's natural capital • To turn the Union into a resource-efficient, green, and competitive low-carbon economy • To safeguard the Union's citizens from environment-related pressures and risks to health and wellbeing	The Drought Plan and SEA should account for the need to maintain the region's natural capital, contribute towards a low-carbon economy and preserve health and wellbeing.
National	
Ancient Monuments and Archaeological Areas Act 1979	
This act addresses the protection of scheduled monuments including the control of works affecting scheduled monuments. It also addresses archaeological areas.	The DP and SEA should take account of the need to protect scheduled monuments and archaeological areas.
The Climate Change Act 2008	
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.	This target needs to be taken into account by the SEA.
Conservation of Habitats and Species Regulations 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 DP must fully comply with the Regulations. The impacts of the DP 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 DP may have an effect on public access to the countryside. The SEA should include objectives that take into account public access, protection of SSSIs and the management of relevant landscape designations.
Department of Energy and Climate Change (2011) National Policy Statements for Energy Infrastructure	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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 DP and any major energy proposals which may affect the availability of water in the Anglian Water's water supply area.
Department for Business, Energy and Industrial Strategy (2020) Energy White Paper: Powering our net zero future	
This white paper sets out the government's policies and commitments that will put us on course to net zero, levelling up the country and strengthening the union as we achieve this goal. It provides a strategy for the wider energy system that: • Transforms energy, building a cleaner, greener future for our country, our people and our planet • Supports a green recovery, growing our economy, supporting thousands of green jobs across the country in new green industries and leveraging new green export opportunities • Creates a fair deal for consumers, protecting the fuel poor, providing opportunities to save money on bills, giving us warmer, more comfortable homes and balancing investment against bill impacts	The implementation of the DP may have an influence upon Anglian 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.
Defra, Environment Agency, Natural England, Forestry Commission England et al. (2018) Defra's group strategy: creating a great place for living	
In 2018 Defra produced a strategy that set out objectives to great a great place for living, the following four objectives underpin the strategy: • To deliver a safe and ambitious departure from the EU, setting global standards in protecting and harnessing value from the natural environment • To pass on to the next generation a natural environment protected and enhanced for the future • To lead the world in food, farming and fisheries with a sustainable model of food production	The SEA must take into account impacts of the drought 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).
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	The SEA will help to inform future development by Anglian Water and therefore should consider this approach to natural capital.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
accounting principles and methods, benefits and challenges and applying natural capital at a local level.	
Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report	
This provides a number of recommendations such as: Agreement for the development of a 25 year plan for a healthy natural economy. This includes helping organisations understand the economic, social and cultural value the impact their actions have on it and how to use the knowledge for better decisions; identify most important and threatened environmental assets; protection of designated areas; address outstanding monitoring and data issues to enable better decisions about strategic investments in natural capital. Assigning institutional responsibility for monitoring the state of natural capital. Organisations that manage land and water assets should create a register of natural capital for which they are responsible.	Outputs from the SEA process will help to inform any future potential development by Anglian Water of Natural Capital Accounting (NCA) approaches to assessing environmental asset performance. Government (led by HM Treasury and Defra) is increasingly using NCA to support future environmental policy and decision-making, and there may be future expectations on water companies to follow suit.
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 overall aim is to minimise the risks posed, and reduce the negative impacts caused, by invasive non-native species in Great Britain.	The implementation of the DP may influence biodiversity in the south east and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Defra (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 Drought Plan should take into account the contents of this statutory guidance
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 DP considers any unforeseen NSIP proposals that come forward prior to adoption which may affect water resources in the Anglian Water area.
Defra (2018) Draft National Policy Statement for Water Resources Infrastructure	
The draft National Policy Statement for Water Resources Infrastructure (NPS) sets out the need and government's policies for the development of nationally significant infrastructure projects relevant to water resources in England. It will help to ensure that where nationally significant water resources infrastructure is needed, it can be delivered in a timely manner to a high standard.	The SEA should seek to ensure the DP considers any unforeseen NSIP proposals that come forward prior to adoption which may affect water resources in the Anglian Water area.
Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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 DP 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) 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 DP 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) Water for Life - Water White Paper	
This sets out market reform in the water sector.	The DP should take into account the contents of this paper.
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 DP supports the provisioning service of freshwater through ensuring security of supply during times of drought. The media campaigns that form part of the Demand side DP 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 DP effects the related provisioning services in the least damaging way through informing the DP formulation and selection of DP options during times of Drought.
Defra (2011) UK National Ecosystem Assessment Defra (2014) UK National Ecosystems Assessment Follow on, Synthesis of Key Findings	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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 DP 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 DP effects the related provisioning services in the least damaging way through informing the DP formulation and selection of DP options during times of Drought. 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 (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 (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 (2009) Construction code of practice for the sustainable use of soils on construction sites	
This Code of Practice was developed to assist anyone involved in construction to better protect and enhance the soil resources with which they work. The key messages include; consideration of sustainable drainage systems on site, preparation of Soil	Some drought options may have associated construction.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Resource Plan and to safeguard and utilise on-site soil resources where possible.	The SEA should seek to ensure that the quality of the regions soils and their management is protected or enhanced
Defra (2009) The Groundwater Regulations 2009	
The Groundwater Regulations are designed to implement a daughter directive to the European Water Framework Directive and prevent or limit the inputs of polluting substances into groundwater.	The SEA should include an objective relating to the effects of options on groundwater quality.
Defra (2008) 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. 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 (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 (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 DP 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 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.	The SEA must consider the impacts on biodiversity whilst also taking into account the potential for future climate change.
Defra (2006) Shoreline Management Plan Guidance	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
A shoreline management plan (SMP) is a coastal defence management tool. It is a large-scale assessment of the risks associated with coastal processes and helps to reduce these risks to people and the developed, historic and natural environment. This guidance document sets out Defra's strategy for managing flooding and coastal erosion.	The SEA should take into account the effects of the DP on areas with a SMP.
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 DP.
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 DP.
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. 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 (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 DP 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 (2002) The Strategy for Sustainable Farming and Food – facing the future	
This strategy sets out how industry, Government and consumers could work together to secure a sustainable future for our farming and food industries. The strategy's objectives are to support the viability and diversity of rural and urban economies and communities, respect and operate within the biological limits of natural resources (especially soil, water and biodiversity) and achieve consistently high standards of environmental performance by reducing energy consumption, by minimising resource inputs, and use renewable energy wherever possible.	The implementation of the DP may have some indirect links with the food industry, through ensuring the availability of water for food based activities. The SEA should also seek to promote the most effective use of the region's natural resources, including soil, biodiversity and energy resources.
Defra and Environment Agency (2019) How to Write and Publish a Drought Plan, *Consultation draft*.	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
This draft sets out how to assess the environmental effects of actions to maintain supply and how to mitigate. An environmental assessment must include details of changes as a result of actions to: Water flow or level regimes Water quality Ecology (sensitive features, habitats and species) Designated sites (habitats and species) Fish populations (in particular migratory fish) Additionally, an assessment must include effects on WFD status and consider effects on river basin management plans. Assessments should also take into account the Handbook for Scoping Projects: Environmental Assessment and the EcIA Guidelines. For SEAs of a DP, guidance should be followed in the DCLG (2005) Practical Guide to the Strategic Environmental Assessment Directive and UKWIR (2012) Strategic Environmental Assessment and Habitats Regulations Assessment: Water Resources Management Plans and DPs. Need to identify what needs to be done to mitigate or reduce adverse effects and provide compensation for effects that remain following mitigation. This includes the identification of pre-drought, in-drought and post drought mitigation actions.	The SEA must take into account the approach to environmental assessment and what needs to be done to mitigate or reduce adverse effects and provide compensation for effects that remain following mitigation.
Environment Agency (2018) Creating a better place: Our ambition to 2020	
This plan sets out the EA's vision to creating a better place for people and wildlife whilst maintaining the core purpose of protecting the environment and promoting sustainable development. The principles are: • Put people and wildlife first: the goal is to create a better place for them • 80/20: focus on the 20% that makes 80% of the difference • Support local priorities: ever place and community has its own needs.	The DP and SEA should take into account the objectives set out in the Agency's plan.
Environment Agency (2016), Drought plan guideline extra information: Environmental assessment for water company drought plans	
This supplements the guidance provided on how to write and publish a drought plan. It provides guidance on how to develop an environmental assessment to support a Drought Plan. It includes the need to consider whether an SEA is required for a drought plan.	The Drought Plan and SEA need to take account of the guidance provided by the Environment Agency
Defra (2020), Drought Plan Direction 2020 (England)	
Sets out the timescales for water companies to develop and consult on Drought Plans.	The Drought Plan and SEA will take account of the statutory requirements of this Direction.
Defra (2016) Guiding principles for water resources planning for water companies operating wholly or mainly in England	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
This identifies the key policy priorities to be addressed in WRMPs. This includes protecting and enhancing the environment and the promotion of efficient water use and reducing leakage.	The Drought Plan is closely aligned to the WRMP, and the SEA needs to take account of this guidance.
Department for Culture, Media and Sport (2001) *The Historic Environment – A Force for the Future*	
This strategy outlines the Governments 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 DP may have an influence on the heritage of the region, particular if options affect surface water levels. The SEA should seek to ensure any adverse effects on heritage assets are minimised or avoided.
The Energy Act 2013	
This provides the legislative framework for delivering secure, affordable and low carbon energy. It includes provisions for decarbonisation,	The implementation of the DP may have an influence upon Anglian 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.
Environment Act, 1995	
The Environment Act set up the EA to manage resources and protect the environment in England.	The SEA should seek to promote the protection and enhancement of all water resources without having negative effects on other aspects of the Environment.
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 we 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 DP. The DP and SEA need to take account of the guidance provided by the Environment Agency.
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.
Environment Agency (2011) National Flood and Coastal Risk Management Strategy for England	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
This strategy provides the overarching framework for future action by all risk management authorities to tackle flooding and coastal erosion in England, building on existing approaches. Risk should be managed in a co-ordinated way within catchments and along the coast and balance the needs of communities, the economy and the environment. This strategy will form the framework within which communities have a greater role in local risk management decisions and sets out the Environment Agency's strategic overview role in flood and coastal erosion risk management (FCERM).	The SEA should consider how the DP may affect flood and coastal risk across 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 (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 (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 DP 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 (2004) *Catchment Flood Management Plans: Guidelines – Volume 1 Policy*	
These guidelines support the EA's strategy for flood risk management and work towards achieving the government's strategy for flood and coastal erosion flood risk management. The aims of Catchment Flood Management Planning is: • To promote sustainable flood risk management measures • To reduce the sources of flooding and harm to people, and the natural, built and historic environment caused by floods • To support the delivery of the Government's and others' policies and targets, and the Environment Agency's environmental vision.	The DP links to this plan where it affects flood risk or land management, for example through changes in abstraction or water storage. The SEA should consider how the DP may affect flood risk across the region.
Environment Agency (2018), *Water Resources Planning Guideline: Interim update*	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Technical guidelines published jointly by Defra, Environment Agency and Ofwat for the 2019 Water Resource Management Plans for England.	The SEA should seek to ensure that water supplies and resources are maintained or enhanced in line with the Water Resources Planning Guidelines.
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 DP 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 (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 DP and SEA should ensure relevant ecological considerations are integral to water resource evaluation and management decisions across the range of temporal and spatial scales.
English Heritage, now known as Historic England (2008) 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 DP in combination with climate change and the potential impacts on heritage and the historic environment.
Flood and Water Management Act, 2010 as amended	
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 DP and that water supplies across the region are maintained.
Historic England, 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 heritage and landscape.
Historic England (2019) Heritage Counts 2019: There's No Place Like Old Homes: Re-Use and recycle to Reduce Carbon	
This report by Historic England highlights the importance of the built historic environment and why it has a vital role in the journey towards a low carbon future. The study recognises the built environment as one of the largest carbon polluters and how using and re-using historic assets will avoid emitting more carbon.	The SEA should consider the findings of this report and the effect building has on heritage assets and climate change.
Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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) Sustainability Appraisal and Strategic Environmental Assessment	
Guidance for addressing the historic environment in Strategic Environmental Assessment or Sustainability Appraisal. 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 DP on the historic environment, particularly designated assets and their settings, and to important wetland areas with potential for paleo-environmental deposits. Historic characterisation can supplement information about designations. Sustainability issues, objectives and indicators identified in this document should be taken into account in the SEA.
HM Government (2021) Build Back Better: our plan for growth	
Plan for growth of the UK following the COVID-19 pandemic. The plan focusses on three pillars of investment to act as the foundation on which to build the economic recovery. The pillars include; high quality infrastructure, giving people skills to succeed and innovation to drive economic growth and creation of jobs. The plan specifically outlines green growth is key and has a ten point plan for a Green Industrial Revolution whilst fulfilling the commitment to leave the natural environment in a better condition than we found it.	The SEA should consider the Government's green approach to economic growth and take these ambitions into account.
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	The DP 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 drought 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.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• Securing clean, productive and biologically diverse seas and oceans • Protecting and improving the global environment	
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 DP 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 DP can contribute to the providing resilient water services.
HM Treasury (2015) Fixing the Foundations: creating a more prosperous nation.	
This document sets out a 15-point plan that the government will put into action to boost the UK's productivity growth, centred around two key pillars: encouraging long-term investment, and promoting a dynamic economy. It sets out the government's long term strategy for tackling the issues that matter most for productivity growth.	The DP should have regard to the points included in the plan
Marine and Coastal Access Act 2009	
The Marine and Coastal Access Act sets out a number of measures, including the establishment of Marine Conservation Zones (MCZs) and Marine Spatial Plans. I	The DP should have regard to effects on coastal areas. The SEA should take into account the effects of the measures of coastal environments where relevant.
Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework 2019	
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	The DP and SEA should take account of the key components of the NPPF to ensure sustainable development and seek to promote biodiversity net gain.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.	
Ministry of Housing, Communities and Local Government (2019) National Planning Practical Guidance	
Planning practice guidance accompanies the National Planning Policy Framework. The following practice guidance was considered relevant to Anglian Water's DP: • Air Quality • Climate Change • Historic Environment • Natural Environment • Strategic environmental assessment and sustainability appraisal • Water supply, wastewater and water quality	The DP and SEA should take account of the key components of the NPPF practical guidance to ensure sustainable development.
Natural England (2020) Building partnerships for Nature's recovery	
This document explains how Natural England will work with a wide range of people and organisations to take the action needed to rebuild a sustainable environment.	The SEA should take account the key components of Natural England's work.
Natural England (2020) Climate Change Adaptation Manual	
This Adaptation Manual is a resource to support practical and pragmatic decision-making, by bringing together recent science, experience and case studies, and is intended to be an accessible entry point to a range of available resources and tools. It is not intended to be read from cover to cover: different elements stand alone and can be read individually. We anticipate that the information contained here will be useful to a variety of people, including managers of nature reserves and other protected sites, conservation and land management advisors, and environmental consultants. The intended audience is those who are involved in the management of land for conservation and amenity, and includes staff of local and national government, statutory agencies and NGOs.	The SEA must consider the need for adaption to climate change.
Natural England (2016) A narrative for conserving freshwater and wetland habitats in England (NERR064)	
This narrative provides an overview of circumstances relating to the conservation of freshwater and wetland habitats in England, considering their ecological function, the natural and anthropogenic factors affecting them, the principles that should be applied to their management, and the respective roles of the main policy mechanisms involved in their conservation. It covers all running and standing water habitats, of whatever size, and	The DP has the potential to impact freshwater and wetland habitats. The SEA should seem to conserve these habitats.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
terrestrial wetland habitats including bogs, fens, swamp and wet woodland.	
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 DP 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 addresses listed buildings including prevention of deterioration and damage and preservation and enhancement of conservation areas.	The DP 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.
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015	
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 a Site of Special Scientific Interest (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 provided by the regulations is considered when assessing the DP.
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 SEA should seek to maintain the quality of habitats and biodiversity, and take regard of protected species identified. This should include migratory

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.	fish species and their migratory passage.
UKTAG on the WFD e.g. Phase 3 Review of Environmental Standards	
UKTAG prepares technical guidance designed to facilitate consistent implementation of the WFD in the UK. This report identifies standards for certain chemicals known as specific pollutants, developments in assessments of risk to groundwater, non-native species, standards for flows in rivers, standards for levels in lakes, standards for acidity in rivers and standards in intermittent discharges.	The SEA should seek to ensure that the guidance provided by the plan are considered when assessing the DP, especially with respect to objectives relating to ecology, water quality and water quantity. The SEA should also ensure the guidance in the plan is used in relation to other related regulations for example the Habitats Directive. The guidance could contribute to the formulation of any criteria for assessing significance of effects.
UKCIP (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 DP indirectly takes account of UKCP18 projections through the WRMP process which takes 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 DP will also be influenced by climate change.
The Water Act, 2003	
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 DP 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 (WFD) Regulations, 2003	
These Regulations make provision for the purpose of implementing in river basin districts within England and Wales. The Water Framework Directive (2000/60/EC) of the European Parliament. The Regulations require a new strategic planning process to be established for the purposes of managing, protecting and improving the quality of water resources.	The SEA should seek to promote the protection and enhancement of all water resources. The SEA should seek to maintain, protect and improve water quality across the region and ensure efficient use of resources.
Water Resources Act, 1991 (Amendment) Regulations 2009 SI3104	

Objectives identified in the Policy, Plan or Programme	Influences on the DP 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.
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 DP 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.
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 DP must take into account this legislation.
The Water Resources Management Plan Regulations 2007	
This provides the legislation for the preparation of water resources management plans.	The DP should take account of these requirements.
Water UK (2016) Water Resources Planning Framework (2015-2065)	
Water UK worked with companies, regulators, academics and NGOs to create this long-term Water Resources Planning Framework. The report breaks new ground by deploying new modelling techniques and by looking 50 years ahead across the whole of England and Wales. This high level strategy and framework considers: • A sector-wide view of future resilience and options for improving that resilience; and • An assessment of variation in levels of service and potential minimum levels of service for customers and the environment, accounting for costs and benefits at a national, regional and sub-regional level, which includes the wider social impacts of drought and drought resilience.	The DP should take into account the considerations of the strategy and framework.
Wildlife and Countryside Act, 1981	
The Act is the principle mechanism for providing legislative protection of wildlife in Great Britain.	Some aspects of the DP may have effects on habitats and species in the Anglian Water's water supply area and beyond. The SEA should seek to

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.	maintain or enhance the quality of habitats and biodiversity, and take regard of protected species and habitats.
WWF-UK (2017) Water for Wildlife: Tackling Drought and Unsustainable Abstraction	
This report from WWF-UK looks at the risk of unsustainable abstraction on rivers and the wildlife that is reliant on them. It urges the government to bring forward the Water Bill and include key areas such as: • Transposing the WFD in full and establishing mechanisms and sanctions to enforce its implementation and uphold its 2027 deadline after leaving the EU • Introduction a new 'Restoring Sustainable Abstraction' scheme • Ensure all licences and permits prevent future damaging abstraction • Devise a national strategy to cut water waste and improve efficiency in homes and businesses whilst engaging the public on the value of water	The DP should take into the account the issues highlighted in the report by WWF-UK.
Draft National Policy Statement for Water Resources (November 2017)	
The government recognises the need for a 'twin track' approach to improve the resilience of water supplies. This means further ambitious action to reduce the demand for water alongside new water resources. The government wants to make sure that where new large infrastructure is needed, it can be delivered in a timely manner to a high standard. To help achieve this, NPS will streamline the process of gaining planning consents for nationally significant water resource infrastructure projects. The government intends to support infrastructure that: • Secures long-term resilience to the impacts of drought and climate change as set out in the strategic policy statement (SPS)14 to Ofwat and supports the aims of the government's national adaptation programme (NAP) on climate change • Supports both an increase in population and economic growth across England, in line with the aims of the Industrial Strategy • Supports the achievement of sustainability goals and enhances the environment, in line the Environment Agency's water industry national environment programme (WINEP) and in a way that will be set out in the government's 25-year Environment Plan • Offers best value for customers so that water needs can be met in an affordable way both now and in the future, in line with the strategic objective set out in the SPS.	The DP should take into account the strategies to improve resilience of water supply.
Regional	
Anglian Region River Basin Management Plan (2015)	
The purpose of a river basin management plan is to provide a framework for protecting and enhancing the benefits provided by the water environment. To achieve this, and because water and	The DP will need to ensure that it is consistent with the principles of the River Basin Management Plan and that it does

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
land resources are closely linked, it also informs decisions on land-use planning. It sets out the: • Current state of the water environment • Pressures affecting the water environment • Environmental objectives for protecting and improving the waters • Programme of measures, actions needed to achieve the objectives • Progress since the 2009 Plan	not adversely affect the issues identified as significant water management issues.
Anglian Water's Water Resources Management Plan 2019 (2019)	
The 2019 WRMP sets out Anglian Water's 25-year (2020-2045) strategy for managing supply and demand. The document recognises that the supply demand balance is under significant pressure. Anglian Water plan to use a twin-track approach to mitigate supply-demand risk which meets short-term needs but is also flexible enough for the future.	The DP will take into account the objectives of Anglian Water's WRMP
The Broads Plan 2017, Broads Authority	
The Broads Plan 2017 aims to provide a long-term vision and guide the management actions for benefit of the natural and cultural environmental, local communities and visitors. It covers the period 2017-2022, is the key management plan for the Broads and is updated every five to seven years. The Broads Plan 2017 has eight key themes which integrate environmental, economic, social, and cultural concerns. One such theme is concerned with managing water resources and flood risk.	There may be some social, economic and environment effects associated with the implementation of the DP that may have effect upon the sustainable development and regeneration of The Broads. The SEA should seek to address the potential social, economic and environmental effects.
Management Plans for Areas of Outstanding Natural Beauty (AONB): Lincolnshire Wolds 2018-2023, Norfolk Coast 2019-2024, Dedham Vale 2016-2021	
Lincolnshire Wolds 2018-2023: Produced by the Lincolnshire Wolds Countryside Service the Plan sets out strategic objectives to ensure the consistency and continuity for the management of the area over time. Norfolk Coast 2019-2024: Outlines the background and strategic approach of the Norfolk Coast Partnership for managing the area. It sits alongside a separate action which will be reviewed annually. It highlights the qualities of the of the area, the pressures for change, the objectives, and policies, and how the objectives will be achieved. Dedham Vale 2016-2021: Sets out how a partnership of organisations (environmental, agricultural, business etc) seek of balance the need to the various whilst protecting the AONB. It outlines six strategic topics which cover the key issues (the countryside, resident, and villages, enjoying the area, the river and its tributaries, climate change, and working together) and offer management objectives and policies for securing the vision of the area.	The SEA should consider the effects of options on landscapes, including designated landscapes.
Anglian Water Biodiversity Strategy	
The Biodiversity Strategy outlines how Anglian Water will conserve biodiversity across the East of England to meet their legal obligations whilst contributing to England's Biodiversity 2020 Strategy. It will also help Anglian Water achieve their 'A Flourishing Environment' Business Plan. The Strategy describes	The DP may have an effect on Biodiversity Strategy objectives. The SEA should include objectives that take into account the objectives of the

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
the key threats and challenges and highlights the work Anglian Water will do on their sites and across the region.	Biodiversity Strategy where relevant (e.g. conservation designation status).
Northamptonshire Biodiversity Action Plan (2016)	
This is the third edition of the Plan and sets out the priorities for the most threatened and declining habitats in Northamptonshire. It included general as well as habitat specific action plans and targets. It includes a Nature Improvement Area for the Nene Valley.	The DP may have an effect on BAP objectives. The SEA should include objectives that take into account the objectives of the BAP where relevant (e.g. conservation designation status).
Suffolk Planning Biodiversity Action Plan (2012)	
The Plan covered forward plans including local planning documents, Shoreline Management Plans and Local Authority coastal defence planning and AONB. It was the first in England to develop an action plan dedicated to planning issues and the aim is provide clarity by collating all information on biodiversity in one place. There is no longer a UK BAP as this the strategy for the UK has been replaced by Biodiversity 2020, however the BAP is still enshrined in law through the NERC Act 2006 and in national planning policy.	The DP may have an effect on BAP objectives. The SEA should include objectives that take into account the objectives of the BAP where relevant (e.g. conservation designation status).
Northumbrian Water Group (NWG) Biodiversity Strategy (2015)	
The NWG is an updated version of the combined Biodiversity Strategy for Northumbrian Water and Essex and Suffolk Water. The strategy sets out NWG's values and approach to biodiversity and identifies areas of focus for supporting involvement in biodiversity conservation.	The DP may have an effect on Biodiversity Strategy objectives. The SEA should include objectives that take into account the objectives of the Biodiversity Strategy where relevant (e.g. conservation designation status).
The Nene Catchment CAMs Strategy, Environmental Agency (2013)	
The Catchment Abstraction Management Strategy (CAMS) set out how the Environmental Agency will manage water abstraction and contribute to the Water Framework Directive (WFD). It outlines where water is available, and if relevant, where the Environment Agency needs to reduce current rates of abstraction. It also provides an overview of the catchment area and characteristics, including abstractions, geology, hydrology, hydrometry, water quality and discharges, ecology and conservation, recreation, and navigation. The CAMS make information on water resources and licensing practice publicly available and allow the balance between the needs of abstractors, other water users and the aquatic environment to be considered in consultation with the local community and interested parties.	The DP operation may have the potential to affect several of the CAMs objectives. The SEA will include objectives that take into account the objectives of the CAMs where relevant.
Abstraction Licensing Strategies, Environmental Agency: Essex (2017), Cam and Ely Ouse (2017) and North-West Norfolk (2017)	
The strategy sets out the Environmental Agency's approach to managing new and existing abstraction and impoundment within the Essex, and the Cam and Ely Ouse, catchment in the Anglian river basin district. It provides information about where water is available for further abstraction and also indicates how reliable a new abstraction license may be. It provides an overview of assessment points, groundwater, level dependent environments, heavily modified water bodies, protected areas, and supported rivers.	The DP operation may have the potential to affect several of the Abstraction Licensing Strategies objectives. The SEA will include objectives that take into account the objectives of the Abstraction Licensing Strategies where relevant.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Drought Management in England, Environmental Agency (2017)	
This framework sets out how drought affects England and how the Environmental Agency intends to work with the government, water companies and others to ensure the effects on people, business and the environment are management. It also covers the action they, and others, take to manage drought, how drought is monitored and how they intend to report on drought.	The Drought Plan and SEA need to take account of the guidance provided by the Environment Agency
Cambridge Water Final Drought Plan (2018)	
This provides an update to the 2012 iteration. It sets out how they will response to periods of extended dry weather and demonstrates how they will monitor and manage these drought event as well as the actions they will take. They intend to use a variety of drought management interventions on both the supply and demand side in order to ensure continued supply for customers. Updates have included amending supply side options to reflect current operation conditions and status of source works. In order to incorporate the latest guidance, the monitoring and environmental assessment of the supply options have been developed. Demand actions have mainly remained unchanged, although they have updated the communication section to align with company changes.	Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in neighbouring water companies' drought plans has been undertaken. The assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought option has been made in the intervening period, and that the assessment, therefore, remains valid
Essex and Suffolk Water Draft Drought Plan (2018)	
Essex and Suffolk Water, a trading division of Northumbrian Water Limited, has prepared the Draft Drought Plan to identify how they intend to manage a future drought. They have identified triggers to highlight when action is required and have identified measure available to support supplies when they may be low.	Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in neighbouring water companies' drought plans has been undertaken. The assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought option has been made in the intervening period, and that the assessment, therefore, remains valid
Severn Water Drought Plan (2019)	
An update to the 2014 iteration, Severn Water cover 2019-24 and explain how they will manage supply and demand during a drought in their region. They are confident that their plan represents a good balance between cost, environment, and resilience to severe droughts. Their stochastic drought modelling indicates that we are resilient to a 1 in 200-year drought without the need for emergency drought orders.	Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in neighbouring water companies' drought plans has been undertaken. The assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought option has been made in the intervening period, and that the assessment, therefore, remains valid
Thames Water Drought Plan 2017	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
The Drought Plan 2017 outlines how Thames Water will react to a period of drought and develops a plan for action to achieve increased protection against more severe droughts. It shows Thames Water can meet with the existing asset base: • Its planned levels of service, for the twentieth century droughts in the historic record • A range of more severe drought scenarios, although with less resilience	Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in neighbouring water companies' drought plans has been undertaken. The assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought option has been made in the intervening period, and that the assessment, therefore, remains valid
Yorkshire Water Final Drought Plan 2019	
Yorkshire Water set out how they would manage resource, mitigate risk, and communicate with customer during a drought. They intend to implement a range of drought management actions covering customer management, distribution management and resource management.	Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in neighbouring water companies' drought plans has been undertaken. The assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought option has been made in the intervening period, and that the assessment, therefore, remains valid
Haven Gateway Green Infrastructure Strategy	
The Strategy provides an update on the progress and carries out analysis on the provision and deficiencies of accessible natural greenspace. It also provides a framework for implementing local plans across the four authorities is covers.	Options in the DP have potential to cause social, economic and environmental impacts. The SEA assessment framework should consider the effects of the DP on the achievement of the strategy's key priorities and the effects on water management, natural capital, landscape and biodiversity.
Colchester Borough Green Infrastructure Strategy	
The Strategy aims to identify high quality accessible green infrastructure, identify the ecological links and networks between habitats and deliver community well-being.	Options in the DP have potential to cause social, economic and environmental impacts. The SEA assessment framework should consider the effects of the DP on the achievement of the strategy's key priorities and the effects on water management, natural capital, landscape and biodiversity.
Northampton Green Infrastructure Plan	
The Plan aims to provide the most important step towards Northampton's planning and delivery of green infrastructure. The	Options in the DP have potential to cause social, economic and environmental impacts.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
River Nene is specified as a Green Corridor amongst the different types of green infrastructure.	The SEA assessment framework should consider the effects of the DP on the achievement of the strategy's key priorities and the effects on water management, natural capital, landscape and biodiversity.
Greater Norwich Green Infrastructure Strategy	
This provides a strategic plan to ensure pressures on important natural and historic aspects of green infrastructure are minimised and seeks to maximise opportunities to enhance green infrastructure.	Options in the DP have potential to cause social, economic and environmental impacts. The SEA assessment framework should consider the effects of the DP on the achievement of the strategy's key priorities and the effects on water management, natural capital, landscape and biodiversity.
Peterborough Green Grid Strategy	
The Strategy sets out a strategic framework and action plan for green space provision throughout the Greater Peterborough area to ensure the provision of green infrastructure goes hand in hand alongside development and growth in the area.	Options in the DP have potential to cause social, economic and environmental impacts. The SEA assessment framework should consider the effects of the DP on the achievement of the strategy's key priorities and the effects on water management, natural capital, landscape and biodiversity.
National Character Areas (NCAs): 92 Rockingham Forest (NE538); 85 The Brecks (NE385); 78 Central North Norfolk (NE526); 48: Trent and Belvoir Vales (NE429); 89 Northamptonshire Vales (NE527); 88 Bedfordshire and Cambridgeshire Claylands (NE555); 86 South Suffolk and North Essex Claylands; and 111 Northern Thames Basin (NE466).	
92 Rockingham Forest (NE538) a broad, low, undulating ridge underlain by Jurassic limestone which falls away from a prominent, steep northern scarp overlooking the Welland Valley. 85 The Brecks (NE385) lies at the heart of East Anglia, occupying much of south-western Norfolk and north-western Suffolk, together with a small part of north-eastern Cambridgeshire. 78 Central North Norfolk (NE526) is a gently undulating rural landscape of the Central North Norfolk NCA and stretches from the slightly flatter, more open land of Mid Norfolk NCA, to the prominent glacial landform of the Cromer Ridge and the dynamic exposed coastline of coastal cliffs, where large storm events dramatically shape its character. 48: Trent and Belvoir Vales (NE429) is characterised by undulating, strongly rural and predominantly arable farmland, centred on the River Trent. A low-lying rural landscape with relatively little woodland cover, the NCA offers long, open views. 89 Northamptonshire Vales (NE527) consists of a series of low-lying clay vales and river valleys, including the valleys of the rivers Nene and Welland and their tributaries. The area is 10 per cent urban, and settlement is often visually dominant. 88 Bedfordshire and Cambridgeshire Claylands (NE555) is a broad, gently undulating, lowland plateau dissected by shallow river valleys that gradually widen as they approach The Fens NCA	The DP may have an effect on NCAs. The SEA should include objectives that take into account the objectives of the NCAs where relevant (e.g. manage and enhance existing habitats).

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
in the east. Within it, but distinct from it, is the Bedfordshire Greensand Ridge, a contrasting narrow and elevated outcrop of Greensand, with its associated habitats on acidic soils such as grassland, heathland and woodland. 86 South Suffolk and North Essex Claylands covers the four counties of Suffolk, Essex, Hertfordshire and Cambridgeshire. It stretches from Bury St Edmunds in the north-west to Ipswich in the north-east, roughly following the line of the A14 trunk road through the Gipping Valley. 111 Northern Thames Basin (NE466) is a diverse area which extends from Hertfordshire in the west to the Essex coast in the east. It is separated from the North Sea and Thames Estuary by a narrow band of land that makes up the Greater Thames Estuary NCA.	
Flood Risk Management Plans	
Flood Risk Management Plans (FRMPs) highlight the hazards and risks of flooding from rivers, the sea, surface water, groundwater and reservoirs, and set out how Risk Management Authorities (RMAs) work together with communities to manage flood risk.	The DP links to these plans where it affects flood risk or land management, for example through changes in abstraction or water storage. The SEA should consider how the DP may affect flood risk across the region.
Humber Estuary Coastal Authorities Group - Flamborough Head to Gibraltar Point Shoreline Management Plan (SMP) 2010	
This SMP covers the northern reaches of the Anglian Water region which includes the coastal along the Humber Estuary to Gibraltar Point. This is coastal frontage number three within the national shoreline management programme. The section of the Anglian Water region which is covered by this SMP predominately includes hold the line policy with some areas of managed realignment. The River Trent Drought Permit option zone of influence is covered within this SMP.	The SEA should take into account the effects of the DP on areas with a SMP.
The Wash Shoreline Management Plan 2 – Gibraltar Point to Old Hunstanton	
This is coastal frontage number four within the national shoreline management programme. The SMP has a mixture of hold the line, managed realigned and no active intervention across the four policy areas which it covers. The River Nene and River Great Ouse estuaries are covered within this SMP. There is also a separate action plan for The Wash SMP which summarises all the specific actions that are needed to implement the plan and the policies. This includes actions by the EA and local authorities to develop flood and erosion defence schemes.	The SEA should take into account the effects of the DP on areas with a SMP.
North Norfolk Shoreline Management Plan (2010)	
This is coastal frontage number five within the national shoreline management programme and covers the frontage from Old Hunstanton up to the end of the shingle ridge at Kelling Hard. It also includes a mixture of hold the line, management realignment and no active intervention across the three policy areas which it covers. There are no Drought Plan 2019 options covered by this SMP.	The SEA should take into account the effects of the DP on areas with a SMP.
Kelling to Lowestoft Ness Shoreline Management Plan (2012)	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Number six in the coastal frontage within the national shoreline management programme. This SMP covers the River Wensum: Costessey Boreholes zone of influence which has a hold the line policy.	The SEA should take into account the effects of the DP on areas with a SMP.
Essex and South Suffolk Shoreline Management Plan 2 (2010)	
This SMP is the eighth coastal frontage within the national shoreline management programme. The zone of influence for the River Gipping: Sproughton Intake option is covered within this SMP which a mixture of advance the line, hold the line, managed realignment and no active intervention. The River Colne Augmentation zone of influence is also covered within this SMP which predominately has hold the line policy with some management realigned and one area for no active intervention in the 2055-2100 epoch.	The SEA should take into account the effects of the DP on areas with a SMP.
Draft Lincolnshire Rights of Way Improvement Plan (RoWIP) 2014-2019	
The second RoWIP produced by the County Council provides a strategic framework for undertaking Public Rights of Way (PRoW) improvements and provides opportunities to attract external funding. It has identified three broad areas for improvement including: network improvements, improved customer service and social inclusion.	The DP operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the objectives of the ROWIPs where relevant.
Norfolk Access Improvement Plan (NAIP) 2019-2029	
The Plan sets out the County Council's aspirations for improving their network of local rights of way. It has an overarching goal to continuously review and improve efficient management of both Public Rights of Way (PRoW) and Access, as well as cycle tracks, and permissive access in Norfolk, promoting national and regional routes, and parish networks.	The DP operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the objectives of the ROWIPs where relevant.
Suffolk Green Access Strategy Rights of Way Improvement Plan (ROWIP) 2020-2030	
The Plan highlights Suffolk County Council's commitment to the network through a targeted maintenance and improvement programme that provides substantial benefits across the county. The key themes are as follows; managing green access infrastructure, improving green access infrastructure, promoting green access and developing healthy and sustainable communities	The DP operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the objectives of the ROWIPs where relevant.
Essex County Council Rights of Way Improvement Plan (2009)	
This outlines the future plans of the County Council to assist in the delivery of a better quality of life by ensuring the network meets the needs of residents and visitors. The objectives of the Plan have been identified across five themes including: environment, improved accessibility, safety, quality of life and good health, tourism and economy, and communities and partnerships.	The DP operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the objectives of the ROWIPs where relevant.
Cambridgeshire County Council Rights of Way Improvement Plan Update (2016)	
First adopted in 2006, the update provides a summary of progress since the publication of the Plan and sets out future for RoW to 2031. Their actions are grouped into eight categories: making the countryside more accessible; safer and health-enhancing activities; 72,500 new homes; knowing what's out there; filling the	The DP operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
gaps; better land management; development of a definitive map and other resources; and a better countryside environment.	objectives of the ROWIPs where relevant.
Peterborough Rights of Way Improvement Plan 2016-2026	
This new RoWIP will outline a series of updated policies and measures that will lead to additional investment in local RoW. There are four key actions included in the RoWIP which are as follows: reducing the unnecessary physical barriers to the network, promotion of the countryside to residents and visitors; develop function and well maintained routes into the countryside; and help people improve their health through maintain circular routes.	The DP operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the objectives of the ROWIPs where relevant.
Northamptonshire County Council Rights of Way Improvement Plan 2020-2030	
The RoWIP was first published in 2007 and contained 38 outcomes which encompassed nine core actions. This document provides an update of the progress made against these actions which include: a safe and joined up network; making access easier for everyone; improve people's health and enjoyment; improve links between communities; improve signage; increase publicity and implementation; travel choices; and harnessing growth.	The DP operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the objectives of the ROWIPs where relevant.
England Coast Path: improving public access to the coast	
Natural England is working on developing the England Coast Path which is a new National Trail around all of England's coast. Work is ongoing at the time of writing. The England Coast Path is at a variety of stages across the Anglian Water's water supply area where the majority of the coastal stretches have proposals in development.	The DP should have regard to effects on coastal areas. The SEA should take into account the effects of the measures of coastal environments where relevant.
Local Planning Authority (various) Local Plans/Local Development Plans	
The Anglian Water SEA study includes a large number of Local Planning Authorities. Each these prepare Local Plans for the purposes of setting the framework for future development. They define the priorities for a particular area including; the strategic policies, land allocations, infrastructure requirements, housing needs, requirements for safeguarding the environment and measures for adapting to climate change.	The Drought Plan 2022 should take into account the Local Plans and emerging Local Plans. The SEA assessment framework should consider the effects of the Drought Plan 2022 on the achievement of the Plans' visions and the effects of options on sustainable land use.
Historic Environment Records (various)	
Historic Environment Record (HER) databases linked to a Geographic Information System (GIS) are held by County Councils, District Councils or Unitary Authorities. They represent unique repositories of, and signposts to, information relating to landscapes, buildings, sites and artefacts spanning from the Palaeolithic period to modern times.	Presenting this wealth of information for the Anglian Water SEA study area would be difficult, however, it can be interrogated where the Drought Plan options have the potential to affect such assets.
Greater Norwich Development Partnership- Water Cycle Study	
The objective of Water Cycle Studies are to provide an integrated approach to managing flood risk, water supply, and wastewater infrastructure in the Study Area, mindful of the environmental constraints. They intend to address the following key issues:	The Drought Plan should impact on the key issues outlined in the Water Cycle Study.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• Location of development in relation to key water and wastewater infrastructure; • Capacity of existing infrastructure; • Additional impact on existing infrastructure; and • Major constraints	

Appendix B

Environmental Baseline Review

B Environmental Baseline Review

B.1 Biodiversity, Fauna and Flora

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.

B.1.1 Nature Conservation Designations

The Anglian Water SEA study area includes a variety of sites that are designated at a European, national or local level as important for biodiversity, flora and fauna. The baseline from the previous SEA has collected information for the numerous Special Areas of Conservation (SAC), Special Protection Areas, Ramsar, Sites of Special Scientific Interest (SSSI) and national and locally designated sites located within Anglian Water's supply area which have the potential to be affected by the Drought Plan. These have been reviewed and updated for Drought Plan 2022. All sites within 5km of the proposed Drought Plan 2022 options together with any sites beyond the 5km boundary that could be affected by changes to surface or groundwater levels either upstream or downstream of the proposed option have been included in the baseline review. Where possible, sites which have no water dependent habitats or species were screened out of the baseline. These are shown in **Table B.1** to **Table B.6**.

Table B.1 Ardleigh Reservoir (River Colne Augmentation): Designated sites

Designation	Site name
Sites of Special Scientific Interest (SSSI)	Arger Fen, Blackwater Estuary, Bullock Wood, Chalkney Wood, Colne Estuary, Cornard Mere, Little Cornard, Roman River, Upper Colne, Marshes
Special Protection Areas (SPA)	Colne Estuary (Mid Essex Coast Phase 2), Blackwater Estuary (Mid-Essex Coast Phase 4)
Ramsar	Colne Estuary (Mid Essex Coast Phase 2), Blackwater Estuary (Mid-Essex Coast Phase 4)
Special Areas of Conservation (SAC)	Essex Estuaries
Local Nature Reserve (LNR)	Bull Meadows, Brickfield and Long Meadow, Colne, Colne Valley, Hilly Fields, Lexden Park, Salary Brook, Spring Lane Meadows, Welsh Wood

Table B.2 Costessey Groundwater Source (River Wensum): Designated sites

Designation	Site name
Sites of Special Scientific Interest (SSSI)	River Wensum (also SAC), Swannington Upgate Common, Buxton Heath
Special Protection Areas (SPA)	

Special Areas of Conservation (SAC)	River Wensum
Local Nature Reserve (LNR)	Bowthrope Marsh

Table B.3 Grafham Water (River Great Ouse: Intake): Designated sites

Designation	Site name
Sites of Special Scientific Interest (SSSI)	Ouse Washes, The Wash, Portholme, Godmanchester, East Side Common, Houghton Meadow, Berry Fen, Grafham Water
Special Protection Areas (SPA)/ Ramsar	Ouse Washes SPA and Ramsar, The Wash SPA and Ramsar
Special Areas of Conservation (SAC)	Portholme, Ouse Washes, The Wash & North Norfolk Coast
Local Nature Reserve (LNR)	Mare Fen, Somersham
Area of Outstanding Natural Beauty (AONB)	Norfolk Coast

Table B.4 Pitsford Reservoir (River Nene: Intake): Designated sites

Designation	Site name
Sites of Special Scientific Interest (SSSI)	Bonemills Hollow, Castor Flood Meadows, Pitsford Reservoir, Sutton Heath and Bog, Wadenhoe Marsh and Achurch Meadow, Wansford Pasture, Wollaston Meadow, Orton Pit, Nene Washes, Upper Nene Valley Gravel Pits
Special Protection Areas (SPA)/ Ramsar	Upper Nene Valley Gravel Pits SPA and Ramsar, Nene Washes SPA and Ramsar
Special Areas of Conservation (SAC)	Orton Pit, Nene Washes
Local Nature Reserves	Kingsthorpe, Barnes Meadow, Summer Leys, Kinewell Lake, Titchmarsh, Woodston Ponds, The Boardwalks

Table B.5 Wellington Wellfield (Intake): Designated sites

Designation	Site name
Sites of Special Scientific Interest (SSSI)	Boughton Fen, Breckland Farm, Breckland Forest, Cranwich Camp, Didlington Park Lakes, Eriswell Low Warren, Field Barn Heaths, Foulden Common, Foxhole Heath, Gooderstone Warren, Great Cressingham Fen, Grime's Graves, Hooks Well Meadows, Lakenheath Poors Fen, Lakenheath Warren, London Road Industrial Estate, Lord's Well Field, Maidscross Hill, Old Bodneycamp, Pashford Poors Fen, RAF Lakenheath, Stallode Wash, Stanford Training Area, The Brinks, Northwold, Thetford Golf Course and Marsh, Thetford Heaths, Wangford

	Warren and Carr, Weeting Heath, Wretham Park Meres, Wretton
Special Protection Areas (SPA)	Breckland
Special Areas of Conservation (SAC)	Breckland, Norfolk Valley Fens
National Nature Reserve (NNR)	Weeting Heath, Thetford Heath
Local Nature Reserves (LNR)	Maidscross Hill,

Table B.6 Rutland Water (River Nene: Intake): Designated sites

Designation	Site name
Sites of Special Scientific Interest (SSSI)	Upper Nene Valley Gravel Pits, The Nene Washes, Rutland Water, The Wash, Adventurer's Land, Bassenhally Pit, Castor Flood Meadows, Sutton Heath and Bog
Special Protection Areas (SPA)/ Ramsar	Nene Washes SPA and Ramsar, Rutland Water SPA and Ramsar, The Wash SPA and Ramsar
Special Areas of Conservation (SAC)	Nene Washes, The Wash and North Norfolk Coast
Local Wildlife Sites	36 sites present in the vicinity of the option

The River Trent was included as an option in the previous drought plan and the previous Environmental Report established a baseline for this water course. The River Trent is one of two major contributors to the Humber Estuary, which is a SPA, Ramsar site, SAC and SSSI. The Humber Estuary is over 50km downstream of the Hall abstraction point on the River Trent and is a macro-tidal, coastal-plain estuary. There are no other SPAs, Ramsar sites, or SACs, however there are 13 SSSIs within 5km of the River Trent downstream of the abstraction point. These are shown in **Table B.7**.

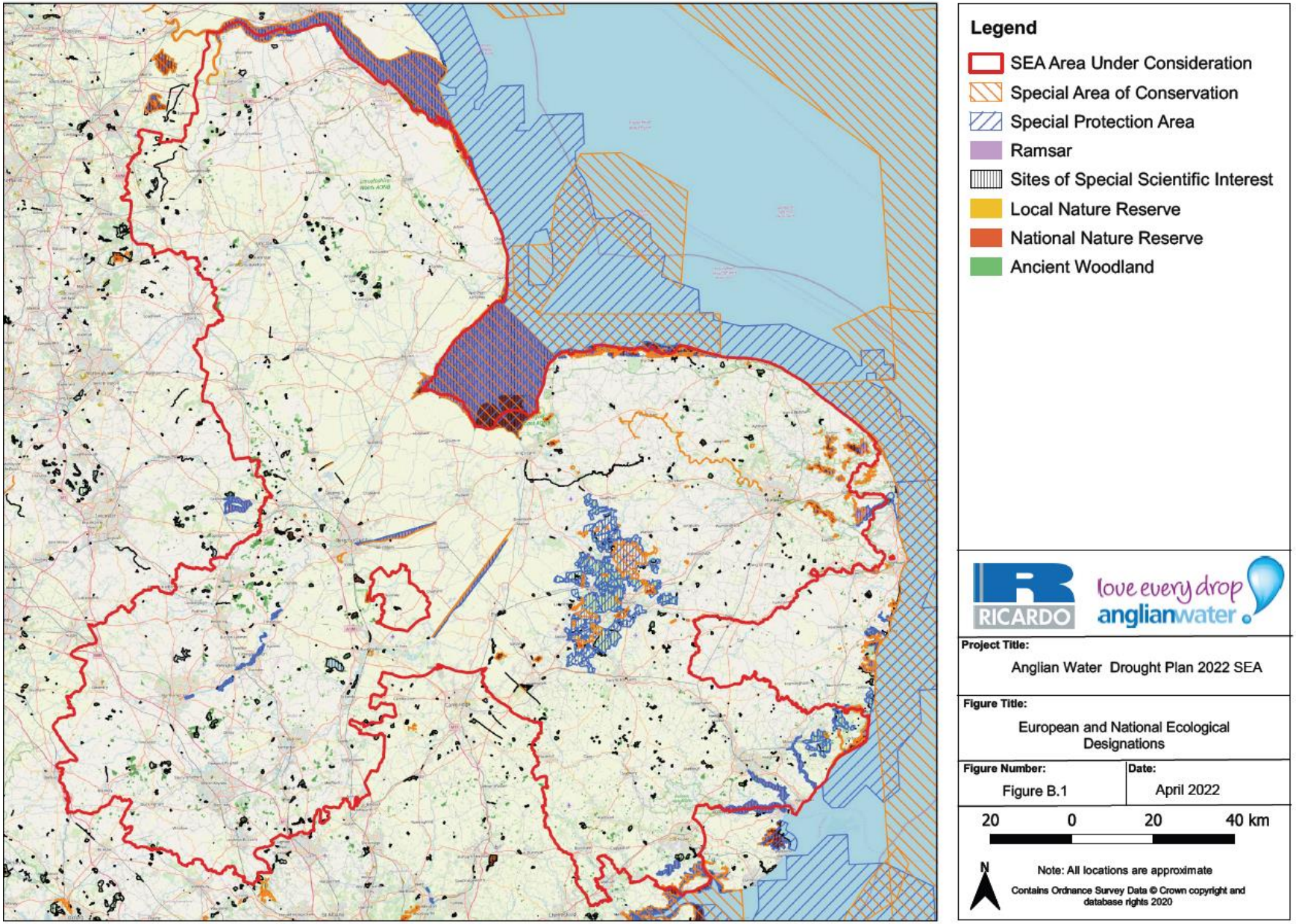
Table B.7 SSSI sites within 5km of the River Trent downstream of the abstraction point

SSSI Name	Area (ha)	Site Unit Condition	Distance from River Trent (km)
Ashton's Meadow	3.57	Unfavourable Recovering	4.4
Conesby (Yorkshire East) Quarry	0.92	Unfavourable No Change	4.61
Crowle Borrow Pits	4.93	Unfavourable Recovering	5.04
Hatfield Chase Ditches	44.20	Unfavourable Declining	4.87
Hewson's Field	0.49	Favourable	2.56
Laughton Common	54.72	Unfavourable No Change	1.88
Lea Marsh	27.56	Unfavourable No Change	0.10
Messingham Heath	17.77	Unfavourable Recovering	3.52

Mother Drain, Misterton	3.63	Unfavourable Recovering	0.17
Rush Furlong	0.48	Favourable	3.48
Scotton and Laughton Forest Ponds	48.32	Unfavourable No Change	3.05
Scotton Common	15.09	Unfavourable Recovering	4.97
Tuetoes Hills	12.50	Unfavourable Recovering	1.1

Source: Natural England: https://designatedsites.naturalengland.org.uk/SiteSearch.aspx

Ancient woodlands in England and Wales 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. Areas of ancient woodland are shown on **Figure B.1**.


Legend
SEA Area Under Consideration
Special Area of Conservation
Special Protection Area
Ramsar
Sites of Special Scientific Interest
Local Nature Reserve
National Nature Reserve
Ancient Woodland
RICARDO
love every drop
anglianwater
Project Title:
Anglian Water Drought Plan 2022 SEA
Figure Title:
European and National Ecological Designations
Figure Number:
Figure B.1
Date:
April 2022
20 0 20 40 km
N
Note: All locations are approximate
Contains Ordnance Survey Data © Crown copyright and database rights 2020

B.1.2 Flora and Fauna

Species and habitats of principal importance for the conservation of biodiversity in England are identified in the Natural Environment and Rural Communities (NERC) Act 2006 Section 41. There are 18 habitats[35] designated within the Natural Environmental and Rural Communities (NERC) Act within the Anglian Water SEA study area. These include reedbeds, fens and water meadows. Important water-related NERC species are listed in below.

- Otter
- Water vole
- Atlantic salmon
- European eel
- Sea/Brown trout
- River lamprey
- White clawed crayfish and
- 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

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). See the 'Water' topic for details on water quality, and **Table B.12** for the ecological condition of surface water bodies.

Drought options have the potential to affect biodiversity, flora and fauna due to the operational abstraction of water during times of water stress or due to impacts of any construction works required. Water abstraction and associated infrastructure can sometimes result in adverse effects on water-related sites. Impacts on biodiversity may include 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 sensitivity of environmental features that can be affected by implementing drought options is site specific. A drought is transient and the deployment of a drought option would only be for a limited period of time. Therefore, the duration of effects on sensitive features and reversibility post drought are important considerations.

B.1.2.1 Aquatic Ecology

[35] Species or habitats of principal importance for the conservation of biodiversity in England, identified in the Natural Environmental and Rural Communities (NERC) Act 2006 Section 41.

Data relating to the aquatic ecology of the watercourses that may be affected by the Drought Plan 2022 options have been collected as part of the previous SEA in support of the Environmental Assessment Reports (EARs) undertaken for the Drought Plan 2019. The Water Framework Directive (WFD) status of biological elements for each of the water bodies potentially affected by the Drought Plan 2022 options is presented in Section B.4.2. The EARs are currently being updated ahead of Drought Plan 2022 and these will inform the SEA.

European eel is recognised as a Species of Principal importance in the UK (NERC Act 2006, Section 41) and is a critically endangered as per the IUCN Red List, featured on the OSPAR Commission List of Threatened or Declining Species. European eel is present across the Anglian region, however, populations have been declining in recent years. Loss of habitat, presence of migration obstacles, entrainment and water pollution have been identified as key pressures for eel populations. Drought permit options have potential to changes water level and flow which may affect eel migration, passage and entrainment.

Atlantic salmon (Salmon salar) is also, a species of European importance as listed in Annexes II and V of the EU Habitat Directive. Changes in water level and flow as a result of the implementation of drought permit options may affect salmon migration, passage and entrainment.

B.1.3 Invasive Non-Native Species (INNS)

There has been a dramatic increase in the number of non-native species arriving into the UK over recent decades, as well as in the number of invasive species being established. There are approximately 2000 non-native species established in Britain, with the majority of in the terrestrial environment and smaller numbers in marine and freshwater environments. Anglian Water are working with colleagues and other organisations such as the GB Non-Native Species Secretariat, to help reduce the impacts on INNS. Their staff are biosecure when visiting sites and report INNS when they find them. Water parks in the region have wash down facilities so visitors, including anglers, can clean their equipment. Anglian Water have also set up an invasive species fund as part of their commitment to protect and enhance rivers and wetlands across the region through supporting projects that target the prevention or management of INNS.

Implementation of Anglian Water's current drought plan options are not expected to increase in the distribution of INNS. More extreme supply side options could potentially have impacts on INNS distribution and an assessment of this risk would be required before implementation. Non-native species cause significant adverse impacts, including out-competing native species and spreading disease. The UK Government 2015 strategy on invasive non-native species[36] builds on previous strategies to provide a framework for coordinated action to prevent spread and work to eradicate species across the UK. The distribution of INNS will be assessed in the SEA report and the spread of invasive species forms a key question with regards to biodiversity in Section 3.1.

B.1.4 Future Baseline

It is not expected that many additional sites will be designated under international or national legislation, with the focus therefore on achieving the conservation objectives set for each of these sites. A range of measures are included in the management plans for each site to contribute to these objectives and,

[36] Defra (2015) The Great Britain invasive non-native species strategy

assuming sufficient resources are in place, it is likely that the condition of these sites will improve over the next two or three decades to reach the objectives. These timescales recognise the time required for environmental changes to arise following positive interventions. A similar trend is likely for achievement of objectives associated with the NERC priority habitats.

The number of locally designated sites may increase slightly in response to growing community activities and the development of local environmental initiatives. An improving trend in condition of these sites is also anticipated with greater resources (particularly voluntary resources) devoted to their protection and enhancement.

The Defra 25 Year Environment Plan[37] includes a commitment to restore restoring 75% 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 'Biodiversity Net Gain' approach to development, an approach introduced into national planning policy in 2019 and which will be mandated by the upcoming Environment Bill.

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 likely 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[38]. 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.

[37] HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment. *Accessed at* https://www.gov.uk/government/publications/25-year-environment-plan. Accessed 09 June 2020.
[38] Pateman & Hodgson (2015) Biodiversity Climate change impacts report card technical paper. Available from: http://www.nerc.ac.uk/research/partnerships/lwec/products/report-cards/biodiversity/papers/source06/

B.2 Population and Human Health

B.2.1 Population

Anglian Water serves one of the fastest growing parts of the UK, with a predicted 20 percent growth in population over the next 25 years, compared with 2011-12 population levels[39]. This is reflected in the population data below (**Table B.8**), which shows increases in the resident population within the majority of Anglian Water's supply area between 2011 and 2019. The increase for both these regions is 6.4% and 6.6%, which is slightly above the national average of 6.0%.

Table B.8 describes the latest population projections for the main regions covered by Anglian Water's water supply area. The East and East Midlands regions forecast a growth in population up to 2028 (compared to mid-2019 estimates) of 4.4% and 6.2%, respectively. Projected population growth in the East region is comparable with the national average, meanwhile, growth in the East Midlands region is projected to be considerable. Households in England are projected to increase by 7.1% over the 10 year period from 2018 to 2028[40] and the East of England and East Midlands regions project greater growth in the number of households of 7.2% and 8.7%, respectively. The East Midlands region has the second greatest growth projections in England, behind the South West.

It is important to note that the population estimates are calculated based on whole Local Planning Authority (LPA) Districts within the regions and the boundaries of Anglian Water's water supply areas are not consistent with District boundaries. They are also based on projections for household formation, migration and development trends that are subject to change.

Table B.8 Population statistics by region and country

Region	Usual resident population				
	2011 Census[41]	Mid-2019 Estimate[42]	% change	Predicted population in mid-2028[43]	Predicted % change from mid-2019
East	5,862,418	6,236,072	6.37	6,512,372	4.43
East Midlands	4,537,448	4,835,928	6.58	5,138,039	6.24
England	**53,107,169**	**56,286,961**	**5.99**	**58,751,651**	**4.37**

B.2.2 Health

The DP has the potential to influence quality of life, including human health, well-being, amenity and community, through actions to maintain essential water supplies during drought conditions. There could be beneficial (e.g. actions to provide additional supply of water will help safeguard public health) or adverse impacts (e.g. noise and disruption from temporary infrastructure required to pump water). The

[39] Anglian Water (2019) Water Resources Management Plan 2019, December 2019.
[40] ONS (2020) Household Projections in England: 2018-based, June 2020.
[41] Office for National Statistics (2012) 2011 Census: Population and Household Estimates for England and Wales, March 2011
[42] Office for National Statistics (2020) Population estimates for the UK, England and Wales, Scotland and Northern Ireland: mid-2019, using April 2020 local authority district codes
[43] Office for National Statistics (2019) National population projections: 2018-based

Drought Plan also sets out measures to ensure that essential water supplies can be maintained to all of Anglian Water's customers, thereby protecting public health in drought conditions.

An overview of general health is provided in **Table B.9**, using information collected as part of the 2011 census. General health in the East of England region is slightly above that which is reported nationally in general, however the East Midlands region is slightly worse overall.

Table B.9 General health by region (2011)[44]

County, district, or unitary authority	General health very good (%)	General health good (%)	General health fairly good (%)	General health not good (%)	General health very bad (%)
East of England	47.2	35.2	12.9	3.6	1.0
East Midlands region	45.3	35.1	14.0	4.3	1.2
England	47.2	34.2	13.1	4.2	1.2

Table B.10 provides various indicators which give an indication to the general level of health in each area. Life expectancy, for both males and females, is greater in the East of England region compared to national levels. Under 75 mortality rates are much lower in the East of England region. Data for the East Midlands region show health in this region is slightly below that of England.

Table B.10 Health Indicators by region[45]

County, district, or unitary authority	Life expectancy at birth (2017-2019)		Under 75 mortality rate from all causes, per 100,000 (2016-2018)
	Male	Female	
East of England	80.5	83.9	302
East Midlands	79.5	82.9	334
England	79.8	83.4	330

B.2.3 Economy

B.2.3.1 East of England

The East of England has the second highest employment rate of any English region in the UK, following the South East. The latest employment rate (July to September 2020) is 77.65% compared with a UK average of 75.3%. Employment rate was down 0.88% compared with the same period for 2019 (**Table B.11**), this may be party attributed to the COVID19 pandemic.

[44] Office for National Statistics (2011) 2011 Census: General Health in England and Wales.
[45] Public Health England (2020) Public Health Profiles. 2020 https://fingertips.phe.org.uk. Accessed 11 December 2020 © Crown copyright 2020

In 2018 the gross disposable household income (GDHI) per head in the East of England was £22,205 and is also the third highest in England.

The latest figures from 2018 show that the East of England is responsible for 8.6% of the UK's Gross Value Added (GVA) with a total GVA of £164.6 million. The 2018 sub-regional data shows that Hertfordshire was the largest contributor to the East of England with a GVA at £40.7 million. Real estate activities accounted for the largest proportion of GVA in 2018 at 14.1% followed by wholesale and retail trade and repair of motor vehicles with 12.7%. The region was responsible for 17% of the England's agriculture, forestry, and fishing GVA, making it the second highest contributor for that sector in England behind the South West.

B.2.3.2 East Midlands

The latest figures (July to September 2020) show that the East Midlands has an employment rate of 75.0% which is the fifth highest of the English regions. Employment rate was down 2.19% compared with the same period for 2019 (**Table B.11**), this is double that of the value for England and may be attributed to the COVID19 pandemic.

The GDHI for the East Midlands in 2018 was £18,277 per head and was the sixth highest in the England and below the national GDHI of £21,609.

The East Midlands had a GVA of £109 million in 2018, accounting for 5.7% of the UK's total GVA. Leicestershire and Rutland were responsible for the highest amount of GVA in the East Midlands in 2018 with £18.4 million. The highest proportion of the region's GVA in 2018 was a result of wholesale and retail trade and the repair of motor vehicles at 13.2% followed by real estate activities with 11.7%. The East Midlands is responsible for 13% of the UK's food, beverage, and tobacco manufacturing sector and 18% of the textiles and wearing apparel manufacturing sector. The region was the largest GVA contributor for those sectors in 2018 out of any of the English regions.

Table B.11 Employment rate estimates for people aged 16-64 years, by region.

Region	July to September 2020	July to September 2019	% change from 2019 to 2020
East of England	77.65	78.34	-0.88
East Midlands	75.03	76.71	-2.19
England	75.7	76.5	-1.05

B.2.4 Future Baseline

Population in the Anglian region is projected to grow by 20% over the next 25 years (compared with 2011/12 population levels) imposing a significant pressure on Anglian Water's supply-demand balance with demand forecasted to increase by 109Ml/d by 2045[46]. There are a number of WRZs with

[46] Anglian Water (2019) Water Resources Management Plan 2019, December 2019.

particularly high levels of forecast growth, namely Nottinghamshire, South Lincolnshire and Thetford WRZs.

The demand for new housing in England is estimated to be as high as 340,000 new homes needed per year (over a 15 year period) as a result of the changing population as well as a large backlog of need (estimated to be around 4 million)[47].

In response to recent studies access to the recreational resources, green spaces and the historic environment will have greater importance in future planning[48.] For example the National Ecosystem Assessment and the Marmot Review, *Fair Society, Healthy Lives*, demonstrate the positive impact that nature has on mental and physical health and as a result the Government intends to establish a Green Infrastructure[49] Partnership with civil society to support the development of green infrastructure in England. 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[50].

However, the result of the UK's referendum to leave the European Union (EU) and ongoing Covid-19 pandemic may lead to greater uncertainties regarding a range of population and health indicators such as; population and housing growth, health impacts, employment rates and the economy (including the impact on tourism).

[47] Bramley, G. for Crisis (2018) Housing supply requirements across Great Britain: for low-income households and homeless people, December 2018
[48] Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper
[49] Green infrastructure is a term used to refer to the living network of green spaces, water and other environmental features in both urban and rural areas.
[50] Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report.

B.3 Material Assets

B.3.1 Water Use

Anglian Water operate 1,257 water and wastewater treatment works, which is around 25 percent of all the works in England and Wales[51]. Anglian Water has 112,833km of water and wastewater pipes supplying and transporting water across an area of 27,500km^2.

In 2019/20, Anglian Water achieved an industry leading leakage performance of 182 Ml/d and has further ambitions to reduce this further, by 22% by 2025 and 42% by 2045 which corresponds to 142Ml/d and 106Ml/d, respectively

B.3.2 Resource Use and Waste

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, biodegradeable municipal waste[52] (BMW) to landfill figures have almost halved over the period 2010 to 2018 (10,339 thousand tonnes to 5,598 thousand tonnes) and household recycling rates have climbed to 44% (2018) from 11% (2000); meanwhile, waste generated by commercial and industrial activities rose by 1.1 million tonnes between 2017 and 2018[53]. 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 is 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 facilities. Waste streams include commercial and industrial waste (C&I) (statistics include waste arisings from the power and utilities sector, which includes water supply and sewage removal), and also hazardous wastes.

Drought options which require infrastructure may result in the use of raw materials and the production of waste. The operation of DP options may result in additional chemical use and the production of waste through water treatment. Raw water (rainwater, groundwater, water from surface water bodies) could be included in the water treatment, which requires more intense levels of treatment.

B.3.3 Future Baseline

The Environment Agency recently published the national framework for water resources[54] which included ambitious targets to reduce average per capita consumption (PCC) to 110 litres per person per day (l/p/d) by 2050. In its 2019 WRMP, Anglian Water set an ambitious target for per capita consumption (PCC) and by 2045 expects this to be 120 l/h/d (litres per head, per day) which is a 12% reduction compared with 2017/18 (136 l/h/d) and one of the lowest in England and Wales. Anglian Water plan to continue the roll out of smart water meters across the region together with a range of

[51] https://www.anglianwater.co.uk/about-us/who-we-are/ Accessed 11 December 2020
[52] The fraction of municipal waste that will decompose within a landfill site to produce methane, a potent greenhouse gas.
[53] Defra (2020) UK Statistics on Waste, Statistical Release, March 2020.
[54] Environment Agency (2020) Meeting our future water needs: a national framework for water resources, March 2020.

household water efficiency and conservation activities. Anglian Water will reassess this programme in the next iteration of the WRMP to take account of the new target for PCC.

Anglian Water put demand management at the forefront of their water resources strategy, with leakage reduction targets of 22% to 142Ml/d by 2025 and by 42% to 106Ml/d (from 182Ml/d in 2019/20).

The Government's 25 year environment plan includes goals for increasing resource efficiency and minimising waste, including working towards the elimination of all avoidable waste by 2050, and all avoidable plastic waste by the end of 2042. The government has also developed a new national Resources and Waste strategy to look at the whole life-cycle of products in order to maximise the value of our resources during their lifetime. The Waste Strategy for England[55], published in 2018, sets out measures to help society move away from a 'take, make, use and throw' approach to resources and materials and instead waste less and reuse, recycle and repair more. Targets for waste include; 50% recycling rate for household waste by 2020, 75% recycling rate for packaging by 2030, 65% recycling rate for municipal solid waste by 2035 and municipal waste to landfill at 10% or less by 2035.

[55] HM Government (2018) Our waste, our resources: a strategy for England

B.4 Water

B.4.1 Water availability

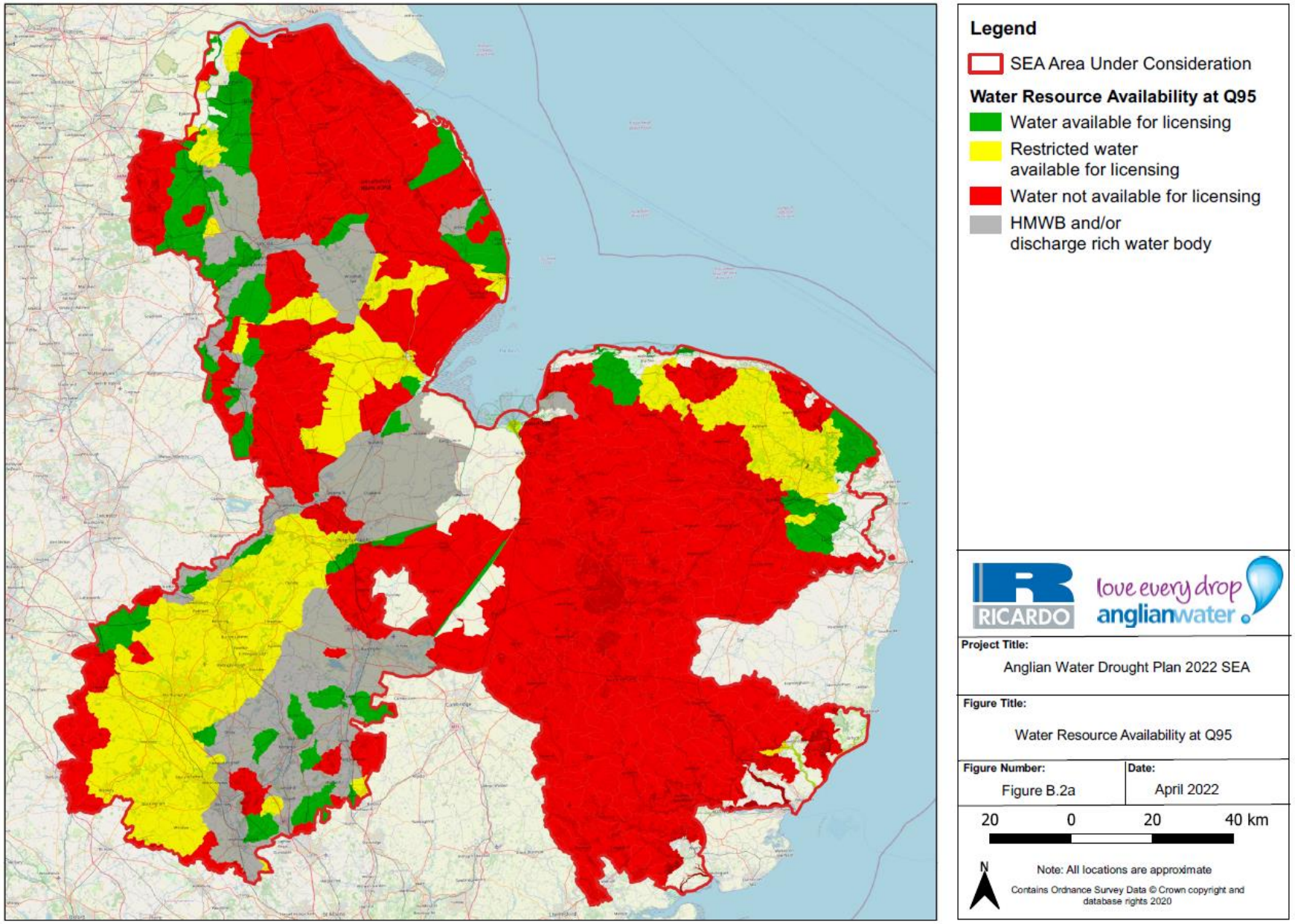
The Environment Agency is responsible for managing water resources in England to ensure there is enough water for people, industry and agriculture as well as a healthy environment. Abstraction Licensing Strategies (ALS) set out how water resources will be managed within a catchment area. Each strategy provides information on:

- what resources are available (where and when)
- what conditions may apply to new licences
- whether time limited licences will be replaced with the same conditions
- what changes may need to be made to existing non-time limited licences

Additionally, the local impacts of any proposed abstraction are considered to ensure the rights of existing water users and the environment is protected. ALS areas are based on river catchment boundaries and overlap with Anglian Water's supply area.

The results of the most recent ALSs, completed in 2019, have been mapped onto WFD Cycle 2 boundaries and are represented by different water resource availability colours showing the availability of water resource for further abstraction. **Figure B.2a** shows the Environment Agency representation of resource availability based on the worst downstream water body at low flows (the flow percentile called Q95), focusing on the Anglian River Basin District and Anglian Water supply area. The availability of water varies throughout the SEA study area (**Figure B.2a and B.2b**). The baseline information on the surface and ground water availability in the study area is provided by the following documents:

- Broadland abstraction licensing strategy
- Cam and Ely Ouse abstraction licensing strategy
- Essex abstraction licensing strategy
- East Suffolk abstraction licensing strategy
- Idle and Torne abstraction licensing strategy
- Lower Trent and Erewash abstraction licensing strategy
- Nene abstraction licensing strategy
- North Norfolk abstraction licensing strategy
- Old Bedford abstraction licensing strategy
- Steeping, Great Eau and Long Eau abstraction licensing strategy
- Upper Ouse and Bedford Ouse abstraction licensing strategy
- Welland abstraction licensing strategy
- Witham abstraction licensing strategy


Legend
SEA Area Under Consideration
Water Resource Availability at Q95
Water available for licensing
Restricted water available for licensing
Water not available for licensing
HMWB and/or discharge rich water body
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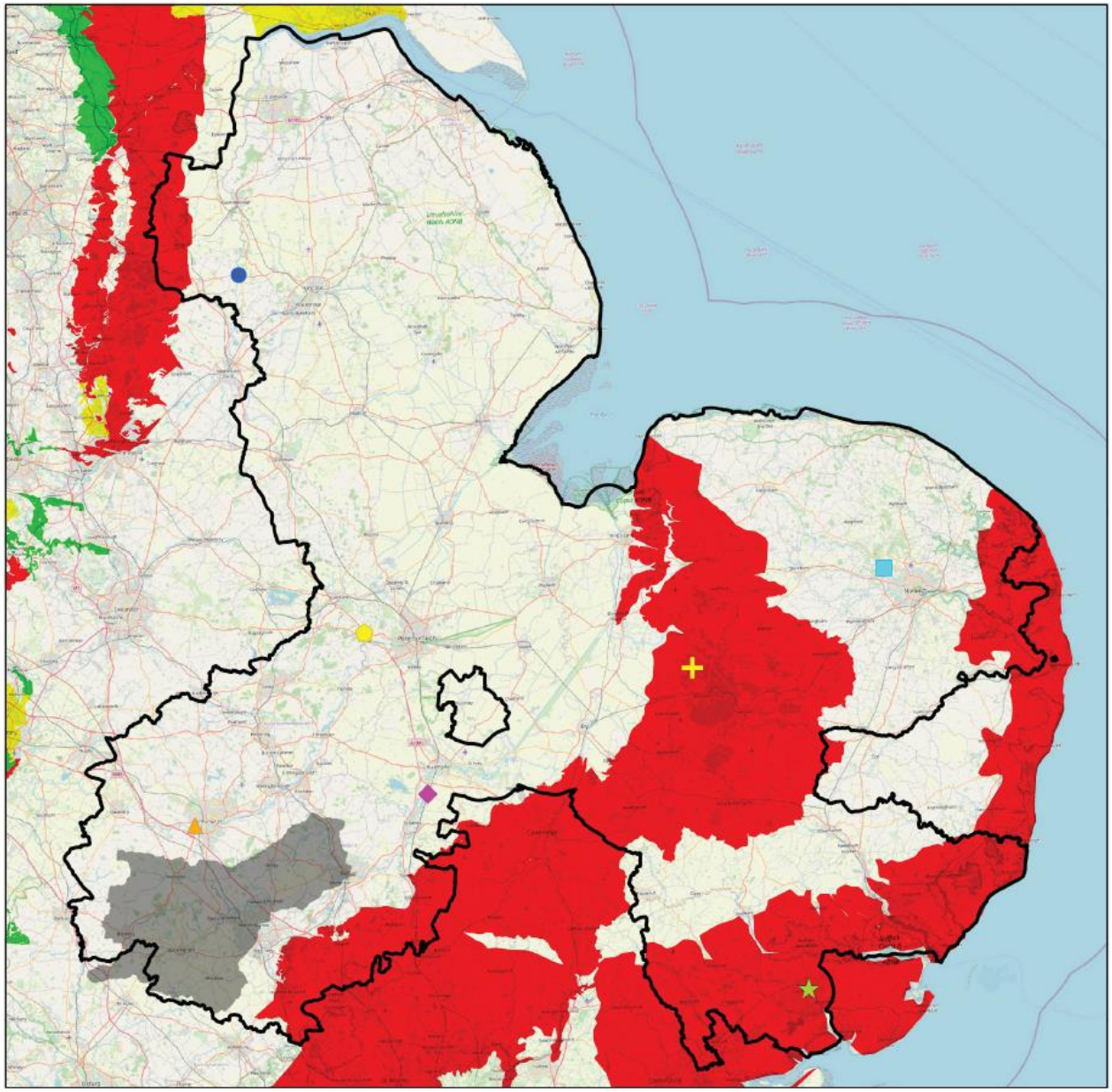
Project Title:
Anglian Water Drought Plan 2022 SEA
Figure Title:
Water Resource Availability at Q95
Figure Number:
Figure B.2a
Date:
April 2022
20 0 20 40 km
N
Note: All locations are approximate
Contains Ordnance Survey Data © Crown copyright and database rights 2020



Legend

SEA Area Under Consideration

Ground Water Management Units (GWMUs) Water Resource Availability

- Case by case basis
- Restricted water available
- Water available
- Water not available

Drought Options

- Colne
- Costessey (Wensum)
- Great Ouse
- Nene (Pitsford)
- Nene (Rutland)
- Trent
- Wellington Wellfield

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Project Title:
Anglian Water Drought Plan 2022 SEA

Figure Title:
Ground water availability in SEA study area

Figure Number:	Date:
Figure B.2b	April 2022

20 0 20 40 km

N

Note: All locations are approximate

B.4.2 Water Framework Directive

In the context of the WFD, the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. The Anglian Water supply area lies almost entirely within the Anglian river basin district (RBD). The Anglian River Basin Management Plan[56] (RBMP) provides a framework for protecting and enhancing the benefits provided by the water environment. The Anglian RBMP was last updated in 2015.

The Anglian river basin district covers 27,900km^2, extending from Lincolnshire in the north to Essex in the south and from Northamptonshire in the west to the east Anglian coast. **Figure B.3** illustrates the surface water features in the Anglian Water SEA study area.

Water quality is classified according to several quality elements in line with the requirements of the Water Framework Directive (WFD).

For surface waters, there are two separate status classifications for water bodies: ecological and chemical. For a water body to be in overall 'good' status both ecological and chemical status must be at least 'good'. Biological status classification considers the condition of biological quality elements, e.g. aquatic invertebrates, plants and fish, the morphology of the habitat available, concentrations of supporting physico-chemical elements e.g. oxygen or ammonia and concentrations of specific pollutants.

In the most recent 2019 WFD classifications, of 603 surface water bodies within the Anglian RBD, with regard to their ecological status or potential 3.6% were classified as 'bad', 17.4% as 'poor', 71.0% as 'moderate', 7.8% as 'good' and 0% as 'high'. All 603 surface water bodies failed for their chemical status (see **Table B.12**).

Table B.12 Ecological and Chemical 2019 Cycle 2 classification for surface waters - Anglian River Basin District

No. of water bodies	Ecological status or potential					Chemical Status	
	Bad	Poor	Mod	Good	High	Fail	Good
603	22	105	428	47	0	603	

[56] Environment Agency (2015) Part 1: Anglian river basin district. River basin management plan. Updated December 2015.

Legend

- SEA Area Under Consideration
- Main Rivers
- WFD Surface Water Bodies
- WFD Lake Water Bodies

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Project Title:
Anglian Water Drought Plan 2022 SEA

Figure Title:
Surface Water Features

Figure Number:	Date:
Figure B.3	April 2022

20 0 20 40 km

N

Note: All locations are approximate

For groundwater there are two separate classifications for groundwater bodies: chemical status and quantitative status. Each must be reported in addition to the overall groundwater body status. 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. Of the 31 groundwater bodies, 17 of them are classified as good for quantitative status (55%) and 29 for chemical status (52%) (see **Table B.13**).

Table B.13 Chemical and quantitative 2019 Cycle 2 classification for groundwaters – Anglian River Basin District

No. of water bodies	Quantitative status		Chemical status	
	Poor	Good	Poor	Good
31	14	17	15	16

A summary of the WFD data for each waterbody is provided for each drought option below in **Tables B.14** to **B.20.**

Table B.14 River Colne Augmentation (Ardleigh Reservoir) WFD data

Waterbody	Type	Hydro morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
Colne u/s Gt. Yeldham	River	Not designated artificial or heavily modified	Nitrates Directive	Poor	Good by 2027
Colne Gt. Yeldham – Doe's Corner	River	Heavily modified	Nitrates Directive	Poor	Moderate by 2027
Colne d/s Doe's Corner	River	Heavily modified	Nitrates Directive; Drinking Water Protected Area; Urban Waste Water Treatment Directive; Safeguard Zone	Moderate	Disproportionate burdens. No known technical solution is available
Pebmarsh Brook	River	Heavily modified	Nitrates Directive	Moderate	Good by 2015
Roman River	River	Heavily modified	Nitrates Directive	Moderate	Unfavourable balance of costs and benefits. Disproportionate burdens. Action to get biological element to good would have significant

					adverse impact on use

Source EA Catchment Data Explorer

Table B.15 River Wensum: Costessey Groundwater Source WFD Data

Waterbody	Type	Hydro morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
Wensum US Norwich	River	Heavily modified	Nitrates Directive; Drinking Water Protected Area; Habitats and Species Directive; Safeguard Zone; Urban Waste Water Treatment Directive	Moderate	Disproportionate burdens. No known technical solution is available
Wensum DS Norwich	River	Heavily modified	Nitrates Directive; Safeguard Zone; Drinking Water Protected Area; Urban Waste Water Treatment Directive	Moderate	Good by 2027. Cause of adverse impact unknown.
Tud	River	Heavily modified	Habitats and Species Directive; Nitrates Directive	Moderate	Unfavourable balance of costs and benefits
Yare (Wensum to tidal)	River	Heavily modified	Habitats and Species Directive; Conservation of Wild Birds Directive; Nitrates Directive; Urban Waste Water Treatment Directive	Moderate	No known technical solution is available
Spixworth (and Dobbs) Beck	River	Heavily modified	Habitats and Species Directive; Conservation of Wild Birds Directive	Moderate	Good by 2027
Broadland Rivers Chalk and Crag Groundwater Body	Groundwater Body	Not applicable	Nitrates Directive; Drinking Water Protected Area	Poor	Good by 2027
Costessey Pits	Lake	Artificial	Drinking Water Protected Area; Safeguard Zone	Moderate	Good by 2027

Source EA Catchment Data Explorer

Table B.16 River Great Ouse: Intake (Grafham Water) WFD Data

Waterbody	Type	Hydro morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
Ouse (Roxton to Earith)	River	Heavily modified	Nitrates Directive; Urban Waste Water Treatment Directive; Drinking Water Protected Area; Conservation of Wild Birds Directive; Safeguard Zone; Habitats and Species Directive	Moderate	Unfavourable balance of costs and benefits. Disproportionate burdens.
Old West River	River	Heavily modified	Nitrates Directive; Urban Waste Water Treatment Directive	Moderate	Unfavourable balance of costs and benefits. Disproportionate burdens.
Ely Ouse (South Level)	River	Artificial	Nitrates Directive; Urban Waste Water Treatment Directive	Moderate	Unfavourable balance of costs and benefits. Disproportionate burdens.
Old Bedford River / River Delph (inc The Hundred Foot Washes)	River	Artificial	Nitrates Directive; Conservation of Wild Birds Directive; Habitats and Species Directive	Moderate	Good by 2027
Great Ouse	Transitional Water	Heavily modified	Nitrates Directive; Urban Waste Water Treatment Directive; Conservation of Wild Birds Directive; Habitats and Species Directive; Shellfish Water Directive	Poor	Moderate by 2021
Wash Inner	Transitional Water	Not designated artificial or heavily modified	Shellfish Water Directive; Habitats and Species Directive; Conservation of Wild Birds Directive; Urban Waste Water	Moderate	Unfavourable balance of costs and benefits Cause of adverse impact unknown

Waterbody	Type	Hydro morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
			Treatment Directive; Nitrates Directive		
Wash Outer	Coastal Water	Not designated artificial or heavily modified	Shellfish Water Directive; Habitat and Species Directive; Conservation of Wild Birds Directive; Bathing Water Directive	Moderate	Unfavourable balance of costs and benefits. Background condition

Source EA Catchment Data Explorer

Table B.17 River Nene: Intake (Pitsford Reservoir) WFD Data

Waterbody	Type	Hydro morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
Nene - conf Whilton Branch to conf Brampton Branch	River	Not designated artificial or heavily modified	Nitrates Directive; Safeguard Zone; Drinking Water Protected Area	Poor	Moderate by 2027
Nene - conf Brampton Branch to conf Ise	River	Heavily modified	Nitrates Directive; Conservation of Wild Birds Directive; Urban Waste Water Treatment Directive	Moderate	Disproportionate burdens. No known technical solution is available. Background condition
Nene conf Ise to Islip	River	Heavily modified	Nitrates Directive; Conservation of Wild Birds Directive; Urban Waste Water Treatment Directive	Moderate	Disproportionate burdens. No known technical solution is available
Nene - Islip to tidal	River	Heavily modified	Conservation of Wild Birds Directive; Nitrates Directive; Safeguard Zone; Drinking Water Protected Area; Urban Waste Water Treatment Directive	Moderate	Unfavourable balance of costs and benefits. Disproportionate burdens

Source EA Catchment Data Explorer

Table B.18 Wellington Wellfield: Intake WFD Data

Waterbody	Type	Hydro morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
Wissey-Lower	River	Heavily modified	Nitrate Directive; Drinking Water Protected Area; Urban Waste Water Treatment Directive; Safeguard Zone	Moderate	Disproportionate burdens. No known technical solution is available
Stringside Stream	River	Heavily modified	Nitrates Directive	Poor	Good by 2027
Old Carr Stream	River	Not designated artificial or heavily modified	Nitrates Directive	Moderate	Good by 2021
Gadder	River	Not designated artificial or heavily modified	Habitat and Species Directive; Nitrates Directive	Moderate	Good by2027
Little Ouse River	River	Heavily modified	Nitrates Directive	Moderate	Disproportionate burdens. No known technical solution is available

Source EA Catchment Data Explorer

Table B.19 River Nene: Intake (Rutland Water) WFD Data

Waterbody	Type	Hydro morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
Nene - Islip to tidal	River	Heavily modified	Conservation of Wild Birds Directive; Nitrates Directive; Safeguard Zone; Drinking Water Protected Area; Urban Waste Water Treatment Directive	Moderate	Unfavourable balance of costs and benefits. Disproportionate burdens
Mortons Leam	River	Artificial	Habitats and Species Directive; Conservation of Wild Birds Directive	Moderate	Good by 2027
Nene	Transitional Water	Heavily modified	Conservation of Wild Birds Directive; Habitats and Species Directive; Shellfish Water Directive	Moderate	Unfavourable balance of costs and benefits; Disproportionate burdens

Waterbody	Type	Hydro morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
Rutland Water	Lake	Artificial	Conservation of Wild Birds Directive; Drinking Water Protected Area; Nitrates Directive; Safeguard Zone; Urban Wastewater Treatment Directive	Moderate	Unfavourable balance of costs and benefits; Disproportionate burdens

Source EA Catchment Data Explorer

Table B.20 River Trent: Hall WTW WFD Data

Waterbody	Type	Hydro-morphological designation	Protected areas (directives)	Overall classification (2019 Cycle 2)	Overall waterbody objective
Trent from Soar to The Beck	River	Heavily modified	Nitrates Directive; Urban Waste Water Treatment Directive; Bathing Water Directive;	Moderate	Unfavourable balance of costs and benefits; Disproportionate burdens
Trent from Carlton-on-Trent to Laughton Drain	River	Artificial	Urban Waste Water Treatment Directive; Nitrates Directive; Drinking Water Protected Area	Moderate	Good by 2027
Humber Upper	Transitional Water	Heavily modified	Conservation of Wild Birds Directive; Habitats and Species Directive; Nitrates Directive; Urban Waste Water Treatment Directive	Moderate	Unfavourable balance of costs and benefits; Disproportionate burdens; Cause of adverse impact unknown

Source EA Catchment Data Explorer

B.4.3 Flood Risk

The Anglian Water area is one of the lowest lying and flattest regions in the country and therefore coastal and river flood risk is a significant concern. The Fens, an artificially drained area, is located within the Anglian Water area, with Holme Fen being the lowest point in the UK at approximately 2.75m below sea level[57].

The majority of the area is designated as Flood Zone 1, however there is a large area located within Flood Zone 3 around the Ely, South Fenland, Bourne and East Lincolnshire Water Resource Zones

[57] Cambridgeshire County Council, Flood Risk Strategy (2015)

(WRZ)[58]. There are also pockets of Flood Zone 2 across the Anglian Water area. The flood risk zones which related to fluvial and tidal flood risk are defined by the

Environment Agency as:

- Flood Zone 1: Areas with low probability of flooding
- Flood Zone 2: Areas with medium probability of flooding
- Flood Zone 3: (a) Areas with high probability of flooding, (b) functional flood plain (where water regularly flows when overtopping river banks)

B.4.4 Future Baseline

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 2021 or 2027. The primary objective in the short-term is to ensure no deterioration in status between status classes: the 2015 water body classification is the baseline from which deterioration between classes is assessed; no deterioration between status classes is permitted unless certain and specific conditions apply.

The recently published national framework for water resources 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. In the East, it is anticipated that an additional 570Ml/d of public water supply will be required, with drought resilience responsible for almost half of this. Additionally, the East has the greatest demand from other users with 444 Ml/d required, 64% of which is for the agricultural industry.

Anglian Water have collaborated with neighbouring water companies and other sectors to form Water Resources East (WRE) and will be required to produce a Regional Plan to build resilience to a range of uncertainties and future scenarios. This plan will set out a preferred plan of options for the region that delivers best value to customers, society and the environment and should include other sectors beyond public water supply. The final plan will be produced by 2023 and will directly feed into the next water company WRMPs.

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report[59] draws together and interprets the evidence gathered by CCRA regarding current and future threats and opportunities for the UK posed by the impacts of climate change up until 2100. The assessment identified several risk areas for climate change risks associated with the water environment, including:

- Reduced water availability in the summer, combined with increased water demand from a growing population, likely to challenge the ecological health of rivers and lakes
- Major supply-demand deficits as a result of increased temperatures, changing weather patterns and population growth, posing a risk to public water supplies from drought and low river flows.
- Increased frequency and severity of rainfall and flooding events represents the most significant climate change risks to UK infrastructure and the number of assets exposed to significant levels of flood risk could double by the 2080s

[58] UK Government - Flood Map for Planning
[59] Committee on Climate Change (2017) The UK Climate Change Risk Assessment 2017 Evidence Report

- 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.

The NPPF[60] states that inappropriate development in areas at risk of flooding (in Flood Zone 1[61], Flood Zone 2[62], Flood Zone 3a[63] 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 without increasing flood risk elsewhere, as defined in the Technical Guidance to the NPPF[64]. 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 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).

[60] MHCLG (2019) National Planning Policy Framework: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf
[61] Low probability of river or sea flooding (<0.1%) which has critical drainage problems
[62] Medium probability of river (1%-0.1%) or sea flooding (0.5%-0.1%)
[63] High probability of river (>1%) or sea flooding (>0.5%)
[64] MHCLG (2014) Flood Risk and Coastal Change, Technical guidance to the National Policy Planning Framework https://www.gov.uk/guidance/flood-risk-and-coastal-change (Accessed 9 June 2020)

B.5 Soil, Geology and Land Use

B.5.1 Land Use and Soils

In 2015, more than 50% of the Anglian region is used for agriculture and horticulture[65]. As of 2018, the total farmed area of the East of England region (which makes up the majority of the Anglian Water supply area) was 1.4 million ha, contributing to 15% of England's total farmed area.

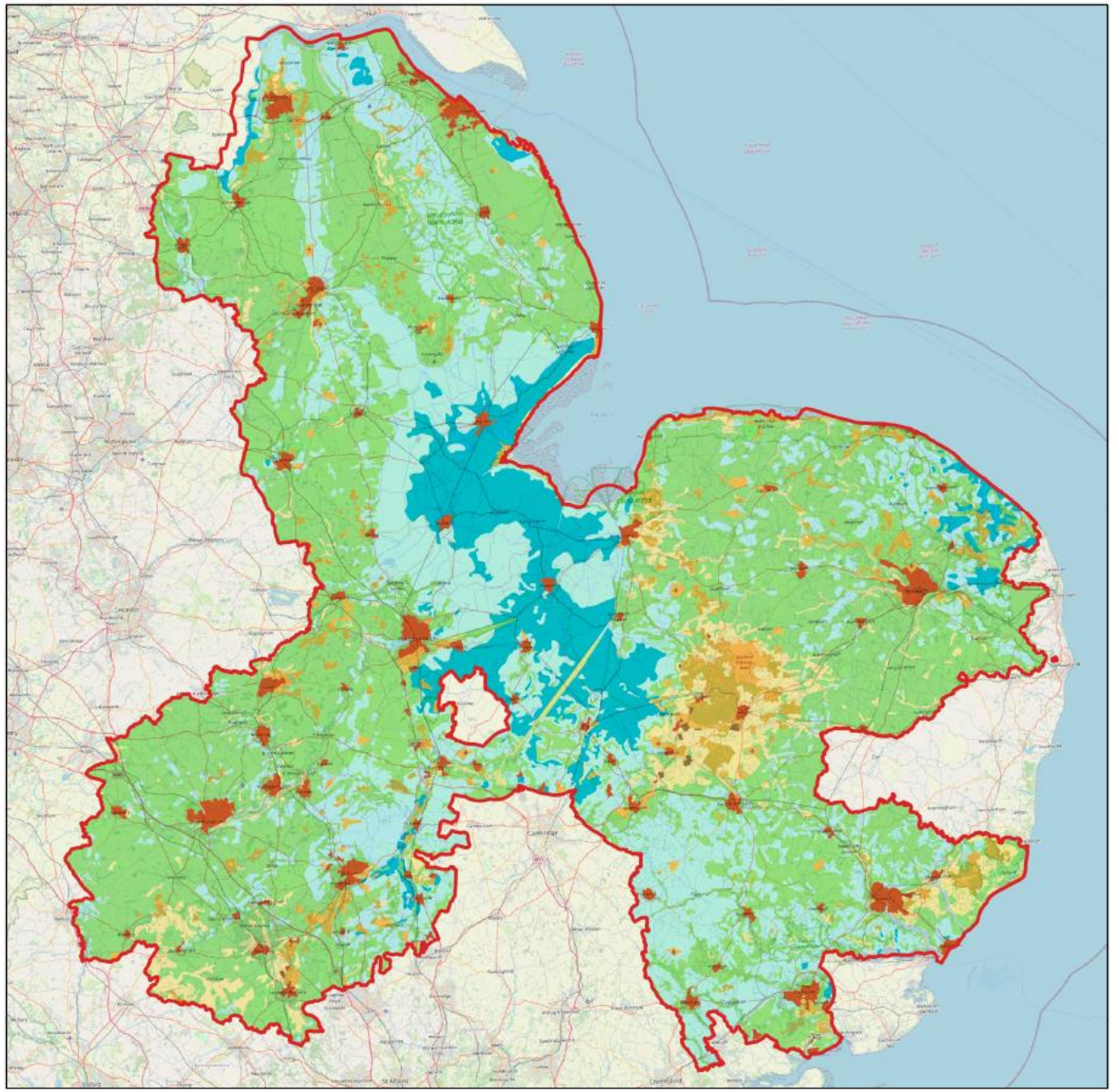
Agricultural Land Classification (ALC) is a system used in England and Wales to grade the quality of land for agricultural use, according to the extent by which physical or chemical characteristics impose long-term limitations. The system classifies land into five grades where grades 1, 2 and 3 are considered the best and most versatile land. This data is provided by Natural England, who last released provisional grades in May 2020. **Figure B.4** illustrates that the study area contains a significant amount of good quality agricultural land, with 25% at Grade 2 and 53% at Grade 3. The region contains some of the best and most versatile agricultural land in England, and much of the soil is derived from silt and peat deposits providing highly fertile soils. This helps support agriculture, an important activity not only in terms of land use, but also for the economy of the region. Cereals, rapeseed and sugar beet make up the majority of the arable crops grown.

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. Data on contaminated land are compiled by the British Geological Society[66].

Minerals Safeguarding Areas (MSAs) are designated by Mineral Planning Authorities for areas that include known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development.

Peatlands including raised bogs and lowland fens, store large amounts of carbon in peat, which has built up over millennia because of the slow rates of decomposition of plant material in waterlogged conditions. This habitat is one of the most carbon-rich ecosystems on earth and the UK's peatlands store an astonishing 4500 million tonnes of carbon[67]. Unfortunately, many are in poor condition in England and releasing carbon. Natural England are working to restore peatlands directly on the sites they manage, and advising other landowners on how to protect this vital ecosystem.

[65] [65] Environment Agency (2015) Part 1: Anglian river basin district. River basin management plan. Updated December 2015.
[66] https://data.gov.uk/dataset/contaminated-land
[67] Natural England (2019) Natural England's role in meeting climate change targets, https://naturalengland.blog.gov.uk/2019/06/21/natural-englands-role-in-meeting-climate-change-targets/ (Accessed 19 March 2021)



Legend

SEA Area Under Consideration

Agricultural Land Classification (Provisional)

- Grade 1 - Excellent
- Grade 2 - Very Good
- Grade 3 - Good to Moderate
- Grade 4 - Poor
- Grade 5 - Very Poor
- Non Agricultural
- Urban

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Project Title:
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Figure Title:
Agricultural Land Classification

Figure Number:	Date:
Figure B.4	April 2022

20 0 20 40 km

N

Note: All locations are approximate

B.5.2 Geology

Geological sites maybe sensitive to changes in water quality, water levels (for example waterlogged deposits), pollution and land use practices. Geological Conservation Review (GCR) sites have been highlighted, which relate to geological important sites, related to their scientific elements and understanding of earth sciences, which are important on a national and international level[68]. GCRS are also designated as SSSIs. Several geological SSSIs are found within the catchments, however some are not directly designated because of geology, although the geological variation does impact on the flora present. The main reason for a geological citation for an SSSI are related to disused quarries and geological important sites such as gravels used to reconstruct climate change. There are around 180 GCRs within the Anglian Water study area.

B.5.3 Future Baseline

The vision of Defra's Soils Strategy for England[69] 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.

The Water White Paper described the Government's intentions to take forward a catchment-based approach to water quality and diffuse pollution and work towards Common Agricultural Policy reforms that will promote the farming industry's role as custodian of the natural environment[70]. The Water White Paper also identified that the strategic policy statement for Ofwat and revised social and environmental guidance would give a strong steer on Government support for approaches that offer good value for customers and the potential to prevent and manage future risks to drinking water quality. These policy objectives were reflected in regulatory guidance from Government for the 2014 water resources management planning process and the 2014 water company price review process. The catchment-based approach has now been implemented across England, with catchment partnerships now in place to take forward the approach over the coming years. The catchment-based approach is further emphasised in the national framework for water resources as a 'must have' component of the Regional Plans due to published in 2023.

One of the core planning principles of the National Policy Planning Framework (NPPF) 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 with respect to Green Belt policy, the aim of which is to prevent urban sprawl by keeping land permanently open. 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. Although the NPPF promotes a presumption in favour of sustainable development, this does not apply where proposed developments may affect European or other designated sites covered by specific policies.

[68] http://jncc.defra.gov.uk/page-2947
[69] Defra (2009), Safeguarding our soils – A Strategy for England
[70] Defra (2011) Water for Life - Water White Paper

B.6 Air and Climate

B.6.1 Climatic Factors

B.6.1.1 Current Trends in the UK

The Central England Temperature dataset is the longest running instrumental record of temperature in the world. Data from this shows that the most recent decade (2009-2018) was approximately 1°C warmer than the pre-industrial period (1850-1900), which is consistent with global temperature observations. The 21st century so far, has been warmer than the previous three centuries and in the series from 1884, the top ten warmest years for the UK have occurred since 2002[71].

Over the past decade (2010-2019), UK summers have been on average 11% wetter than the period 1981-2010 and UK winters have been 4% wetter than 1981-2010 and 12% wetter than 1961-1990[72]. Rainfall patters across the UK are not uniform and vary on seasonal and regional scales. Much of eastern England receives less than 700 mm of rainfall per year and includes some of the driest areas in the country.

B.6.1.2 Projected changes

The UK Climate Projections (UKCP) were updated for the first time since 2009 in December 2018 (UKCP18). The UKCP18 are largely the same as the previous projections where all areas of the UK are projected to be warmer, particularly during summer months. Rainfall is projected to vary seasonally and at a regional scale, however the UK is projected to have wetter winters and drier summers.

The projected changes in temperature and precipitation for the Anglian River Basin by the 2050s (2040-2069), under the RCP8.5 scenario are detailed in **Table B.21**. The 1981-2010 baseline period and the central estimate, representing 'as likely as not' probability of change (50th percentile), was used for the following projections.

Table B.21 Anglian River Basin UKCP18

Climatic Condition	Climate Projections
Temperature	Annual mean temperatures are projected to increase by 2.4°C. Summer temperatures are projected to see a 3.0°C increase whereas winter temperatures are project to increase by 2.1°C.
Precipitation	Annual mean precipitation rates are projected to increase by 2.8%. Precipitation is projected to increase by 11.7% in winter and decrease by 24.8% during summer.

Source: UKCP18 using the central probability estimate for a RCP8.5 scenario

B.6.1.3 Anglian Water's performance

[71] Met Office (2018) UK Climate Projections: Headline Findings. September 2019. Version 2.
[72] Kendon, M. et al. (2020) State of the UK Climate 2019.International Journey of Climatology, Volume 40, Issue S1. July 2020

In 2020 Anglian Water exceeded their carbon reduction targets. Annual gross operational carbon emissions reduced by 34% in 2019/20 in comparison to the 2014/15 baseline, reducing from 455,335 t/CO_2e to 298,576 t/CO_2e. There was also a 61% reduction in capital carbon against a 2010 baseline. Anglian Water are on track to achieve their target of net zero by 2030[73]. Anglian Water continue to improve energy efficiency and in delivered 84 energy saving projects in 2019/20, reducing carbon emissions by 2,320 tCO_2e. 131.1GWh of renewable electricity was generated across all Anglian Water assets in 2019/20, an increase of 30% compared with the end of AMP5.

B.6.2 Air

Air quality in the region is generally good, although there are over 70 declared Air Quality Management Areas (AQMAs). Motor vehicles, particularly on heavily trafficked roads, are the main source of air emissions. However, agriculture also contributes to the local air quality, as a result of housed livestock and the spreading of slurries and manures. Trends in annual average emissions of nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and particulate matter (PM_{10}) show the East of England is on track to meet the UK Air Quality Strategy Targets.

B.6.3 Future Baseline

Government and international targets indicate significant cuts in greenhouse gas emissions will take place by 2027. The UK met the first and second of its legislated carbon budgets (2008-2017) with headroom of 36 and 384 MtCO_2e, respectively and is projected to meet the third carbon budget (until 2022) with headroom of 88 MtCO_2e[74]. However, there are projected shortfalls against the fourth and fifth carbon budgets. In 2019, the UK set a new target to reduce greenhouse gas emissions by at least 100% (compared to 1990 levels) by 2050[75], an update from the previous target of an 80% reduction as set out in the Climate Change Act 2008. To achieve this ambition, emissions from buildings must reduce to almost zero and industrial processes will need to adapt, both significant to Anglian Water's operations.

The UK is currently meeting all statutory air quality limits, except for NO_2[76], where roadside NO_2 concentrations in particular have been identified as being above legal limits. In response, the government has created an air quality plan for NO_2[77], setting out how it aims to meet the ambitious and legally-binding targets set out for NOx and four other damaging air pollutants in the wider clean air strategy[78]. This strategy concludes that with the commitments and policies set out in the clean air strategy, the UK should meet all emissions ceilings in 2020 and 2030.

Climate change is a key theme with regards to biodiversity[79], climate change is likely to have an impact on biodiversity in the future by exacerbating pressures such as changes to the timing of seasonal activity and water scarcity. The 2018 UK Climate Projections (UKCP18) estimate that summers in the Anglian

[73] Anglian Water (2020) Anglian Water Services Limited Annual Integrated Report 2020
[74] Department for Business, Energy & Industrial Strategy (2019) Updated energy and emissions projections 2018. Accessed at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794590/updated-energy-and-emissions-projections-2018.pdf
[75] The Climate Change Act 2008 (2050 Target Amendment) Order 2019
[76] Nitrogen Dioxide
[77] Defra and DfT (2017) Air quality plan for nitrogen dioxide (NO2) in UK (2017)
[78] Defra (2019) Clean Air Strategy 2019
[79] Natural Environment White Paper The Natural Choice: Securing the Value of Nature (2011); DEFRA Biodiversity 2020: A strategy of wildlife and ecosystem services (2011).

River Basin area are likely, on average, to be hotter and drier which could affect the frequency and severity of drought events.

B.7 Archaeology and Cultural Heritage

B.7.1 Historic Environment Baseline

Implementation of drought options 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.

Nationally important archaeological sites are statutorily protected as Scheduled Monuments (SMs)[80]. There are currently around 19,861 entries in the Schedule for the UK[81]. There are approximately 1,936 SMs located within the SEA study area. Registered Parks and Gardens also make up part of the UK's heritage assets (1,695 in 2018-19 in England). There are approximately 197 sites designated as such in the SEA study area. Counts of all heritage assets in the Anglian Water SEA study area is provided in **Table B.22**.

Table B.22 Heritage counts in Anglian SEA Study Area (2020[82])

	SEA Study Area	England
World Heritage Site	0	19
Scheduled Monuments	1,936	19,861
Listed Buildings	50,307 *Grade I 1,938* *Grade II* 3,169* *Grade II 45,200*	378,526
Registered Historic Parks and Gardens	197 *Grade I 17* *Grade II* 51* *Grade III 129*	1,695
Registered Historic Battlefields	4	47
Protected Historic Wrecks	0	54

Conservation Areas are usually designated by the local planning authority and are designated for their special architectural and historic interest. Conservation Areas can include historic town and city centres, fishing and mining villages, 18th and 19th century suburbs, model housing estates, country houses set in historic parks and/or historic transport links and their environment. There are over 8,000 conservation areas in England. Individual local authorities provide details on specific conservation areas.

Historic England collects data on buildings at risk. There are currently 5,097 designated assets on the Heritage at Risk (HAR) register, including; 391 sites in the East of England and 447 sites in the East Midlands. In 2020, 181 entries were removed from the Register for positive reasons, but 216 were added.

[80] Nationally important archaeological sites designated under the Ancient Monuments and Archaeological Areas Act, 1979, www.culture.gov.uk/historic_environment/scheduled_ancient_monuments/
[81] Historic England (2019) Heritage Indicators 2019
[82] Historic England (2020) Listing data from National Heritage List for England (NHLE). https://historicengland.org.uk/listing/the-list/data-downloads/ *Accessed 14 December 2020*.

Historic Environment Record (HER) databases linked to a Geographic Information System (GIS) are held by County Councils, District Councils or Unitary Authorities. They represent unique repositories of, and signposts to, information relating to landscapes, buildings, sites and artefacts spanning from the Palaeolithic period to modern times. Presenting this wealth of information for the Anglian Water SEA study area would be difficult, however, it can be interrogated where the Drought Plan options have the potential to affect such assets.

In 2020, 114 archaeological sites were classed as currently at risk in the East of England[83] and a further 231 sites in the Midlands[84], however only a small proportion of these fall into the SEA study area. There are no designated areas of archaeological importance located within Anglian Water's region. Local Authorities have records of regional or local important archaeology which would be too much information to list here. Buried archaeology is particularly vulnerable to changes in water levels and therefore areas which have known, or potential, buried archaeology will need to be carefully managed and specialist advice sought on the most appropriate action to pursue. Unknown heritage assets are difficult to scope, however, there is an awareness that these will exist within the study are and have the potential to be impacted.

B.7.2 Future Baseline

The NPPF was introduced in 2012 to replace the Planning Policy Statements. The NPPF aimed to make the planning system less complex and more accessible, and changed the emphasis on planning to have a presumption in favour of development. However, core planning principles include those aiming to protect heritage assets, including "*conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations*"[85]. The NPPF was revised in 2019 but the policy on historic environment was broadly unchanged.

Recent and ongoing national economic difficulties may have a negative effect on removing heritage assets from the heritage at risk register. 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. However, many more historic assets are potentially at risk from the direct impacts of future climate change[86].

[83] Historic England (2020) Heritage at Risk, East of England Register 2020
[84] Historic England (2020) Heritage at Risk, Midlands Register 2020
[85] CLG (2012) National Planning Policy Framework, Communities and Local Government. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf
[86] English Heritage (2010) Climate Change and the Historic Environment

B.8 Landscape and Visual Amenity

B.8.1 Baseline

There are five areas of outstanding natural beauty, including The Chilterns, Dedham Vale, Lincolnshire Wolds, Norfolk Coast, and Suffolk Coast and Heaths. In addition, it is the arable agricultural core of England and this aspect dominates the rural landscape. The Anglian region has a diverse and contrasting landscape, including extensive flat, open spaces of intensive arable farming as well as the vast coastal areas, including Norfolk, Suffolk and Essex.

National Character Areas (NCAs) are distinctive landscapes which make up the countryside character. The following NCAs are relevant for the Drought Plan 2022:

- 39 Humberhead Levels (NE339) – a flat, low-lying and large scale agricultural landscape bounded to the west by the low ridge of the Southern Magnesian Limestone and to the east by the Yorkshire Wolds (north of the Humber) and the Northern Lincolnshire Edge with Coversands (south of the Humber). To the north it merges into the slightly undulating landscape of the Vale of York, at the line of the Escrick Moraine, and in the south it merges in to the Trent and Belvoir Vales and Sherwood.
- 46: The Fens (NE424) – a large, low-lying, flat landscape with many drainage ditches, dykes and rivers that slowly drain towards The Wash. Notable for its extensive vistas, the level, open topography shapes the impression of huge skies which convey a strong sense of place, tranquillity and inspiration.
- 48: Trent and Belvoir Vales (NE429) - characterised by undulating, strongly rural and predominantly arable farmland, centered on the River Trent. A low-lying rural landscape with relatively little woodland cover, the NCA offers long, open views.
- 76 North West Norfolk (NE520) – characterised by a very open, rolling topography which contrasts with the surrounding coastal, fenland and other lowland NCAs. Large-scale arable and grassland landscape, important for agriculture. Aquifers underlying the NCA and extending well beyond its boundaries provide water both locally and regionally.
- 78 Central North Norfolk (NE526) - this is ancient countryside with a long-settled agricultural character, where arable land is enclosed by winding lanes and hedgerows, interspersed with woodland and remnant heath and dissected by lush pastoral river valleys. A patchwork of cultivated land, numerous church spires, distant wooded horizons and big skies dominates the landscape.
- 81 Greater Thames Estuary (NE473) - predominantly a remote and tranquil landscape of shallow creeks, drowned estuaries, low-lying islands, mudflats and broad tracts of tidal salt marsh and reclaimed grazing marsh that lies between the North Sea and the rising ground inland. Sea defences protect large areas of reclaimed grazing marsh and its associated ancient fleet and ditch systems, and productive arable farmland. Historic military landmarks are characteristic features of the coastal landscape.
- 84 Mid Norfolk (NE523) – occupying the northern section of the East Anglian Plain, this broadly flat, rural landscape features ancient countryside with a long-settled agricultural character, where arable land is enclosed by winding lanes and hedgerows, interspersed with woodland and heath and dissected by lush pastoral river valleys. A patchwork of cultivated land, numerous church spires, distant wooded horizons and big skies dominate the landscape.

- 85 The Brecks (NE385) - also known as Breckland, lies at the heart of East Anglia, occupying much of south-western Norfolk and north-western Suffolk, together with a small part of north-eastern Cambridgeshire. The area has an ages-old identity, a very particular land use history and a richly distinctive wildlife, which sets it apart from all surrounding landscapes.
- 86 South Suffolk and North Essex Claylands (NE515) - it is an ancient landscape of wooded arable countryside with a distinct sense of enclosure. The overall character is of a gently undulating, chalky boulder clay plateau, the undulations being caused by the numerous small-scale river valleys that dissect the plateau. There is a complex network of old species rich hedgerows, ancient woods and parklands, meadows with streams and rivers that flow eastwards.
- 88 Bedfordshire and Cambridgeshire Claylands (NE555) - is a broad, gently undulating, lowland plateau dissected by shallow river valleys that gradually widen as they approach The Fens NCA in the east.
- 89 Northamptonshire Vales (NE527) - consists of a series of low-lying clay vales and river valleys, including the valleys of the rivers Nene and Welland and their tributaries. The area is 10 per cent urban, and settlement is often visually dominant.
- 91 Yardley-Whittlewood Ridge (NE501) - a low and gently undulating limestone plateau, commonly referred to locally as the Ridge, containing a variety of semi-natural habitats, including ancient woodland, wood pasture and parkland, hedgerows, lowland meadow and flood plain grazing marsh. The Ridge retains a high proportion of ancient woodland of national importance designated as Sites of Special Scientific Interest and supports a wide range of species, particularly scarce species of butterfly such as the white admiral and wood white.
- 92 Rockingham Forest (NE538) - is essentially a broad, low, undulating ridge underlain by Jurassic limestone which falls away from a prominent, steep northern scarp overlooking the Welland Valley. Large areas of woodland remain a significant feature of the landscape and, while not forming continuous belts, the blocks of woodland often coalesce visually with hedgerow trees and smaller copses to increase the perception of extensive woodland cover across the landscape.
- 111 Northern Thames Basin (NE466) - is an area rich in geodiversity, archaeology and history and diverse landscapes ranging from the wooded Hertfordshire plateaux and river valleys, to the open landscape and predominantly arable area of the Essex heathlands, with areas of urbanisation mixed in throughout.

It is recognised that some of these landscapes are also important cultural landscapes with a strong heritage aspect. Such landscapes may also contain deposits and sediments (such as peat) which may have significant paleoenvironmental potential.

B.8.2 Future Baseline

It is envisaged that landscape and designated sites will be maintained and enhanced for the enjoyment of the public (although not through the DP itself), although with the pressures for housing in many parts of the Anglian SEA study 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 (e.g. 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. Historic England encourage seeking opportunities to promote public engagement with cultural heritage and historic landscapes,

perhaps in particular with regard to wetlands and past human use of water resources, to enhance public access and enjoyment.

B.9 Inter-relationships

It is noted that there are inter-relationships between SEA topics, for example, the potential impacts of changes to flow regime and water quality on ecology. Inter-relationships that result in changes to individual effect are considered through the assessment of synergistic effects.

Appendix C

Statutory Consultee Responses to SEA Scoping Report

C Statutory Consultee Responses to the Scoping Report

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
1	Natural England	1.2.4.2 para 2	"AW may require recourse to Drought Permits…." Should this say drought Order rather than permit? Otherwise implies SEA is only for some DPs and some will be determined at unspecified time later so is confusing	Amended to Drought Order
2	Natural England	2.4.3	DWC national average shouldn't be seen as a benchmark (values would be helpful) – sustainable PCC/DWC should be developed for normal and drought times.	See Future Baseline B.3.3 for values.
3	Natural England	2.4.6	Does resilience include not preventing adaptation or moving in response to climate, and recognise some spp/habitats may have nowhere left to go (head waters, spring lines etc)	Yes, assumed so.
4	Natural England	2.5 table 2.1 Biodiversity	14 SPA (not SAC). 5km radius may not be sufficient to capture all impacts. Especially aquifer/catchment impacts	Noted Section B.1.1 further outlines that all sites within 5km were automatically included in addition to any sites beyond this which may be affected by changes to surface or groundwater.
5	Natural England	2.5 table 2.1 material asset	"green" economy – what does this mean? Too open to interpretation, more specific	Will be considered for future iterations
6	Natural England	2.5 table 2.1 water	"ecology" check definition of what is meant here.	Will be considered for future iterations
7	Natural England	2.5 table 2.1 soil	Specific reference needed to peat soils and loss of carbon and role in climate change laso = also	Text added to B.5.1 and Section 3.4.5

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
8	Natural England	2.5 table 2.1 air and climate	See peat and carbon as above	Text added to B.5.1 and Section 3.4.5
9	Natural England	3.1 2nd bullet list	Baseline environment – clear recognition of off-site implications for Protected Sites and priority habitats	Noted
10	Natural England	Table 3.1 Biodiversity objectives 1.1	Protect where “feasible” what does this mean? Technically, financially, logistically?	The nature of drought options may not have the ability to enhance biodiversity.
11	Natural England	Table 3.1 Biodiversity objectives 1.1	“contribute to the economy” what does this mean, and does it exclude biodiversity without a clearly defined contribution to the economy? Value of biodiversity to lives and hence economy is increasingly well evidenced	Noted, contribute to the economy reference removed to avoid confusion
12	Natural England	Table 3.1 Biodiversity objectives 1.2	Specific reference to eels needed– globally and regionally significant as part of biodiversity and culturally	Freshwater fisheries encompass a range of species including globally and regionally significant species.
13	Natural England	Table 3.1 Biodiversity interrelationships	Confirm: water-dependent habitats includes wetlands, marshes, ditches etc as well as rivers and lakes	Yes, any habitat that is dependent on water.
14	Natural England	Table 3.1 Population 2.3	There is a potential interrelationship between enhanced recreation/access and disturbance to ecosystems that needs to be recognised. Eg, but not exclusively, nesting birds	Noted, this has been added to Table 4.1 in the Environmental Report
15	Natural England	Table 3.1 Water 4.3	There is a potential interrelationship between saline intrusion and soil quality (5.1) as well as biodiversity	Noted, this has been added to Table 4.1 in the Environmental Report
16	Natural England	Table 3.1 Soil 5.1	Clarity over what previously developed or derelict land means. Such sites can be of significant biodiversity value (eg early succession, scrub and invertebrates) so a site specific approach rather than a catch-all presumption for their use would be better	Noted, this has been added to Table 4.1 in the Environmental Report
17	Natural England	Table 3.1 Soil 5.1	Potential land use implications for continued delivery of agri-environment schemes has environmental and socio-economic consequences	Noted, this has been added to Table 4.1 in the Environmental Report
18	Natural England	Table 3.1 Air and climate 6.1	reducing carbon emissions that come from reduced wetness of peat habitats and soils should be explicit	Reference to this added to soils section and Table 4.1 in Environmental Report

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
19	Natural England	3.2.1	Clarity over use of “best practice” does this carry through unchanged to delivery of measures or will there be other influences on final practice? See comment 3.1 1.1	Will be considered for future iterations
20	Natural England	3.2.1	Need to have due regard to the timing of short term impacts, depending on the season short term impacts can have long term implications	Noted, this has been considered during the assessment.
21	Natural England	3.2.1 p40	What does “standard best practice mean”? technologically available best practice or another measure? Needs clarifying	Will be considered for future iterations
22	Natural England	Table 3.2 column 3	How does use of “good practice” construction methods relate to best practice referred to earlier, consistency. Use of best, standard best and good practices – consistency or clarity on these terms if different needed	Will be considered for future iterations
23	Natural England	Table 3.3 Medium	This category, presuming it is to cover anything explicitly not in High covers a very large range of impacts, so of which would be very serious harm to sites, habitats and their ecology and so not be acceptable and others that would be less so. So it is unclear how Medium will be addressed in terms of actions and priorities, and more clarity on the connection between categorisation and subsequent action is needed Integrity – is this used in a Habs Regs sense? Any partial loss is likely to be an adverse effect on integrity so feel the current definition encompasses effects that would be viewed as high.	See Methodology document
24	Natural England	Table 3.3 High and Medium	The inherent uncertainties in droughts and ecological response to effects means effects that may not be definitive but serious enough if they were to happen need still to be considered high or medium	Noted
25	Natural England	3.2.3 cumulative effects	The principle is very important and needs to be adopted at the significance matrix level (table 3.4) as well as the cumulative effect of other plans and projects as described. Determine cumulative effects of L, M & H effects from all pathways on a receptor due to the interactions between factors. Eg reduced flow can lead to increased nutrient concs that together will have a greater effect than reduced flow alone or the sum of individual effects.	The SEA is a high-level assessment of the Drought Plan, encompassing a basket of measures. More detailed assessment is provided in the individual EARs.

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
26	Natural England	Page 42 Slight	Cumulative effects on a receptor of slight effects may be significant and so decision-making issues. See also above	The SEA is a high-level assessment of the Drought Plan, encompassing a basket of measures. More detailed assessment is provided in the individual EARs.
27	Natural England	Appendix A Table A1 National	Add: Government 25 Year Environment Plan Natural England "Building Partnerships for Nature's Recovery" and Action Plan NERR064 A narrative for conserving freshwater and wetland habitats in England NERR071 Generating more integrated biodiversity objectives – rationale, principles and practice Conservation Objectives Supplementary Advice packages for N2K sites Defining Favourable Conservation Status packages Climate Change Adaptation Manual (NE751) Greater Norwich Water Cycle Study	25 Year Environment Plan already included and rest have been reviewed and added.
28	Natural England	Appendix B	Further review of sites potentially affected out with a 5km radius. Eg B.2 Sweet Briar Meadows SSSI CWS should be included as these form part of habitat networks contributing to FCS of N2K features. Depending on the measures in the DP consideration of all water dependent PS d/s of the Wensum along the River Yare may be necessary. This wider view of impact pathways will be critical for scoping and in combination effects for associated HRA	The SEA is a high-level assessment of the Drought Plan, encompassing a basket of measures. The baseline review is used to form the framework for assessment and therefore this level of detail is not usually required and will not change the objectives overall. More detailed assessment on sites is provided in the individual EARs.
29	Historic England	2.1 Environmental Baseline Review	Table 2.1 is welcomed. Within the Archaeology and Cultural Heritage section, it would be helpful to reference 'historical and cultural assets' as	Reference to heritage assets been made in B.7 and 3.4.7. Reference to unknown heritage

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
			'heritage assets' to more closely reflect NPPF wording, similar to the fifth bullet point. The words 'and their setting' should be included after 'heritage assets' in the fifth bullet point. Heritage assets should encompass both designated and non-designated heritage assets. Unknown heritage assets should also be referenced within this section. Whilst difficult to scope there should be an awareness that, given the large geographical area covered by the scoping, these will exist and will potentially be impacted. Battlefields should also be referenced in the first paragraph of page 27 within Table 2.1.	assets made in B.7. Battlefields have been considered in the baseline.
30	Historic England	Table 3.1 Archaeology and cultural heritage	Within the first bullet point, reference to 'designated and non-designated heritage assets and their settings' should be included with 'battlefields' listed after the e.g., in the first sentence, together again with the potential for unknown assets	This table is not included in the Environmental Report, however, battlefields have been considered in the baseline (B.7.1).
31	Historic England	Appendix A	Appendix A is welcomed. Please also add the following Plans and Programmes into the table: National National Planning Practice Guidance P 67 Please note that our SES guidance was updated in 2016 (see link at the start of the letter). Please update this reference Local Local Plans Historic Environment Record Heritage/Conservation Strategies Other Strategies (e.g. cultural or tourism) Conservation Area Character Appraisals and Management Plans	References to those plans and programmes of relevance have been added to Appendix A

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
			Listed building Heritage Partnership Agreements	
32	Historic England	Appendix B	Historic England welcome the recognition of the existence of water dependent heritage and its sensitivity to changes in the water environment as expressed in the opening paragraph of B.7.1 (p. 114) Reference to Battefields within Table B.22 is welcomed As described above, there is concern that the potential for unknown heritage assets is not referenced. Whilst obviously difficult to scope in there needs to be an awareness that these will exist and will potentially be impacted. Again it would also be helpful to clarify the need to consider both designated and non-designated heritage assets and their settings.	Text added to B.7.1
33	Historic England	Page 115	The first two sentences on the first paragraph of page 115 require clarification. These read as follows: *"In 2019, 159 archaeological sites were classed as currently at risk in the East of England. There are no designated areas of archaeological importance located within Anglian Water's Region…"* The number of archaeological sites at risk in the Anglian Water areas of the Midlands (and if none, then this should be stated) should be included. With reference to the second sentence, an area of archaeological importance Alongside the list of databases of heritage assets it would be useful to ensure that relevant strategy documents are consulted, such as Historic England's '*Strategy for Water and Wetland Heritage'* (2012), available at the following link: https://historicengland.org.uk/research/agenda/thematic-strategies/water-wetland/ There are also resources of information that *may* potentially be of relevance such as Historic England's '*Intertidal and Coastal Peat Database*', available at: https://historicengland.org.uk/research/current/heritage-science/intertidal-peat-database/	Reference made to Midlands, however, no GIS dataset was available to download so unable to count accurately.
34	Historic England	Section B.8	Landscape and Visual Amenity	These landscapes are mentioned below under NCAs. Text added to Section B.8

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
			In the Midlands this includes landscapes such as the Humberhead Levels and the Trent and Belvoir Vales. The opportunity should be taken to ensure that a holistic approach is taken to understanding the effects of the Drought plan with regards to these landscapes. That is to say, there needs to be a recognition that landscapes (like the two mentioned above) are also cultural landscapes with strong heritage aspect, and that the scoping needs to ensure this is recognised. This is particularly important because such landscapes contain deposits and sediments (such as peat) that may have significant paleoenvironmental potential. Whilst not a specific site or monument themselves they are an important source of information on human activity in the past and contribute to our understanding of landscape and the setting of archaeological sites and monuments within it. As they are highly susceptible to being negatively impacted by changes in the water environment it is important that they should be scoped in. As part of a holistic approach, we would encourage seeking opportunities to promote public engagement with cultural heritage and historic landscapes, perhaps in particular with regard to wetlands and past human use of water resources, to enhance public access and enjoyment.	
35	Historic England	Mapping	Mapping heritage assets would provide a greater indication of their distribution and highlights sensitive areas. Please include mapping in this section, as for other topic areas.	The SEA is a high-level assessment of the Drought Plan, encompassing a basket of measures. The baseline review is used to form the framework for assessment and therefore this level of detail is not usually required and will not change the objectives overall.
36	Historic England	Sustainability Indicators	We suggest that you also include Sustainability Indicators in the Assessment. Our advice note Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment (2016) provides advice	Will be considered for future iterations

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
			on indicators and data sources in Paragraphs 2.13 – 2.17 of our advice note (see links above).	
37	Historic England	Method for Generation of Alternatives	The historic environment should be a factor when considering a method for the generation of alternative proposals. The impact of proposals on the significance of heritage assets should be taken into consideration at an early stage.	Noted
38	Historic England	Avoiding Harm to the Historic Environment	We would also remind you that the NPPF (para 32) is very clear that in terms of sustainable development harm to the historic environment should be avoided and wherever possible alternative options which reduce or eliminate such impacts should be pursued. *NPPF Para 32: Local plans and spatial development strategies should be informed throughout their preparation by a sustainability appraisal that meets the relevant legal requirements. This should demonstrate how the plan has addressed relevant economic, social and environmental objectives (including opportunities for net gains). Significant adverse impacts on these objectives should be avoided and, wherever* *possible, alternative options which reduce or eliminate such impacts should be pursued. Where significant adverse impacts are unavoidable, suitable mitigation* *measures should be proposed (or, where this is not possible, compensatory measures should be considered).*	Noted
39	Historic England	Assessment process	In the assessment of alternative sites, it is important that due weight is given to the potential harm to the historic environment. We would advise against a purely distance based approach. The impact of proposals on the significance of heritage assets should be taken into consideration at an early stage. In terms of sites, this should be based on	This level of detailed assessment is not required for the Strategic Environmental Assessment of a Drought Plan (DP) as the plan contains a basket of measures that may or may not be implemented during the DP period. The DP options do not contain any

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
			more than just measuring the proximity of a potential allocation to heritage assets. Impacts on significance are not just based on distance or visual impacts, and assessment requires a careful judgment based on site visits and the available evidence base. The application of a standard proximity test (e.g. is the site within a set distance of a heritage asset) should not be used as it can lead to misleading results. A simple matrices approach is not considered sufficient. We would want to see a narrative-based approach that properly considers more nuanced issues in relation to setting and significance of both designated and non-designated heritage assets.	construction related impacts however the impacts related to water dependent assets have been considered. Commentary is included in the framework table to justify assessments.
40	Historic England	Conservation Teams/Archaeological Advisors	We would also encourage you to work with local conservation officers, archaeology officers and local heritage community groups in the preparation of the SEA. They are best placed to advise on; local historic environment issues and priorities, including access to data held in the HER (formerly SMR); how the policy or proposal can be tailored to minimise potential adverse impacts on the historic environment; the nature and design of any required mitigation measures; and opportunities for securing wider benefits for the future conservation and management of heritage assets.	Noted, see point above.
41	Environment Agency	General	This was a good document clearly setting out the context and options. The methodology section was clear and transparent on how the options would be assessed and significance assigned and the report covers all aspects required by the Regulations. Not significant, but consideration could be given to the layout as logistically comparing the baseline in appendix B and table 2.5 to check the review was a bit tricky.	The appendices were put into a separate report to make side by side review easier. They have been incorporated together with the main report for the final version, so everything is contained together
42	Environment Agency	1.2.4.3 Generic Options	Extreme Comms – explanation could be improved, detailing what this really means.	Detail added into report

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
			Targeted Leakage Reduction – Unsure why is this included here? Would have thought that this would be covered under water resource management plans. If dealt with effectively under WRMP is this really a significant option for Drought Plans? If so why?	
43	Environment Agency	2.4.3, 2.4.6 & 2.5	No mention of carbon emissions or reduction targets. As with the previous Drought Plan SEA Scoping doc's this may be implied under headings such as energy efficiency. What targets have Anglian Water set themselves and why are these not better reflected in the objectives and indicator questions under 2.5?"	Text added to B.6.1 about AWS current targets for carbon emissions. These have been taken into account when assessing against SEA framework.
44	Environment Agency	Wellington Wellfield	List of SSSI's seems quite comprehensive. There are however many local and county wildlife sites that are not included. Depending on the zone of influence these should include: Lakenheath Fen, String Drain, Cut off Channel (COC) Feltwell, COC Methwold Hyde, COC Northwold, Abbey Meadows, Gashorse Drove meadows, River Wissey, Langford Pastures, Watermill Broad (Cranwich Pits), Fosse ditch. I would suggest that the local/county wildlife search needs re-visiting as I may not have captured all relevant sites.	The SEA is a high-level assessment of the Drought Plan. More detailed assessment on sites is provided in the individual EARs.
45	Environment Agency	Offord intake	There are 2 water dependant SSSI's fairly close upstream of the Offord Intake that should also be included Little Paxton Pits and St Neots Common. There are multiple local nature reserves that could be impacted by a reduction in river levels but are not included, I feel this area should be re-visited. Along the Ouse Valley there are a series of floodplain meadow and gravel pits sites which are local wildlife sites including Little Paxton Pits, Buckden Gravel Pits, Brampton Flood Meadow, West Meadow, Cow Lane Gravel Pits, Hemingford Meadow, Hemingford Grey Gravel pits, Hemingford Grey Meadow, Meadow Lane Gravel Pits, Middle Fen, Holt Island, River Great Ouse and Fen Drayton Gravel pits.	The SEA is a high-level assessment of the Drought Plan. More detailed assessment on sites is provided in the individual EARs. As above

No.	Consultee	Scoping Report / Ref	Comment	How addressed in Environmental Report
46	Environment Agency	Page 88 section B.1.3	Its stated that the implementation of the drought options is not likely to increase the risk of INNS (page 88 section B.1.3). It needs to be clear that this statement is for current preferred options only and not some of the wider options which are included in the text of this scope in earlier sections of the document. There would still need to be an assessment made of the INNS regardless of this over-arching statement.	Text added to B.1.3 to make this distinction
47	Environment Agency	Page 21	the fact that WFD objectives are recognised is key, recognition of links between water and biodiversity is important. Navigation on the Nene? Maybe a need for stronger recognition of amenity value of River Nene and backwater channel interests? I'm looking for some recognition of water and silt/sedimentation in the Lower Nene area downstream of Wansford as far as Wisbech? Sediment transport has historically been of concern to the Port of Wisbech during previous droughts	Received after end of scoping consultation, will be considered for future iterations
48	Environment Agency	p. 31 & 32 Table 3.1	Reference to CAMS should be changed to 'Abstraction Licensing Strategies'. There is reference on page 32 to potential physical effects on channel and/or river hydromorphology – it would be helpful if this specifically highlighted silt/sedimentation and links with amenity/navigation etc as well as potential environmental impacts.	CAMS reference updated
49	Environment Agency	p. 87 In Table B.4	that whilst the intake for Pitsford is hydraulically linked to The Wash, it's 'impacts' are over-ruled by the regulated activities at Wansford i.e. only drought Permit at Wansford in theory can affect The Wash	Received after end of scoping consultation, will be considered for future iteration
50	Environment Agency	B.4.1	Reference to CAMS should be changed to 'Abstraction Licensing Strategies'	Updated
51	Environment Agency	Page 6	Figure 1.2 colours for dots for Rutland & Pitsford are the wrong way round.	Figure amended

D Assessment Tables

D.1 Drought Plan Action: Customer Metering

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/ High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	The household meters would be a permanent fixture and as such could act to reduce demand (and therefore the amount of abstraction required) over the long term, which could have some slight positive secondary effects for biodiversity, flora and fauna.	Low	Low	Medium	High	Long-term	Permanent	No effect	Slight positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	The household meters would be a permanent fixture and as such could act to reduce demand (and therefore the amount of abstraction required) over the long term, which could have some slight positive secondary effects for biodiversity, flora and fauna.	Low	Low	Medium	High	Long-term	Permanent	No effect	Slight positive
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	No impacts on INNS have been identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	Reduced demand for water could help to avoid the need for more restrictive measures such as temporary use bans during the drought – however this would entirely depend on the severity of the drought itself, so the impact is uncertain. There may be some temporary and localised increases in traffic associated with meter installation works, but it is anticipated that this could be managed through good practice and is unlikely to be strategically significant.	Medium	Low	Medium	Low	Short-term	Temporary	Negligible negative	Slight positive
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	Reduced demand for water could help to avoid the need for more restrictive measures such as temporary use bans during the drought. However, this would entirely depend on the severity of the drought, so the impact is uncertain.	Medium	Low	Medium	Low	Short-term	Temporary	No effect	Slight positive
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	No impacts identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	Customer metering will reduce the demand for water in the region, improving the efficiency of existing resource use. It will not result in any increase in the generation of waste.	Low	Medium	Medium	Medium	Long-term	Permanent	No effect	Slight positive
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	Customer metering will reduce the demand for water in the region, improving the efficiency of existing resource use.	Low	Medium	Medium	Medium	Long-term	Permanent	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	The household meters would be a permanent fixture and as such could act to reduce demand (and therefore the amount of abstraction required) over the long term, which could have some slight positive secondary effects for river flows and groundwater resources.	Low	Medium	Medium	Medium	Long-term	Permanent	No effect	Slight positive
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	The household meters would be a permanent fixture and as such could act to reduce demand (and therefore the amount of abstraction required) over the long term, which could have some slight positive secondary effects for surface water quality.	Low	Medium	Medium	Medium	Long-term	Permanent	No effect	Slight positive

SEA topics and objectives		Assessment of option								
Water	4.3 To protect and enhance groundwater quantity and quality	The household meters would be a permanent fixture and as such could act to reduce demand (and therefore the amount of abstraction required) over the long term, which could have some slight positive secondary effects for groundwater.	Low	Medium	Medium	Medium	Long-term	Permanent	No effect	Slight positive
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	The household meters would be a permanent fixture and would encourage consumers to become more efficient with their water use, thus have moderate positive effects on water efficiency.	Low	Low	Medium	High	Long-term	Permanent	No effect	Moderate positive
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	No impacts on geology, quality/quantity of soils or land use are anticipated as a result of customer metering.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	The household meters would be a permanent fixture and as such could act to reduce demand. This could have some slight positive secondary effects in terms of reducing the amount of energy required to treat and supply water. There may be additional vehicle emissions associated with the installation of the meters, however this is likely to be minimal.	Low	Medium	Small	Medium	Short-term	Temporary	Negligible negative	Slight positive
Air and climate	6.2 To maintain and improve air quality	There may be additional vehicle emissions associated with the installation of the meters, however this is likely to be minimal.	Low	Medium	Small	Low	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Demand management measures are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low	High	Small	High	Long-term	Permanent	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	Customer metering is considered to have no direct impact on the historic environment, heritage assets and their settings and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing the magnitude of any drought related archaeology and cultural heritage impacts.	Low	Low	Medium	Medium	Medium-term	Temporary	No effect	Negligible positive
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Customer Metering is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at source, potentially reducing the magnitude of any drought related landscape or visual impacts.	Low	Low	Medium	Medium	Medium-term	Temporary	No effect	Negligible positive

D.2 Drought Plan Action: Targeted Leakage Reduction

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/ High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	Construction activities associated with leakage detection and repair activities may result in disturbance to local habitats and species during the works. The majority of works are anticipated to be in an urban setting. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The reduction in water lost through leakage will result in reduced requirement for abstraction at source and therefore, potential for positive impacts on flow and sensitive habitats/species.	Low (negative) Low (positive)	Low (negative) Medium (positive)	Medium	High	Long-term	Permanent	Negligible negative	Slight positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	Construction activities associated with leakage detection and repair activities may result in disturbance to local habitats and species during the works. The majority of works are anticipated to be in an urban setting. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The reduction in water lost through leakage will result in reduced requirement for abstraction at source and therefore, potential for positive impacts on freshwater fisheries.	Low (negative) Low (positive)	Low (negative) Medium (positive)	Medium	High	Long-term	Permanent	Negligible negative	Slight positive
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Leakage detection and repair activities will not affect the spread of INNS.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	Leakage reduction will help to ensure levels of service are maintained through enabling provision of water that would have otherwise been lost to leakage. As there is an increased cost associated with an increased effort in finding and fixing leaks, the option could result in an increase in average customer bills, which could adversely affect those less able to pay water bills.	Medium	Low	Medium	Low	Short-term	Temporary	Negligible negative	Moderate positive
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	Option will contribute to the maintenance of supply reliability in drought conditions, ensuring a resilient supply for customers and economic activity.	Low (positive)	High (positive)	Medium (positive)	Low	Long-term (positive)	Permanent (positive)	No effect	Moderate positive
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	Construction activities associated with leakage detection and repair activities may result in nuisance effects associated with traffic and noise. However, these will be short term at any one location (likely to be urban) and assuming best practice construction methods, effects will be minimal. It is assumed that public rights of way will be maintained during repair activities and there will be no effects on recreational opportunity.	Low (negative)	Low (negative)	Small (negative)	Low	Short-term (negative)	N/A	Negligible negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	Increased leakage reduction activity through 'fix and find' approaches will result in the reduction of water lost in the supply network and therefore the energy and chemicals used to treat it. It utilises existing infrastructure. Repairs may require raw materials. It has been assumed that any materials required would be obtained locally.	Low (negative) Low (positive)	Low (negative) Low (positive)	Small (negative) Small (positive)	High	Long-term	Permanent	Negligible negative	Negligible positive
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	No opportunities to promote the sustainable management of natural resources have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

SEA topics and objectives		Assessment of option								
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	Leakage reduction will not directly result in, or modify any abstraction (surface water or groundwater) and therefore will not effect surface water or groundwater levels. However, the reduction in water lost through leakage will result in reduced requirement for abstraction at source.	Low (positive)	Medium (positive)	Medium (positive)	Medium	Long-term	Permanent	No effect	Slight positive
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	Construction activities associated with leakage detection and repair activities may result in the potential for impacting on local surface and groundwater quality. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The reduction in water lost through leakage will result in reduced requirement for abstraction at source, and therefore also mitigate any surface water quality effects associated with abstraction.	Low (positive) Low (negative)	Low (positive) Low (negative)	Medium (positive) Small (negative)	Medium	Long-term (positive) Short-term (negative)	Permanent (positive) Temporary (negative)	Negligible negative	Negligible positive
Water	4.3 To protect and enhance groundwater quantity and quality	Construction activities associated with leakage detection and repair activities may result in the potential for impacting on local groundwater quality. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The reduction in water lost through leakage will result in reduced requirement for groundwater abstraction at source, and therefore also mitigate any groundwater quality effects associated with abstraction.	Low (positive) Low (negative)	Low (positive) Low (negative)	Medium (positive) Small (negative)	Medium	Long-term (positive) Short-term (negative)	Permanent (positive) Temporary (negative)	Negligible negative	Negligible positive
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	Construction activities associated with leakage reduction activity and 'fix and find' approaches may result in localised disturbance to geology and land use. However, repair activity will be on pipelines which are already in situ.	Low (negative)	Low (negative)	Small (negative)	High	Short-term	Temporary	Negligible negative	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	Vehicle trips necessary for leakage detection and repair will cause emissions of greenhouse gas emissions. Leakage detection and repairs will result in the reduction of water lost in the supply network and long term energy savings associated with this reduction (decreased greenhouse gas emissions associated with decreased need for water treatment and pumping).	Low (positive) Low (negative)	Medium (positive) Medium (negative)	Medium	Medium	Long-term (positive) Short-term (negative)	Permanent (positive) Temporary (negative)	Slight negative	Slight positive
Air and climate	6.2 To maintain and improve air quality	Vehicle trips necessary for leakage detection and repair will cause emissions affecting air quality, including some within Air Quality Management Areas in Anglian Water's supply area.	Low (negative)	High (negative)	Small (negative)	Low	Short-term	Temporary	Slight negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Demand management measures are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought which may become more prevalent due to climate change.	Low	High	Small	High	Long-term	Permanent	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	Increased leakage reduction activity through 'fix and find' approaches will be on pipelines which are already in situ, and as such, it is not anticipated that any sites of archaeological or cultural heritage importance will be affected. The setting of any surrounding heritage assets may be impacted for the short term, however, considering the option is an acceleration of ongoing leakage reduction activity this is considered negligible.	Low (negative)	Low (negative)	Small (negative)	Medium	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	The majority of works are anticipated to be in an urban setting. Assuming best practice construction methods, impacts of the construction phase are anticipated to be negligible. The scheme will have no direct effect on landscape and visual amenity in operation.	Low (negative)	Low (negative)	Small (negative)	Medium	Short-term	Temporary	Negligible negative	No effect

D.3 Drought Plan Action: Communication campaigns and messaging

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/ High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	The campaigns to raise public awareness can be carried out in a number of ways using a variety of different types of media. This measure will have no adverse impacts on biodiversity, flora or fauna, or designated sites of nature conservation interest. However the measure will reduce consumer demand for water and thereby reduce the requirement for abstraction from Anglian Water's sources, with the potential for positive impacts on flow sensitive habitats/species.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	The campaigns to raise public awareness can be carried out in a number of ways using a variety of different types of media. This measure will have no adverse impacts on fisheries. However the measure will reduce consumer demand for water and thereby reduce the requirement for abstraction from Anglian Water's sources, with the potential for positive impacts on flow sensitive fish species and their habitats	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.		N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	The media campaign will result in water savings which will contribute towards improving the security of supply for customers in Anglian Water's supply region. The media campaign will also help raise awareness of the importance and value of water environment for health and well-being.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	The media campaign will result in water savings which will contribute towards improving the security of water supply for businesses in the region, therefore protecting the local economy.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	No impacts on recreation, tourism or navigation are anticipated as a result of the media campaign.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	The communication campaign will not involve any increased material resource use. This measure will reduce the amount of water used in the region. It will not involve any increased waste production.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	No opportunities to promote the sustainable management of natural resources have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	The media campaign is considered to have a beneficial impact on the water environment, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction from water sources in the Anglian Water operating area..	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive

SEA topics and objectives		Assessment of option								
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	Reductions in demand for water due to this drought plan measure would result in reduced requirement for abstraction from Anglian Water's sources, reducing associated abstraction impacts on surface water quality in drought conditions.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	Reductions in demand for water due to this drought plan measure would result in reduced requirement for abstraction from Anglian Water's sources, reducing associated abstraction impacts on groundwater quality in drought conditions.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	The drought publicity are considered to have beneficial impact on water via reduced consumer demand for water. This may have long term impacts on consumer behaviours and water usage through information provision and providing information to the public regrading water efficiency methods.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.		Low (negative)	Low (negative)	Small (negative)	High	Short-term	Temporary	No effect	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	The media campaign will not involve an increase in energy consumption or associated greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.2 To maintain and improve air quality	No impacts on air quality are anticipated as a result of the media campaign.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Demand management measures are a key component of Anglian Water's Drought Plan. The Plan aims to ensure the resilience of water supplies to drought which may become more prevalent due to climate change.	Low (positive)	High (positive)	Small	High	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	The media campaign is considered to have no direct impact on the historic environment, heritage assets and their settings and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at Anglian Water's sources, potentially reducing any impacts of drought-related effects on archaeology and cultural heritage assets.	Low (positive)	Low (positive)	Medium	Medium	Short-term	Temporary	No effect	Negligible positive
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	The media campaign is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at Anglian Water's sources, potentially reducing any impacts of drought-related landscape or visual impacts.	Low (positive)	Low (positive)	Medium	Medium	Short-term	Temporary	No effect	Negligible positive

D.4 Drought Plan Action: Water efficiency activities

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/ High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	This measure will have no adverse impacts on biodiversity, flora or fauna, or designated sites of nature conservation interest. However the measure will reduce consumer demand for water and thereby reduce the requirement for abstraction from Anglian Water's sources, with the potential for positive impacts on flow sensitive habitats/species.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	This measure will have no adverse impacts on fisheries. However the measure will reduce consumer demand for water and thereby reduce the requirement for abstraction from Anglian Water's sources, with the potential for positive impacts on flow sensitive fish species and their habitats	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	No impacts on INNS identified.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	Water efficiency activities will result in water savings which will contribute towards improving the security of supply for customers in Anglian Water's supply region. The activities will also help raise awareness of the importance and value of water environment for health and well-being.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	Water efficiency activities will result in water savings which will contribute towards improving the security of water supply for businesses in the region, therefore protecting the local economy.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	No impacts on recreation, tourism or navigation are anticipated as a result of water efficiency activities.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	Water efficiency activities will result in direct water savings for both domestic and non-household customers.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	This option will directly encourage sustainable water management and raise awareness amongst customers.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	Water efficiency activities are considered to have a beneficial impact on the water environment, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction from water sources in the Anglian Water operating area..	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	Reductions in demand for water due to this drought plan measure would result in reduced requirement for abstraction from Anglian Water's sources, reducing associated abstraction impacts on surface water quality in drought conditions.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	Reductions in demand for water due to this drought plan measure would result in reduced requirement for abstraction from Anglian Water's sources, reducing associated abstraction impacts on groundwater quality in drought conditions.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive

SEA topics and objectives		Assessment of option								
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	Water efficiency activities are considered to have beneficial impact on water via reduced consumer demand for water. This may have long term impacts on consumer behaviours and water usage through information provision and providing information to the public regrading water efficiency methods.	Low (positive)	Medium (positive)	Medium	Medium	Long-term	Temporary - Permanent	No effect	Slight positive
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	No impacts on soil, geology or land-use have been identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	The media campaign will not involve an increase in energy consumption or associated greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.2 To maintain and improve air quality	No impacts on air quality are anticipated as a result of the media campaign.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Demand management measures are a key component of Anglian Water's Drought Plan. The Plan aims to ensure the resilience of water supplies to drought which may become more prevalent due to climate change.	Low (positive)	High (positive)	Small	High	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	Water efficiency activities are considered to have no direct impact on the historic environment, heritage assets and their settings and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at Anglian Water's sources, potentially reducing any impacts of drought-related effects on archaeology and cultural heritage assets.	Low (positive)	Low (positive)	Medium	Medium	Short-term	Temporary	No effect	Negligible positive
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Water efficiency activities are considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at Anglian Water's sources, potentially reducing any impacts of drought-related landscape or visual impacts.	Low (positive)	Low (positive)	Medium	Medium	Short-term	Temporary	No effect	Negligible positive

D.5 Drought Plan Action: Temporary Use Bans

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	A temporary use ban is considered to have no impact on biodiversity, flora and fauna, other than to acknowledge that reduced consumer demand for water will result in a reduced requirement for abstraction at Anglian Water's sources and, therefore, there is the potential for positive impacts on flow, sensitive habitats/species etc.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	A temporary use ban is considered to have no impact on fisheries, other than to acknowledge that reduced consumer demand for water will result in a reduced requirement for abstraction at Anglian Water's sources and, therefore, there is the potential for positive impacts on flow, sensitive habitats/species etc.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	The temporary use ban is likely to have no impact on avoiding the introduction or spreading of INNS, with reduced abstraction requirements leaving more water in river systems.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	A temporary use ban will provide water savings will contribute towards improving security of supply of water in the Anglian Water supply region. Drinking water quality will not be affected by the restrictions and the measures do not restrict essential water uses that are important in maintaining health and well-being of the population served by Anglian Water.	Medium (positive)	Medium (positive)	Medium	High	Short-term	Temporary	No effect	Moderate positive
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	The principal impact will be on domestic customers as the ban would preclude the use of water for those use categories set out under the temporary use ban powers. The ban may indirectly adversely impact business which benefit from the sale of certain water-using appliances such as hosepipes and sprinklers.	Medium (negative)	Medium (negative)	Medium	Medium	Short to Medium-term	Temporary	Moderate negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	Reducing the demand for non-essential water use is unlikely to have any impacts for recreation, tourism and navigation. There may be some limited domestic impact, for example not being able to refill or maintain a domestic swimming pool.	Medium (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	The ban will reduce the demand for water in the region, improving the efficiency of existing water resource use. It will not result in any increase in the generation of waste.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	No opportunities to promote the sustainable management of natural resources have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	The ban will not directly result in, or modify any abstraction (surface water or groundwater). Reduction in demand for demand for water will result in reduced requirement for abstraction from Anglian Water's sources, reducing the impacts on water levels and river flows in drought conditions.	Low (positive)	Medium (positive)	Medium	Medium	Medium-term	Temporary	No effect	Slight positive

SEA topics and objectives		Assessment of option								
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	Reductions in demand for water would result in reduced requirement for abstraction at source, reducing the risk of associated impacts on surface water quality in drought conditions.	Low (positive)	Medium (positive)	Medium	Low	Short-term	Temporary	No effect	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	Reductions in demand for water would result in reduced requirement for abstraction at source, reducing the risk of associated impacts on groundwater quality in drought conditions.	Low (positive)	Medium (positive)	Medium	Low	Short-term	Temporary	No effect	Slight positive
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	This option will have a beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. This may have medium to long-term impacts on consumer water usage.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	No impacts on geology, geomorphology and quality/quantity of soils are anticipated as a result of the temporary use ban.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	The ban will not involve an increase in energy consumption or associated greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.2 To maintain and improve air quality	No impacts on air quality are anticipated as a result of the temporary use ban.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Demand management measures are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought which may become more prevalent due to climate change.	Low (positive)	Medium (positive)	Small	High	Long-term	Permanent	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	There may be minor adverse impacts associated with the setting of some heritage assets, for example, visual impacts on registered parks and gardens and /or the grounds of listed buildings due to restrictions on the use of water for any non-essential purposes. Notwithstanding these impacts, the ban is considered unlikely to have any direct impact on the historic environment, heritage assets and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at Anglian Water's sources, potentially reducing the magnitude of any drought-related effects on archaeology and cultural heritage assets.	Low (positive) Low (negative)	Low (positive) Low (negative)	Medium	Medium	Medium-term	Temporary	Negligible negative	Negligible positive
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	There may be some localised adverse effects on townscapes and the setting of some visual amenities due to the ban on watering of gardens and grounds. However, the ban is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction from Anglian Water's sources, potentially reducing the magnitude of any drought-related effects on landscape or visual amenity.	Low (positive) Low (negative)	Low (positive) Low (negative)	Medium	Medium	Medium-term	Temporary	Negligible negative	Negligible positive

D.6 Drought Plan Action: Non-essential Use Ban

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	The ban is considered to have no impact on biodiversity, flora and fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction from Anglian Water's sources and, therefore, potential for positive impacts on flow, sensitive habitats/species etc.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	Reduced demand could reduce the need for abstraction during the drought or avoid the need for use of other Drought Permit options, which could have some slight positive secondary effects for fisheries.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	The ban is likely to have no impact on avoiding the introduction or spreading of INNS, with reduced abstraction requirements leaving more water in river systems.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	The ban will provide water savings which will contribute towards improving security of supply of water in the Anglian Water supply region. Drinking water quality will not be affected by the restrictions and there will be no impact on essential water uses that are necessary to maintain public health and well-being of the population served by Anglian Water.	Medium (positive)	Medium (positive)	Medium	High	Short-term	Temporary	No effect	Moderate positive
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	The ban carries the risk of some economic impact on businesses that benefit directly or indirectly from certain water uses that would be prohibited under the ban (e.g. sports and leisure facilities, window cleaning). The ban may result in some business loss if the water-related operations have to be suspended. Potential mitigation could involve publicity and consultation with the affected businesses in the run up to and during the drought.	High (negative)	Medium (negative)	Medium	Medium	Short-term	Temporary	Major negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	There may be potential for moderate impacts upon recreational activities due to restrictions on filling of swimming pools, watering of sports pitches, etc. There may be moderate impacts associated with the setting of tourist attractions, for example water features and parks/gardens associated with popular tourist sites.	Medium (negative)	Medium (negative)	Medium	Medium	Short-term	Temporary	Moderate negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	The ban will reduce the demand for water in the region, improving the efficiency of existing water resource use. It will not result in any increase in the generation of waste.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	No opportunities to promote the sustainable management of natural resources have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	The ban will not directly result in, or modify any abstraction (surface water or groundwater). Reduction in demand for demand for water will result in reduced requirement for abstraction from Anglian Water's sources, reducing the impacts on water levels and river flows in drought conditions.	Low (positive)	Medium (positive)	Medium	Medium	Medium-term	Temporary	No effect	Slight positive

SEA topics and objectives		Assessment of option								
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	Reductions in demand for water would result in reduced requirement for abstraction at source, reducing the risk of associated impacts on surface water quality in drought conditions.	Low (positive)	Medium (positive)	Medium	Low	Short-term	Temporary	No effect	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	Reductions in demand for water would result in reduced requirement for abstraction at source, reducing the risk of associated impacts on groundwater quality in drought conditions.	Low (positive)	Medium (positive)	Medium	Low	Short-term	Temporary	No effect	Slight positive
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	This option will have a beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. This may have medium to long-term impacts on consumer water usage.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	No impacts on geology, geomorphology and quality/quantity of soils are anticipated as a result of the temporary use ban.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	The ban will not involve an increase in energy consumption or associated greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.2 To maintain and improve air quality	No impacts on air quality are anticipated as a result of the temporary use ban.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Demand management measures are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought which may become more prevalent due to climate change.	Low (positive)	Medium (positive)	Small	High	Long-term	Permanent	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	There may be minor adverse impacts associated with the setting of some heritage assets, for example, visual impacts on registered parks and gardens and /or the grounds of listed buildings due to restrictions on the use of water for any non-essential purposes. Notwithstanding these impacts, the ban is considered unlikely to have any direct impact on the historic environment, heritage assets and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at Anglian Water's sources, potentially reducing the magnitude of any drought-related effects on archaeology and cultural heritage assets.	Low (positive) Low (negative)	Low (positive) Low (negative)	Medium	Low	Short-term	Temporary	Negligible negative	Negligible positive
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	There may be some localised adverse effects on townscapes and the setting of some visual amenities due to the ban on watering of gardens and grounds. However, the ban is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction from Anglian Water's sources, potentially reducing the magnitude of any drought-related effects on landscape or visual amenity.	Low (positive) Low (negative)	Low (positive) Low (negative)	Medium	Low	Short-term	Temporary	Negligible negative	Negligible positive

D.7 Drought Plan Action: Emergency Drought Orders (Level 4)

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	Emergency Drought Order restrictions are considered to have no impact on biodiversity, flora and fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction from Anglian Water's sources and, therefore, potential for positive impacts on flow, sensitive habitats/species etc. However, it is likely the natural drought severity would already be at a level that is damaging to the environment.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	Reduced demand could reduce the need for abstraction during the drought or avoid the need for use of other Drought Permit options, which could have some slight positive secondary effects for fisheries.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Emergency Drought Order restrictions are likely to have no impact on avoiding the introduction or spreading of INNS,.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	An emergency drought order will provide water savings which will contribute towards maintaining the provision of water supplies for priority essential uses, preventing a complete loss of supply to customers. Drinking water quality may be adversely affected due to the intermittent nature of supplies and there may be a requirement under certain circumstances for customers to boil water for potable uses to protect public health. Customers will face considerable disruption to their daily lives as a result of intermittent supply provision.	Medium (positive)	Medium (positive)	Medium	High	Short-term	Temporary	Major negative	Moderate positive
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	Depending on the scale of the required drought order demand restrictions, there could potentially be significant impacts on businesses/economy, particularly those that benefit directly or indirectly from water usage (e.g. window cleaning businesses, sports and leisure facilities, garden and landscape orientated businesses). Hotels and other holiday/tourist accommodation and camping sites will likely be adversely affected. In the worst case scenario, publicity regarding water restrictions may cause a loss of tourism revenue, as tourists delay or cancel trips to the affected area. Hospitality businesses are also likely to be adversely affected.	High (negative)	Medium (negative)	Medium	Medium	Short-term	Temporary	Major negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	Depending on the scale of the drought order restrictions, there could potentially be significant impacts on recreation and tourism, particularly activities that may benefit directly or indirectly from water usage (e.g. swimming pools, sports pitches, the setting of tourist attractions and visual impacts on the grounds of popular tourist sites).	Medium (negative)	Medium (negative)	Medium	Medium	Short-term	Temporary	Major negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	An emergency drought order will reduce the demand for water in the region, thereby reducing water resource use. It will not result in any increase in the generation of waste.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	No opportunities to promote the sustainable management of natural resources have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

SEA topics and objectives		Assessment of option								
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	Reduction in demand for demand for water will result in reduced requirement for abstraction from Anglian Water's sources, helping provide some protection for water-dependent ecosystems.	Low (positive)	Medium (positive)	Medium	Medium	Medium-term	Temporary	No effect	Slight positive
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	Reductions in demand for water would result in reduced requirement for increased abstraction from Anglian Water's sources, reducing associated impacts on surface water quality during drought conditions.	Low (positive)	Medium (positive)	Medium	Low	Short-term	Temporary	No effect	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	Reductions in demand for water would result in reduced requirement for increased abstraction from Anglian Water's sources, reducing associated impacts on groundwater quality during drought conditions.	Low (positive)	Medium (positive)	Medium	Low	Short-term	Temporary	No effect	Slight positive
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	This option will have a beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. This may have medium to long-term impacts on consumer water usage.	Low (positive)	Medium (positive)	Medium	Medium	Short-term	Temporary	No effect	Slight positive
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	No impacts on geology, geomorphology and quality/quantity of soils are anticipated as a result of the temporary use ban.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	The ban will not involve an increase in energy consumption or associated greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.2 To maintain and improve air quality	No impacts on air quality are anticipated as a result of the temporary use ban.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	The drought order is a last resort to maintain priority essential water supplies to customers; as such it is not a measure that improves the resilience of the water supply system to climate change threats.	High (negative) Low (positive)	Medium (negative) Low (positive)	Small	High	Short-term	Temporary	Major negative	Negligible positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	There may be minor adverse impacts associated with the setting of some heritage assets, for example, visual impacts on registered parks and gardens and /or the grounds of listed buildings due to restrictions on the use of water for any non-essential purposes. Notwithstanding these impacts, the ban is considered unlikely to have any direct impact on the historic environment, heritage assets and archaeologically important sites. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction at Anglian Water's sources, potentially reducing the magnitude of any drought-related effects on archaeology and cultural heritage assets.	Low (positive) Low (negative)	Low (positive) Low (negative)	Medium	Low	Short-term	Temporary	Negligible negative	Negligible positive
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	There may be some localised adverse effects on townscapes and the setting of some visual amenities due to the ban on watering of gardens and grounds. However, the ban is considered to have no direct impact on landscape and visual amenity or any changes to access to the countryside or open space. There is the potential for reduced consumer demand for water to result in reduced requirement for abstraction from Anglian Water's sources, potentially reducing the magnitude of any drought-related effects on landscape or visual amenity.	Low (positive) Low (negative)	Low (positive) Low (negative)	Medium	Low	Short-term	Temporary	Negligible negative	Negligible positive

D.8 Drought Plan Action: River Colne Augmentation (Ardleigh Reservoir)

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	No LSEs (Likely Significant Effects) have been identified for internationally or nationally designated sites. The EAR has identified minor positive impacts on Bulls Meadow LNR due to increased wetted width and increased habitat availability. The EAR identified that flows, levels and water quality are unlikely to be significantly, permanently affected as a result of the drought permit. With minor increases for Reach 2 only and negligible increases elsewhere. Moderate impacts have been identified for NERC species bullhead and european eel due to increased flows and wetted width resulting in flushing and sedimentation of important habitats. Increased stress and competition could result in decreased growth, morphological change and/or alteration to feeding and migration. The minor changes in the physical environment as a result of drought permit implementation pose minor risks to macroinvertebrate, macrophyte and diatom commmunities in Reach 2 only.	Medium (negative) Low (positive)	High (negative) Medium (positive)	Small	Low	Short to Medium-term	Temporary	Moderate negative	Slight positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	The EAR has identified moderate impacts to fish communities as a result of increased flows and water levels. Riffle habitats, important for spawning and juvenile development may be impacted and altered as a result of increased velocities. The increase in flows and water levels predicted due to drought permit implementation may result in a positive change for fisheries communities.	Medium (negative) Low (positive)	Medium (negative) Medium (positive)	Small	Low	Short to Medium-term	Temporary	Moderate negative	Slight positive
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	No INNS features that are sensitive or susceptible to drought permit impacts have been identified within the impacted reaches of the River Colne.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects of a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	The Environmental Report identifies that additional groundwater abstraction for the drought permit's flow augmentation scheme is predicted to cause a groundwater drawdown of 0.2m in a localised area of the Chalk aquifer, approximately 3km from the Lower Colne boreholes. Fourteen groundwater abstraction licences fall within the radius of influence (two industrial, one other potable use and 11 agricultural), and it is possible that these abstractors may be adversely impacted by the drought action. However, without further knowledge of the abstraction licence conditions or infrastructure it is not possible to quantify this potential impact. As a precaution, this risk has been assessed as moderate.	Medium (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect

SEA topics and objectives		Assessment of option								
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	The River Colne is not navigable in the affected reach therefore there would be no effects on navigation as a result of the Drought Permit. However, it used by canoeists and rowing boats, as well as being a popular destination for anglers. These recreational activities may become more viable when the proposed drought permit is in action than they would otherwise be during periods of low flow due to augmentation by abstractions from groundwater. A summer drought permit may increase the potential for algal blooms, thus impact the aesthetic quality of the river.	Low (negative) Low (positive)	Low (negative) Medium (positive)	Small	Low	Short-term	Temporary	Negligible negative	Slight positive
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	Increases in abstraction (up to 6 Ml/d) over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	This option will ensure maintenance of water supplies during drought, providing a total of 6Ml/d to top up Ardleigh Reservoir.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	The Environmental Report concluded that impacts on surface water flows and levels due to the drought action in comparison to the modelled baseline flows are largely negligible, with minor impacts identified for Reach 2 only. Flows will be increased by up to 6Ml/d between Cook's Mill and the East Mills intake during the operation of the proposed drought permit. While river flows increase accordingly with increased augmentation, the effects are most pronounced during periods when the baseline flow is very low (e.g. < 30Ml/d). The WFD status of the potentially affected waterbodies would likely be impacted through a change in flows or a change in water quality. However, as the impacts of the potential drought action on river levels and flows and water quality are thought to be temporary and minor/negligible, no permanent impacts on the WFD status of the potentially affected waterbodies are perceived.	Low (positive)	Low (positive)	Small	Medium	Short-term	Temporary	No effect	Negligible positive
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	There is the potential for surface water quality improvements due to augmented flow enabling greater dilution of nutrients and other pollutants. However, there is also potential for a decrease in surface water quality if groundwater quality is low, but this should be prevented by cessation of groundwater abstraction if groundwater quality is poor. Overall, the potential for a detrimental effect on surface water quality is low. The EAR identified minor impacts on water quality, with resepct to orthophosphate, in Reach 2 only. Elsewhere impacts were assessed as negligible.	Low (negative) Low (positive)	Medium (negative) Medium (positive)	Small	Low	Short-term	Temporary	Slight negative	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	The EAR identified that the modelled drought action scenario revealed a clear drawdown relative to groundwater levels under a normal (non-drought) abstraction scenario, which was attributed to the additional abstraction at the Aldham and Balkerne sources. An additional 1.4m and 1.2m drawdown was predicted at the respective sources. The abstraction effects are expected to be relatively localised, with a radius of approximately 3km, where there was a localised drawdown of 0.2m. No predicted change in groundwater-surface interaction due to increase in abstraction following the application of the proposed Drought Permit for a three-month period. It is possible that there would be greater changes if the drought permit were to be in operation for 6 or 12 months, but in view of the limited change for a 3-month period it is unlikely that changes over a longer period would be significant.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

SEA topics and objectives		Assessment of option								
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	The EAR identified minor impacts to geomorphology. Minor positive impacts in summer due to increased abilitiy to maintain sediment transport and minor negative impacts in winter due to increased sediment movement and potential erosion.	Low (negative) Low (positive)	Low (negative) Low (positive)	Small	Low	Short-term	Temporary	Negligible negative	Negligible positive
Air and Climate	6.1 To reduce greenhouse gas emissions	Short-term increases in greenhouse gas emissions will occur due to increased abstraction (up tp 6Ml/d). However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.2 To maintain and improve air quality	The abstraction locations are in close proximity to AQMAs, however, no construction is required and additonal emmisions associated with increased abstraction is minimal.	Low (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary		Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	There are a number of historic environment remains and features within the potential zone of influence. There is considered to be negligible impacts on those alongside the River Colne as no significant impacts on surface water have been identified. Slight risk associated with the drawdown in groundwater levels potentially affecting nearby Scheduled Monuments and listed buildings, although this would be in the context of already low groundwater levels due to prolonged low rainfall. Furthermore, the Chalk aquifer is confined by 10-40m of overlying London Clay and impacts in terms of groundwater drawdown are not predicted in the water table or the river flows outside the augmented reach.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	No construction activities are required for this option. The option is not located in proximity to any designated landscapes. Increased flow in the River Colne as a result of the drought permit may increase the aesthetic of the landscape opposed to drought conditions.	Low (positive)	Low (positive)	Small	Medium	Short-term	Temporary	No effect	Negligible positive

D.9 Drought Plan Action: River Wensum (Costessey Boreholes)

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	Objective	Indicator questions	Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary	Magnitude of effect (Low/Medium/High)	Value/ sensitivity of receptor (Low/Medium/High)	Scale of effect: geographical &/or population affected (Small/Medium/Large)	Certainty of effect (Low/Medium/High)	Duration of effect (Short-term/Medium-term/Long-term)	Permanence of effect (Permanent/ Temporary)	Residual adverse effect significance (likely to remain after reasonable mitigation)	Residual beneficial effect significance (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	•Is the option likely to affect the conservation status of any SPA/SACs, Ramsar sites, SSSIs or locally designated sites? •Is the option likely to affect ancient woodland, BAP habitats and/or protected and BAP species? ·Will the option affect any habitats that support legally protected species or species of conservation concern? •Is there potential for contribution to achieving 'favourable' conservation status or for creation of new BAP habitats? •Would the option protect and enhance aquatic and terrestrial habitats and species? ·Will it affect WFD compliance e.g. good ecological potential/status? •Are there any opportunities for habitat creation or restoration? ·Will it protect or enhance natural capital and ecosystem services? ·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?	The EAR identifies potential for negative effects on qualifying features of the River Wensum SAC/SSSI. In particular, the HRA suggests that LSE on Desmoulin's whorl snail cannot be ruled out given the groundwater abstraction levels which may result in changes to water quality and habitat availability.The Stage II Appropriate Assessment concluded that with the inclusion of mitigation measures, uncertainty remained regarding the potential adverse effects on site integrity of the River Wensum (Costessey groundwater sources) on the River Wensum SAC and associated qualifying features. Following the collection of monitoring data and its analysis, the Stage 2 assessment will need to be revisited, to update the outcome and to provide confirmation on the appropriate mitigation measures that could reduce the potential for adverse effects. There are a number of Local Wildlife Sites in proximity to the abstraction locations, the assessment in the EAR has assumed that any potential impacts on these would be similar to that of the Natura 2000 sites. Other habitats identified at risk include Chalk River, lowland fen and meadow and coastal and floodplain grazing marsh. Impacts on these habitats are thought to be moderate due to groundwater abstractions causing delays in water recharge which has knock-on effects on the River Wensum. The EAR further outlines that minor hydrological changes in the River Wensum, in the form of reduced flow and wetted width, may result in moderate impacts on a number of species. These include; white clawed crayfish, bullhead, brook lamprey, brown trout and European eel. Negligible positive impacts have been identified for otter due to increased efficiency of predation.	Medium (negative) Low (positive)	High (negative) Medium (positive)	Small	Low	Short-term	Temporary	Major negative	Negligible positive
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	•Does the option location affect any important fisheries (salmonid or cyprinid)? •Are there potential indirect impacts (e.g. from affecting other aspects of aquatic ecology (habitat or food species) upon which fish rely)? •Are there opportunities to improve fish migration or could migration be impeded?	The EAR further outlines that minor hydrological changes in the River Wensum, in the form of reduced flow and wetted width, may result in moderate impacts on a number of fish species. These include; white clawed crayfish, bullhead, brook lamprey, brown trout and European eel. The impact of lower river flows on bullhead may be compounded by low DO levels, but no significant impacts are expected as long as DO saturation is above 60%. Other issues could be caused by increased sedimentation and velocity changes. Pit 1 at Costessey Pits is expected to dry out, whilst the other pits and Taverham Lake may suffer a deterioration in water quality that could adversely affect the fish populations. Modelled changes to flows in the River Tud, River Yare and Spixworth Beck are negligible, and hence river level changes in these watercourses and associated impacts on fish are expected to be negligible.	Medium (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	·Will it limit, reduce or increase the risk of spread of Invasive Non-Native Species (INNS) or occurrence of algal blooms?	No INNS features that are sensitive or susceptible to drought permit impacts have been identified within the impacted reaches of the River Colne.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	•Is there potential for health and/or quality of life to be adversely or positively affected? ·Will it help to protect or improve drinking water quality? ·Will it raise awareness of the importance and value of the water environment for health and well-being?	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects of a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	•Are there any pathways for effects on local businesses or other economic interests that rely on water and/or that may have licences connected to the water bodies affected? •Are there potential adverse or positive effects on tourism? ·Will it help to ensure access to a secure and affordable supply of drinking water? ·Will it assist in ensuring provision of essential infrastructure services to support a sustainable economy?	The DP19 EAR identifed eight licensed abstractors and six unlicensed historical protected rights within a 5km radius of the Costessey boreholes, many of which are to support agricultural practices. There are potential impacts but without further information on the licences it is not possible to assess the extent of these impacts. However, mitigation measures may be required if there is additional drawdown of more than 0.7m. The Protected Rights identified were all connected to mains supply and there are no Protected Rights on the current Costessey license. However, mitigation measures will be required if any of these are still in use, as impacts are more significant at these locations. The potential impact has been assumed moderate for both summer and winter permit operation.	Medium (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	·Will the option impact on any formal or informal recreational areas, parks, recreational facilities, and national trails/footpaths/access? •Are there opportunities to create new/additional recreational facilities, or potential to increase amenity/ access to riverside/countryside? ·Will the use of rivers or other water bodies (e.g. reservoirs) for angling, birdwatching, water sports or navigation be affected?	The EAR identified that there are no anticipated impacts on navigation as the change in depth is not expected to be significant. The modelled reduction in levels may affect Costessey Pits and Taverham Lake, which could negatively affect fishing stocks and recreational uses, particularly in Pit 1, which is expected to dry out. In the other pits and Taverham Lake, a reduction in levels may cause a deterioration in water quality, which could also negatively impact fishing stocks. Reduced river flow in the River Wensum may affect fish populations. Modelled changes to flows in the River Tud, River Yare and Spixworth Beck are negligible, and hence impact of the drought action on recreational activities is expected to be negligible in these watercourses.	Medium (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	••Will it help to minimise the demand for resources (including water)? ·Will it minimise the use of energy and promote energy efficiency? ·Will it make use of existing infrastructure? ·Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? ·Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	·Will it help to minimise the demand for resources (including water)? ·Will it enable efficient water resource management and ensure maintenance of water supplies?	This option will ensure maintenance of water supplies during drought, providing up to 2,800Ml/year benefit.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	•Does the option take into account requirements for sustainability reductions, CAMs assessments of water availability, and the sensitivity of surface and groundwater to abstraction? Will there be a conflict with any of these requirements? ·Will it enable a sustainable use of water resources that balances demand for water with environmental protection? ·Will it alter the flow or level regime or residence time of surface waters or groundwaters? •Is there potential to help ameliorate low flows?	Groundwater modelling estimates an additional drawdown of 4-5m would occur at the Costessey Borehole source as a result of drought permit implementation. This results in minor impacts to the hydrological regime, constrained to Reach 2 in summer only and Reach 3 in summer and winter. Elsewhere in the River Wensum, the River Tud and River Yare is assessed as negligible.	Low (negative)	Medium (negative)	Small	Medium	Short-term	Temporary	Slight negative	No effect

SEA topics and objectives		Assessment methodology	Assessment of option								
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	•Is the option likely to affect biological or chemical quality elements? •Would the option affect flow regimes or significantly change water levels? •Is there potential for physical effects on the river channel and/or hydromorphology of watercourse(s)? •Would the option help or conflict with meeting WFD objectives for preventing deterioration and achieving good ecological status? •For Heavily Modified water bodies, would the option contribute to or prevent the implementation of mitigation measures specified in the River Basin Management Plan? •Will it affect bathing water compliance?	The EAR indicates minor impacts on water quality (specifically orthophosphate) in summer only due to the sensitivty of orthophosphate to flow changes. The impacts are expected to be greater in summer, due to lower residual flows than in winter. These impacts are considered to be localised to part of the River Wensum and temporary.	Low (positive)	Medium (positive)	Small	Low	Short-term	Temporary	Slight negative	No effect
Water	4.3 To protect and enhance groundwater quantity and quality	•Is there the potential to affect groundwater quality (including contamination, saline intrusion etc)? •Would the option affect groundwater flows or significantly change groundwater levels? •Could the option have any other effects that could cause deterioration in groundwater status under the WFD? •Could the option contribute to meeting WFD status objectives for any groundwater bodies?	Groundwater levels will fall if the Costessey groundwater source was used in the event of an extreme drought. There is potential for a maximum additional drawdown of 4m to 5m within close vicinity of the groundwater source, however impacts would reduce with distance.	Low (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	•Will it encourage efficient water use? •Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	•Will it avoid damage to and protect geologically important sites? •Will it protect and enhance the quality of soils? •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?	The EAR identified largely negligible impacts to geomorpholgy. If operated in summer, minor reductions to flow in Reach 2 would induce changes to sediment loading, transport and erosion or deposition resulting in a minor impact to this reach only.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	•Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions? •Is there potential to offset energy use or contribute to renewable energy generation? •Will it reduce or minimise greenhouse gas emissions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.2 To maintain and improve air quality	•Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)? •Will it reduce or minimise air pollutant and greenhouse gas emissions?	No construction is required and additonal emmisions associated with increased abstraction is minimal.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	•Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? •Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	•Could the option affect (directly or via their setting) any historic, cultural, and archaeological sites, e.g. Scheduled Ancient Monuments, listed buildings, Registered Parks and Gardens, Conservation Areas, historic landscapes? •Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? •Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are few scheduled monuments in the potential zone of influence. Further short-term drawdown groundwater levels and river levels within the River Wensum, Tud, Yare and the Spixworth Beck could potentially affect nearby designations and buried archaeology, although this would be in the context of already low river and groundwater levels due to prolonged low rainfall. Further investigation should confirm the nature and magnitude of the impacts, as described above.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	•Will it avoid adverse effects and enhance designated landscapes? •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 improve access to valued areas of landscape character?	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

D.10 Drought Plan Action: River Great Ouse: Offord Intake (Grafham Water) - Summer Permit

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	Objective	Indicator questions	Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary	Magnitude of effect (Low/Medium/High)	Value/ sensitivity of receptor (Low/Medium/High)	Scale of effect: geographical &/or population affected (Small/Medium/Large)	Certainty of effect (Low/Medium/High)	Duration of effect (Short-term/Medium-term/Long-term)	Permanence of effect (Permanent/ Temporary)	Residual adverse effect significance (likely to remain after reasonable mitigation)	Residual beneficial effect significance (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	-Is the option likely to affect the conservation status of any SPA/SACs, Ramsar sites, SSSIs or locally designated sites? -Is the option likely to affect ancient woodland, BAP habitats and/or protected and BAP species? -Will the option affect any habitats that support legally protected species or species of conservation concern? -Is there potential for contribution to achieving 'favourable' conservation status or for creation of new BAP habitats? -Would the option protect and enhance aquatic and terrestrial habitats and species? -Will it affect WFD compliance e.g. good ecological potential/status? -Are there any opportunities for habitat creation or restoration? -Will it protect or enhance natural capital and ecosystem services? -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?	A Stage 2 HRA Appropriate Assessment concluded that implementing the drought permit could result in LSEs on qualifying features of the Ouse Washes SPA, SAC and Ramsar site due to reductions in flow and subsequent deterioration in water quality (particularly orthophosphate and dissolved oxygen concentrations) as well as increased siltation (more likely in summer). A comprehensive monitoring and mitigation approach has been defined and if this is implemented, no residual adverse effects on qualifying features are anticipated. The EAR has identified major hydrological and water quality impacts (Stage 2) resulting in signifcant impacts on a number of NERC and notable species, including; spined loach, bullhead, european eel and european smelt as well as fish communities for Stage 2. Moderate impacts were concluded for water vole, macroinvertebrates, macrophytes and diatom communities. A number of Local Wildlife Sites and habitats such as coastal and floodplain grazing marsh also have moderate impacts in winter due to flow dependant features.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	-Does the option location affect any important fisheries (salmonid or cyprinid)? -Are there potential indirect impacts (e.g. from affecting other aspects of aquatic ecology (habitat or food species) upon which fish rely)? -Are there opportunities to improve fish migration or could migration be impeded?	The EAR identified that changes in water level will be limited because of the structural controls that are currently present to maintain navigation. Deterioration in water quality, specifically orthophosphate concentrations and reduced flow and wetted width are more pronounced in summer. The majority of fish species present will be spawning in summer and the a reduction in water level could lead to exposure and/or loss of habitat (including exposure of eggs to dessication stress) whilst flow reduction could induce sedimentation of spawning gravels. There is potential for greater reduction of flows in winter, however, fish are less likely to be spawning during that period. Overall impact to fisheries is considered moderate if appropriate mitigation is implemented.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	-Will it limit, reduce or increase the risk of spread of Invasive Non-Native Species (INNS) or occurrence of algal blooms?	No INNS features that are sensitive or susceptible to drought permit impacts have been identified within the impacted reaches of the River Ouse.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	-Is there potential for health and/or quality of life to be adversely or positively affected? -Will it help to protect or improve drinking water quality? -Will it raise awareness of the importance and value of the water environment for health and well-being?	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects of a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	-Are there any pathways for effects on local businesses or other economic interests that rely on water and/or that may have licences connected to the water bodies affected? -Are there potential adverse or positive effects on tourism? -Will it help to ensure access to a secure and affordable supply of drinking water? -Will it assist in ensuring provision of essential infrastructure services to support a sustainable economy?	During summer, water is abstracted from a tidal reach of the river into the Counter Drain for IDBs to abstract for spray irrigation. Reduced flow may mean the demand cannot be met.	Medium (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	-Will the option impact on any formal or informal recreational areas, parks, recreational facilities, and national trails/footpaths/access? -Are there opportunities to create new/additional recreational facilities, or potential to increase amenity/ access to riverside/countryside? -Will the use of rivers or other water bodies (e.g. reservoirs) for angling, birdwatching, water sports or navigation be affected?	During a summer permit, the EA's ability to maintain the navigable water depth will be reduced due to lower flows. Lock operations may be limited, which may restrict boat movements. Algal blooms are more likely at this time of year and may cause the river to choke, inhibiting navigation as well as degrade the aesthetic quality of the River Great Ouse - affecting walkers and cyclists. The EAR identified that changes to river levels can also affect stationary boats along the River Great Ouse, many of which are focussed in two marinas between Godmanchester and Houghton. Boats are prone to tipping when river levels fall below the minimum draught, causing appliances and services to stop working correctly. The predicted negative impact on fish health and migration has the potential to affect anglers and reduced flows associated with the drought permit affect other recreational activities in the summer months. It is important to note that these effects will be in the context of natural drought already occuring.	Medium (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	-Will it help to minimise the demand for resources (including water)? -Will it minimise the use of energy and promote energy efficiency? -Will it make use of existing infrastructure? -Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? -Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	-Will it help to minimise the demand for resources (including water)? -Will it enable efficient water resource management and ensure maintenance of water supplies?	This option will ensure maintenance of water supplies during drought.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive

SEA topics and objectives		Assessment methodology	Assessment of option								
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	-Does the option take into account requirements for sustainability reductions, CAMs assessments of water availability, and the sensitivity of surface and groundwater to abstraction? Will there be a conflict with any of these requirements? -Will it enable a sustainable use of water resources that balances demand for water with environmental protection? -Will it alter the flow or level regime or residence time of surface waters or groundwaters? -Is there potential to help ameliorate low flows?	The Environmental Assessment identified that the impacts of the proposed Stage 2 drought permit are considered to be more severe than those of the proposed Stage 1 drought permit on river flows. Major hydrological impacts are anticipated in summer during Stage 2. It is not expected that either Stage of the proposed drought permit would permanently affect the overall status of the River Great Ouse at Offord through a change in flows. Although the predicted flows do not fall into the range of acceptable flows proposed by the WFD to maintain Good status, the assessment has shown that the flows at the current MRF fall outside this range also. Given the temporary nature of the predicted reduction in flows, it is likely that the effects on WFD status would cause deterioration to the Moderate category for the duration of the drought, but this would also be temporary.	Medium (negative)	Medium (negative)	Small	Medium	Short-term	Temporary	Moderate negative	No effect
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	-Is the option likely to affect biological or chemical quality elements? -Would the option affect flow regimes or significantly change water levels? -Is there potential for physical effects on the river channel and/or hydromorphology of watercourse(s)? -Would the option help or conflict with meeting WFD objectives for preventing deterioration and achieving good ecological status? -For Heavily Modified water bodies, would the option contribute to or prevent the implementation of mitigation measures specified in the River Basin Management Plan? -Will it affect bathing water compliance?	The EAR concluded there is potential for major impacts on orthophosphate concentrations (Stage 1, Reach 1) and minor risks associated with dissolved oxygen and ammonia concentrations increasing to a level that has potential to impact the WFD status of the water body. Water quality deterioration also has the potential to result in likely significant effects on some interest features of the Ouse Washes European sites. Increases in nitrate are not perceived to have a significant impact on freshwater stretches as nitrate is unlikely to be a limiting factor and the tidal volumes of water are considered to reduce the impact on tidal stretches. Maintaining water levels in Grafham Water during drought periods will have an incidental benefit of reducing the risk of reduced water quality and algal blooms in the reservoir.	Medium (negative) Medium (positive)	Medium (negative) Low (positive)	Small	Low	Short-term	Temporary	Moderate negative	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	-Is there the potential to affect groundwater quality (including contamination, saline intrusion etc)? -Would the option affect groundwater flows or significantly change groundwater levels? -Could the option have any other effects that could cause deterioration in groundwater status under the WFD? -Could the option contribute to meeting WFD status objectives for any groundwater bodies?	No impacts identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	-Will it encourage efficient water use? -Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	-Will it avoid damage to and protect geologically important sites? -Will it protect and enhance the quality of soils? -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?	The EAR identified minor impacts to geomorophology when the drought permit is implemented in winter due to the increased flows in winter offsetting any potential impacts as a result of minor flow reductions.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	-Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions? -Is there potential to offset energy use or contribute to renewable energy generation? -Will it reduce or minimise greenhouse gas emissions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.2 To maintain and improve air quality	-Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)? -Will it reduce or minimise air pollutant and greenhouse gas emissions?	No construction is required and additonal emmisions associated with increased abstraction is minimal.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	•Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? -Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	-Could the option affect (directly or via their setting) any historic, cultural, and archaeological sites, e.g. Scheduled Ancient Monuments, listed buildings, Registered Parks and Gardens, Conservation Areas, historic landscapes? -Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? -Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are numerous historic environment remains and features within the potential zone of influence. This includes a number of sheduled monuments adjacent to the impacted reaches. Key risk would be associated with a further short-term drawdown in river levels potentially affecting riverside designations and buried archaeology, although this would be in the context of already low river flows due to prolonged low rainfall.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	-Will it avoid adverse effects and enhance designated landscapes? -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 improve access to valued areas of landscape character?	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

D.11 Drought Plan Action: River Great Ouse: Offord Intake (Grafham Water) - Winter Permit

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	-Is the option likely to affect the conservation status of any SPA/SACs, Ramsar sites, SSSIs or locally designated sites? -Is the option likely to affect ancient woodland, BAP habitats and/or protected and BAP species? •Will the option affect any habitats that support legally protected species or species of conservation concern? -Is there potential for contribution to achieving 'favourable' conservation status or for creation of new BAP habitats? -Would the option protect and enhance aquatic and terrestrial habitats and species? •Will it affect WFD compliance e.g. good ecological potential/status? -Are there any opportunities for habitat creation or restoration? •Will it protect or enhance natural capital and ecosystem services? •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?	A Stage 2 HRA Appropriate Assessment concluded that implementing the drought permit could result in LSEs on qualifying features of the Ouse Washes SPA, SAC and Ramsar site due to reductions in flow and subsequent deterioration in water quality (particularly orthophosphate and dissolved oxygen concentrations) as well as increased siltation (more likely in summer). A comprehensive monitoring and mitigation approach has been defined and if this is implemented, no residual adverse effects on qualifying features are anticipated. The EAR has identfied moderate impacts on a number of NERC and notable species, including; spined loach, bullhead, european eel and water vole as well as fish communities for Stage 1 and Stage 2. A number of Local Wildlife Sites and habitats such as coastal and floodplain grazing march also have moderate impacts in winter due to flow dependant features.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	-Does the option location affect any important fisheries (salmonid or cyprinid)? •Are there potential indirect impacts (e.g. from affecting other aspects of aquatic ecology (habitat or food species) upon which fish rely)? -Are there opportunities to improve fish migration or could migration be impeded?	The EAR identified that changes in water level will be limited because of the structural controls that are currently present to maintain navigation. Reduced flow and wetted width could resilt in exposure/loss of important habitats (e.g. spawning gravels and nursery habitat). The EAR identifies moderate impacts in water for Stage 1 and Stage 2 on bullhead, spined loach and euopean eel. Additional moderate impacts are identified for fish communities due to potential loss and/or fragmentation of habitats. Overall impact to fisheries is considered slight negative if appropriate mitigation is implemented.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	•Will it limit, reduce or increase the risk of spread of Invasive Non-Native Species (INNS) or occurrence of algal blooms?	No INNS features that are sensitive or susceptible to drought permit impacts have been identified within the impacted reaches of the River Ouse.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value o the water environment for health and well-being	-Is there potential for health and/or quality of life to be adversely or positively affected? •Will it help to protect or improve drinking water quality? •Will it raise awareness of the importance and value of the water environment for health and well-being?	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects of a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	-Are there any pathways for effects on local businesses or other economic interests that rely on water and/or that may have licences connected to the water bodies affected? -Are there potential adverse or positive effects on tourism? •Will it help to ensure access to a secure and affordable supply of drinking water? •Will it assist in ensuring provision of essential infrastructure services to support a sustainable economy?	The Environmental Assessment has identified no impacts on other licensed abstractors as the winter Drought Permit is not likely to impact water levels. During winter, there is no flow demand for spray irrigation from other abstractors.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	•Will the option impact on any formal or informal recreational areas, parks, recreational facilities, and national trails/footpaths/access? •Are there opportunities to create new/additional recreational facilities, or potential to increase amenity/ access to riverside/countryside? •Will the use of rivers or other water bodies (e.g. reservoirs) for angling, birdwatching, water sports or navigation be affected?	Navigation reduces during winter meaning the EA's ability to maintain the navigable water depth should improve. The EAR identified that changes to river levels can also affect stationary boats along the River Great Ouse, many of which are focussed in two marinas between Godmanchester and Houghton. Boats are prone to tipping when river levels fall below the minimum draught, causing appliances and services to stop working correctly. The predicted negative impact on fish health and migration has the potential to affect anglers. Recreational usage of the river is reduced in winter. The occurrence of algal blooms, which may degrade the aesthetic quality of the River Great Ouse and potentially affect walkers and cyclists, are less likely in the winter.	Low (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	••Will it help to minimise the demand for resources (including water)? •Will it minimise the use of energy and promote energy efficiency? •Will it make use of existing infrastructure? •Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? •Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	•Will it help to minimise the demand for resources (including water)? •Will it enable efficient water resource management and ensure maintenance of water supplies?	This option will ensure maintenance of water supplies during drought.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	•Does the option take into account requirements for sustainability reductions, CAMs assessments of water availability, and the sensitivity of surface and groundwater to abstraction? Will there be a conflict with any of these requirements? •Will it enable a sustainable use of water resources that balances demand for water with environmental protection? •Will it alter the flow or level regime or residence time of surface waters or groundwaters? -Is there potential to help ameliorate low flows?	The Environmental Assessment identified that the impacts of the proposed Stage 2 drought permit are considered to b more severe than those of the proposed Stage 1 drought permit on river flows. Flows will be affected during the winter drought permit, and it is possible that a reduction in flows will be greater in winter than summer. It is not expected that either Stage of the proposed drought permit would permanently affect the overall status of the River Great Ouse at Offord through a change in flows. Although the predicted flows do not fall into the range of acceptable flows proposed by the WFD to maintain Good status, the assessment has shown that the flows at the current MRF fall outside this range also. Given the temporary nature of the predicted reduction in flows, it is likely that the effects on WFD status would cause deterioration to the Moderate category for the duration of the drought, but this would also be temporary.	Medium (negative)	Medium (negative)	Small	Medium	Short-term	Temporary	Moderate negative	No effect

SEA topics and objectives		Assessment methodology	Assessment of option								
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	-Is the option likely to affect biological or chemical quality elements? -Would the option affect flow regimes or significantly change water levels? -Is there potential for physical effects on the river channel and/or hydromorphology of watercourse(s)? -Would the option help or conflict with meeting WFD objectives for preventing deterioration and achieving good ecological status? -For Heavily Modified water bodies, would the option contribute to or prevent the implementation of mitigation measures specified in the River Basin Management Plan? •Will it affect bathing water compliance?	The EAR concluded there is potential for moderate impacts on orthophosphate concentrations (Stage 1, Reach 1) and minor risks associated with dissolved oxygen and ammonia concentrations increasing to a level that has potential to impact the WFD status of the water body. Water quality deterioration also has the potential to result in likely significant effects on some interest features of the Ouse Washes European sites. Increases in nitrate are not perceived to have a significant impact on freshwater stretches as nitrate is unlikely to be a limiting factor and the tidal volumes of water are considered to reduce the impact on tidal stretches. Maintaining water levels in Grafham Water during drought periods will have an incidental benefit of reducing the risk of reduced water quality and algal blooms in the reservoir.	Medium (negative) Medium (positive)	Low (negative) Low (positive)	Small	Low	Short-term	Temporary	Slight negative	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	-Is there the potential to affect groundwater quality (including contamination, saline intrusion etc)? -Would the option affect groundwater flows or significantly change groundwater levels? -Could the option have any other effects that could cause deterioration in groundwater status under the WFD? -Could the option contribute to meeting WFD status objectives for any groundwater bodies?	No impacts identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	•Will it encourage efficient water use? •Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	•Will it avoid damage to and protect geologically important sites? •Will it protect and enhance the quality of soils? •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?	The EAR identified minor impacts to geomorpholgy when the drought permit is implemented in winter due to the increased flows in winter offsetting any potential impacts as a result of minor flow reductions.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	•Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions? -Is there potential to offset energy use or contribute to renewable energy generation? •Will it reduce or minimise greenhouse gas emissions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.2 To maintain and improve air quality	•Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)? •Will it reduce or minimise air pollutant and greenhouse gas emissions?	No construction is required and additonal emmisions associated with increased abstraction is minimal.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	•Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? •Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	-Could the option affect (directly or via their setting) any historic, cultural, and archaeological sites, e.g. Scheduled Ancient Monuments, listed buildings, Registered Parks and Gardens, Conservation Areas, historic landscapes? •Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? •Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are numerous historic environment remains and features within the potential zone of influence. This includes a number of sheduled monuments adjacent to the impacted reaches. Key risk would be associated with a further short-term drawdown in river levels potentially affecting riverside designations and buried archaeology, although this would be in the context of already low river flows due to prolonged low rainfall.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	•Will it avoid adverse effects and enhance designated landscapes? •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 improve access to valued areas of landscape character?	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

D.12 Drought Plan Action: River Nene (Pitsford) Summer Permit

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	The EAR concluded negligible LSEs for the Nene Washes SAC/SPA/Ramsar/SSSI, located 11.95km downstream of the Wansford intake. Structural controls on the Nene Washes mean that the impacts of decreased flow and water levels in the River Nene (e.g. sedimentation changes and/or habitat loss) will not be replicated within the designated site. However, water quality impacts associated wih reduced dilution capacity from reduced flows are possible as pollutants discharged into the River Nene downstream of the abstraction will have a greater impact on water quality than they would do under normal, non-drought conditions. Hydrological and water quality impacts at the Reaches 5 and 6 are negligible in summer therefore the impact on the designated site is considered negligible. The hydrological impacts in summer have been assessed as major-moderate in the upper reaches and minor and negligible downstream. The impact would manifest as reduction in flows and wetted width which would reduce habitat availability and result in major impacts to fish and moderate impacts to invertebrate, macrophyte and diatom communities. The EAR also identified major impacts for NERC species Spined Loach and moderate impacts on Bullhead due to loss of important habitats and increased stress and competition. Moderate impacts are anticipated for a number of LNRs and LWS. Impacts reduce downstream as physical environment changes lessen.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	Major to moderate impacts to water quality (orthophosphate only) and reductions in flow and wetted width have potential to impact fish communities, posing major risk to the fish component of the Nene WFD water body. Major impacts to NERC fish species spined loach are possible due to loss of important habitats, increased stress and competition and increeased mortality due to increased predation. Minor impacts to European eel are anticipated.	Low (negative)	High (negative)	N/A	N/A	N/A	N/A	Moderate negative	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	Implementation of the drought permit has the potential to spread the chinese mitten crab from impacted reaches (Reaches 5 and 6) to other waterbodies. The hydrological impact in these reaches in summer is negligible, therefore the impacts are considered negligible in summer only.	Low (negative)	Low (negative)	Small	Low	Medium-term	Permanent	Negligible negative	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects of a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	Spray irrigators could be affected by reduced water levels in summer months.	Medium (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	Water levels in the main channel are controlled by locks, tilting gates and weirs, where a minimum navigable depth of 1.8m must be maintained. Navigation peaks in summer months, lock operations and demand for water will be higher. Recreational activities such as walking, cycling and fishing are likely to increase in summer. The increase in algal blooms may affect the aesthetic value and make recreational activities less enjoyable. The prediced negative impact on fisheries has the potential to affect anglers.	Medium (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect

SEA topics and objectives		Assessment of option								
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	This option will ensure maintenance of water supplies during drought.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	The EAR states that impacts on flows in the River Nene due to the reduced MRF and consequent increase in abstraction are major to moderate in the upper reaches. Flows are lower in summer therefore the impacts of a summer drought permit on flows will be worse. It is It is not expected that the proposed drought permit would permanently affect the overall status of the River Nene at Duston Mill, although the WFD status is unlikely to achieve Good during the drought scenario modelled, regardless of the implementation of the drought permit.	Medium (negative)	Medium (negative)	Small	Medium	Short-term	Temporary	Moderate negative	No effect
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	The EAR identified major to moderate risk orthophosphate in the Nene under permit conditions. As flows are lower and temperatures higher in summer, the associated impact of water quality on environmental receptors is greater in summer months. Maintaining water levels in Pitsford Reservoir during drought periods will have an incidental benefit of reducing the risk of reduced water quality and algal blooms in the reservoir	Medium (negative) Low (positive)	Medium (negative) Medium (negative)	Small	Low	Short-term	Temporary	Moderate negative	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	No impacts identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	The EAR identified minor impacts to geomoropholgy in winter due to reductions in flow leading to reductions in sediment transport capacity in the river.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.2 To maintain and improve air quality	No construction is required and additonal emmisions associated with increased abstraction is minimal. The nearest AQMA is 1.65km away.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	There are numerous historic environment remains and features within the potential zone of influence. Key risk would be associated with a further short-term drawdown in river levels potentially affecting riverside designations (e.g. Sheduled Monuments) and buried archaeology, although this would be in the context of already low river flows due to prolonged low rainfall.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

D.13 Drought Plan Action: River Nene (Pitsford) Winter Permit

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	Objective	Indicator questions	Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary	Magnitude of effect (Low/Medium/High)	Value/ sensitivity of receptor (Low/Medium/High)	Scale of effect: geographical &/or population affected (Small/Medium/Large)	Certainty of effect (Low/Medium/High)	Duration of effect (Short-term/Medium-term/Long-term)	Permanence of effect (Permanent/ Temporary)	Residual adverse effect significance (likely to remain after reasonable mitigation)	Residual beneficial effect significance (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	·Is the option likely to affect the conservation status of any SPA/SACs, Ramsar sites, SSSIs or locally designated sites? ·Is the option likely to affect ancient woodland, BAP habitats and/or protected and BAP species? •Will the option affect any habitats that support legally protected species or species of conservation concern? ·Is there potential for contribution to achieving 'favourable' conservation status or for creation of new BAP habitats? ·Would the option protect and enhance aquatic and terrestrial habitats and species? •Will it affect WFD compliance e.g. good ecological potential/status? ·Are there any opportunities for habitat creation or restoration? •Will it protect or enhance natural capital and ecosystem services? •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?	The EAR concluded minor LSEs for the Nene Washes SAC/SPA/Ramsar/SSSI, located 11.95km downstream of the Wansford intake. Structural controls on the Nene Washes mean that the impacts of decreased flow and water levels in the River Nene (e.g. sedimentation changes and/or habitat loss) will not be replicated within the designated site. However, water quality impacts associated wih reduced dilution capacity from reduced flows are possible as pollutants discharged into the River Nene downstream of the abstraction will have a greater impact on water quality than they would do under normal, non-drought conditions and thiese flows eventually enter the Nene Washes via a sluice so the changes could be conveyed here. The hydrological impacts in winter have been assessed as moderate in the upper reaches and minor and negligible downstream. The impact would manifest as reduction in flows and wetted width which would reduce habitat availability and result in moderate impacts to fish, invertebrate, macrophyte and diatom communities. The EAR also identified moderate impacts for NERC species Spined Loach and Bullhead due to loss of important habitat and increased stress and competition. Moderate impacts ar anticipated for a number of LNRs and LWS. Impacts reduce downstream as physical environment changes lessen.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	·Does the option location affect any important fisheries (salmonid or cyprinid)? •Are there potential indirect impacts (e.g. from affecting other aspects of aquatic ecology (habitat or food species) upon which fish rely)? ·Are there opportunities to improve fish migration or could migration be impeded?	Moderate impacts to water quality (orthophosphate only) and reductions in flow and wetted width have potential to impact fish communities, posing moderate risk to the fish component of the Nene WFD water body. Moderate impacts to NERC and notable fish species such as bullhead and spined loach are possible due to loss of important habitats, increased stress and competition and increeased mortality due to increased predation. Minor impacts to European eel are anticipated.	Low (negative)	High (negative)	N/A	N/A	N/A	N/A	Slight negative	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	•Will it limit, reduce or increase the risk of spread of Invasive Non-Native Species (INNS) or occurrence of algal blooms?	Implementation of the drought permit has the potential to spread the chinese mitten crab from impacted reaches (Reaches 5 and 6) to other waterbodies. The hydrological impact in these reaches in winter is minor, therefore the impacts are considered minor in winter only.	Low (negative	Low (negative)	Small	Low	Medium-term	Permmanent	Slight negative	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value o the water environment for health and well-being	·Is there potential for health and/or quality of life to be adversely or positively affected? •Will it help to protect or improve drinking water quality? •Will it raise awareness of the importance and value of the water environment for health and well-being?	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects o a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	·Are there any pathways for effects on local businesses or other economic interests that rely on water and/or that may have licences connected to the water bodies affected? ·Are there potential adverse or positive effects on tourism? •Will it help to ensure access to a secure and affordable supply of drinking water? •Will it assist in ensuring provision of essential infrastructure services to support a sustainable economy?	Tthe likely duration of any potential impacts on other abstractors is short-term, and considered to be of minor significance.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	•Will the option impact on any formal or informal recreational areas, parks, recreational facilities, and national trails/footpaths/access? •Are there opportunities to create new/additional recreational facilities, or potential to increase amenity/ access to riverside/countryside? •Will the use of rivers or other water bodies (e.g. reservoirs) for angling, birdwatching, water sports or navigation be affected?	Water levels in the main channel are controlled by locks, tilting gates and weirs, where a minimum navigable depth of 1.8m must be maintained. During winter months when the number of boat users will be lower, the risk of the drought permit impacting navigation is low. Recreational activities such as walking, cycling and fishing are likely to increase as warm weather increases. These activities have a high visual amenity value, but the lack of significant level or water quality impacts means that visual features of the river are unlikely to be affected during the winter period. As such, the impact associated with the implementation of the drought option on winter recreation is deemed to be minor.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	••Will it help to minimise the demand for resources (including water)? •Will it minimise the use of energy and promote energy efficiency? •Will it make use of existing infrastructure? •Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? •Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	•Will it help to minimise the demand for resources (including water)? •Will it enable efficient water resource management and ensure maintenance of water supplies?	This option will ensure maintenance of water supplies during drought.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive

SEA topics and objectives		Assessment methodology	Assessment of option								
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	•Does the option take into account requirements for sustainability reductions, CAMs assessments of water availability, and the sensitivity of surface and groundwater to abstraction? Will there be a conflict with any of these requirements? •Will it enable a sustainable use of water resources that balances demand for water with environmental protection? •Will it alter the flow or level regime or residence time of surface waters or groundwaters? -Is there potential to help ameliorate low flows?	The EAR states that impacts on flows in the River Nene due to the reduced MRF and consequent increase in abstraction are moderate in the upper reaches. Flows are higher in winter therefore it is anticipated impacts of a winter permit on river flows and levels will be lower. It is not expected that the proposed drought permit would permanently affect the overall status of the River Nene at Duston Mill, although the WFD status is unlikely to achieve Good during the drought scenario modelled, regardless of the implementation of the drought permit.	Low (negative)	Medium (negative)	Small	Medium	Short-term	Temporary	Slight negative	No effect
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	-Is the option likely to affect biological or chemical quality elements? -Would the option affect flow regimes or significantly change water levels? -Is there potential for physical effects on the river channel and/or hydromorphology of watercourse(s)? -Would the option help or conflict with meeting WFD objectives for preventing deterioration and achieving good ecological status? -For Heavily Modified water bodies, would the option contribute to or prevent the implementation of mitigation measures specified in the River Basin Management Plan? •Will it affect bathing water compliance?	The EAR identified moderate risk orthophosphate in the Nene under permit conditions. Impacts are less significant in winter, as river flow, and hence the capacity for dilution, are expected to be higher. Maintaining water levels in Pitsford Reservoir during drought periods will have an incidental benefit of reducing the risk of reduced water quality and algal blooms in the reservoir	Low (negative) Low (positive)	Medium (negative) Medium (negative)	Small	Low	Short-term	Temporary	Slight negative	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	-Is there the potential to affect groundwater quality (including contamination, saline intrusion etc)? -Would the option affect groundwater flows or significantly change groundwater levels? -Could the option have any other effects that could cause deterioration in groundwater status under the WFD? -Could the option contribute to meeting WFD status objectives for any groundwater bodies?	No impacts identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	•Will it encourage efficient water use? •Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	•Will it avoid damage to and protect geologically important sites? •Will it protect and enhance the quality of soils? •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?	The EAR identified minor impacts to geomorpholgy in winter due to reductions in flow leading to reductions in sediment transport capacity in the river.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	•Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions? -Is there potential to offset energy use or contribute to renewable energy generation? •Will it reduce or minimise greenhouse gas emissions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.2 To maintain and improve air quality	•Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)? •Will it reduce or minimise air pollutant and greenhouse gas emissions?	No construction is required and additonal emmisions associated with increased abstraction is minimal. The nearest AQMA is 1.65km away.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	•Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? •Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	-Could the option affect (directly or via their setting) any historic, cultural, and archaeological sites, e.g. Scheduled Ancient Monuments, listed buildings, Registered Parks and Gardens, Conservation Areas, historic landscapes? •Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? •Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are numerous historic environment remains and features within the potential zone of influence. Key risk would be associated with a further short-term drawdown in river levels potentially affecting riverside designations (e.g. Sheduled Monuments) and buried archaeology, although this would be in the context of already low river flows due to prolonged low rainfall.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	•Will it avoid adverse effects and enhance designated landscapes? •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 improve access to valued areas of landscape character?	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

D.14 Drought Plan Action: River Nene (Rutland)

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	·Is the option likely to affect the conservation status of any SPA/SACs, Ramsar sites, SSSIs or locally designated sites? ·Is the option likely to affect ancient woodland, BAP habitats and/or protected and BAP species? •Will the option affect any habitats that support legally protected species or species of conservation concern? ·Is there potential for contribution to achieving 'favourable' conservation status or for creation of new BAP habitats? ·Would the option protect and enhance aquatic and terrestrial habitats and species? •Will it affect WFD compliance e.g. good ecological potential/status? ·Are there any opportunities for habitat creation or restoration? •Will it protect or enhance natural capital and ecosystem services? •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?	The Stage 2 Appropriate Assessment concluded that the drought permit could result in significant adverse effects on the qualifying features (spined loach and waterfowl and wader assemblage) of the Nene Washes SPA, SAC and Ramsar site due to deteriorations in water quality (particularly orthophosphate and dissolved oxygen) during summer and winter. Based on implementation of the proposed monitoring and mitigation, no adverse effects are anticipated. The EAR identified significant impacts on a number of NERC and notable fish species including; spined loach, bullhead, European eel and smelt as a result of exposure/loss of important habitats. Further significant impacts are identified for fish and macroinvertebrate communities. This results in an overall major impact on biodiversity in the River Nene.	Medium (negative)	High (negative)	Small	Medium	Short-term	Temporary	Major negative	No effect
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	·Does the option location affect any important fisheries (salmonid or cyprinid)? •Are there potential indirect impacts (e.g. from affecting other aspects of aquatic ecology (habitat or food species) upon which fish rely)? ·Are there opportunities to improve fish migration or could migration be impeded?	Major impacts to water quality (orthophosphate only) and hydrology (via reductions in flow and wetted width) have potential to significantly impact fish communities, posing major risk to the fish component of the Nene WFD water body. Significant impacts to NERC and notable fish species (spined loach, bullhead, European eel, and smelt are possible due to loss of important habitats, increased stress and competition and increased mortality due to increased predation.	Medium (negative)	High (negative)	Small	Medium	Short-term	Temporary	Major negative	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	•Will it limit, reduce or increase the risk of spread of Invasive Non-Native Species (INNS) or occurrence of algal blooms?	The EAR identified the Chinese Mitten Crab as present within the impacted reaches. It competes with local species and its burrowing nature can damage embankments and clog drainage systems. The EAR assessed the impact of increasing the risk of spread as significant as the physical environment changes as a result of the drought permit may encourage migration to other waterbodies. It	Medium (negative)	Medium (negative)	Medium	Low	Short-term	Temporary	Moderate negative	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value o the water environment for health and well-being	·Is there potential for health and/or quality of life to be adversely or positively affected? •Will it help to protect or improve drinking water quality? •Will it raise awareness of the importance and value of the water environment for health and well-being?	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects o a drought on householders by maintaining security of suppl but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	·Are there any pathways for effects on local businesses or other economic interests that rely on water and/or that may have licences connected to the water bodies affected? ·Are there potential adverse or positive effects on tourism? •Will it help to ensure access to a secure and affordable supply of drinking water? •Will it assist in ensuring provision of essential infrastructure services to support a sustainable economy?	The EAR states that there are potential impacts on other abstractors with licences (mainly for spray irrigation). The impacts associated with a drought permit are likely to be more significant than a winter permit. The vast majority of the abstractions would already have ceased before the drought permit is in place, so the impacts of the permit on these abstractors is moderate. The impact is anticipated to be more significant during summer months. The downstream reaches of the River Nene are controlled by gates and sluices to regulate flows within the Middle Level, which is important for flow regulation in summer months.	Medium (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	•Will the option impact on any formal or informal recreational areas, parks, recreational facilities, and national trails/footpaths/access? •Are there opportunities to create new/additional recreational facilities, or potential to increase amenity/ access to riverside/countryside? •Will the use of rivers or other water bodies (e.g. reservoirs) for angling, birdwatching, water sports or navigation be affected?	The Environmental Assessment states that navigation of the River Nene is not likely to be impacted by changes in water levels as a result of the Drought Permit. Water levels should be maintained in both winter and summer, meaning navigation should remain functional, although the risk of a decrease in levels is higher in summer due to increased loc usage. The risk of algal blooms could cause weed choking in summer. This could also affect the aesthetic value of the river and thus recreational activities including angling, walking and cycling. The review of the 2011/12 drought permit concluded that there were some navigational issues associated with sediment deposition in the Nene estuary; the drought permit may have contributed to these issues, but it was not possible to separate the influence of the drought permit from the underlying dry hydrological conditions that led to the need for the permit.	Medium (negative)	Medium (negative)	Small	Low	Short-term	Temporary	Moderate negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	••Will it help to minimise the demand for resources (including water)? •Will it minimise the use of energy and promote energy efficiency? •Will it make use of existing infrastructure? •Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? •Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect

SEA topics and objectives		Assessment methodology	Assessment of option								
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	•Will it help to minimise the demand for resources (including water)? •Will it enable efficient water resource management and ensure maintenance of water supplies?	This option will ensure maintenance of water supplies during drought.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	•Does the option take into account requirements for sustainability reductions, CAMs assessments of water availability, and the sensitivity of surface and groundwater to abstraction? Will there be a conflict with any of these requirements? •Will it enable a sustainable use of water resources that balances demand for water with environmental protection? •Will it alter the flow or level regime or residence time of surface waters or groundwaters? -Is there potential to help ameliorate low flows?	The EAR states that impacts on flows in the River Nene due to the reduced MRF and consequent increase in abstraction are major across both reaches, in summer and winter. It is It is not expected that the proposed drought permit would permanently affect the overall status of the River Nene at Wansford, although the WFD status is unlikely to achieve Good during the drought scenario modelled, regardless of the implementation of the drought permit.It is possible that the WFD status could deteriorate for the duration of the drought but would begin recovery as soon as non-drought conditions resumed.	Medium (negative)	Medium (negative)	Small	Medium	Short-term	Temporary	Moderate negative	No effect
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	-Is the option likely to affect biological or chemical quality elements? -Would the option affect flow regimes or significantly change water levels? -Is there potential for physical effects on the river channel and/or hydromorphology of watercourse(s)? -Would the option help or conflict with meeting WFD objectives for preventing deterioration and achieving good ecological status? -For Heavily Modified water bodies, would the option contribute to or prevent the implementation of mitigation measures specified in the River Basin Management Plan? •Will it affect bathing water compliance?	The EAR identified major risk to orthophosphate in the Nen under permit conditions. Siltation may also occur with reduced flows, further affecting water quality. Maintaining water levels in Rutland Water during drought periods will have an incidental benefit of reducing the risk of reduced water quality and algal blooms in the reservoir. However, during a drought this could be a challenge as water quality reduces as water quantity decreases.	Medium (negative) Low (positive)	Medium (negative) Medium (negative)	Small	Low	Short-term	Temporary	Moderate negative	Slight positive
Water	4.3 To protect and enhance groundwater quantity and quality	-Is there the potential to affect groundwater quality (including contamination, saline intrusion etc)? -Would the option affect groundwater flows or significantly change groundwater levels? -Could the option have any other effects that could cause deterioration in groundwater status under the WFD? -Could the option contribute to meeting WFD status objectives for any groundwater bodies?	No impacts identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	•Will it encourage efficient water use? •Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	•Will it avoid damage to and protect geologically important sites? •Will it protect and enhance the quality of soils? •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?	The EAR identified major to moderate impacts to geomorpholgy as a result of reduced flow altering the sediment transport capacity.	Medium (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	•Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions? -Is there potential to offset energy use or contribute to renewable energy generation? •Will it reduce or minimise greenhouse gas emissions?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.2 To maintain and improve air quality	•Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)? •Will it reduce or minimise air pollutant and greenhouse gas emissions?	No construction is required and additonal emmisions associated with increased abstraction is minimal.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	•Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? •Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	-Could the option affect (directly or via their setting) any historic, cultural, and archaeological sites, e.g. Scheduled Ancient Monuments, listed buildings, Registered Parks and Gardens, Conservation Areas, historic landscapes? •Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? •Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are numerous historic environment remains and features within the potential zone of influence. Key risk would be associated with a further short-term drawdown in river levels potentially affecting riverside designations (e.g. Sheduled Monuments) and buried archaeology, although this would be in the context of already low river flows due to prolonged low rainfall.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	•Will it avoid adverse effects and enhance designated landscapes? •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 improve access to valued areas of landscape character?	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

D.15 Drought Plan Action: River Trent Abstraction (Hall WTW)

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	The Environmental Assessment identified the Humber Estuary SAC, SPA, Ramsar site and SSSI as the only designated site within hydrological continuity of the abstraction point, however, it is expected that the minimal changes in flow from the Drought Permit is unlikely to affect these one or more of the sites. The Environment Agency raised concers over these sites, particularly over lamprey and the Humber estuary was subsequently screened in for features assessment. This concluded that impacts on lamprey as a result of drought permit implementation are unlikely and there is some confidence that there will be no alteration to the current passibility of Cromwell weir, however, further assessmet is recommended. It is also not anticipated that the drought permit will result in any changes to salinity, DO concentration or temperature of the River Trent. It is unlikely there will be any impacts on macroinvertebrate, macrophyte and diatom communities on the River Trent downstream of Hall WTW abstraction as the minimal and temporary reduction in flow will not impact water quality.	Low (negative)	High (negative)	Small	Medium	Short-term	Temporary	Slight negative	No effect
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	The River Trent supports salmonids, eels and lamprey, as well as brown trout and many coarse fish species. It is unlikely that attraction flows and reduced water levels in the River Trent as a result of the Drought Permit will have significant effects on salmon migration. The Drought Permit is also not expected to have an effect the flows at Cromwell weir, therefore it is likely that salmon passability will not be affected. However, without the undertaking of a full study, there is some uncertainty in this assumption. There is also unlikely to be any impacts on salmon entrainment as the screen at the abstraction point is suitable for this species. Lamprey are not likely to initiate migration in periods of low flow, in which the Drought Permit will be applied, therefore it is not expected lamprey migration will be impacted. The risk of the Drought Permit affecting lamprey spawning is expected to low as they are most likely to spawn in the middle reaches of the Trent which will not be affected by the Drought Permit. If they were to spawn in areas affected by the Permit, impacts are expected to negligible as minimal reduction in flows are predicted. It is also expected that the passability at Cromwell weir will not be affected by the Drought Permit, however there is still some uncertainty as mentioned above for Salmon. There should also not be any effects on entrainment as flows are not likely to be affected and the screen at the abstraction point is suitable for lamprey protection. The predicted temporary reduction in water levels and flows are not likely to increase pressures on European eel.	Low (negative)	High (negative)	Small	Medium	Short-term	Temporary	Slight negative	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	No impacts on INNS are identified.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects of a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

SEA topics and objectives		Assessment of option								
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	The Drought Permit could have an impact on other downstream abstractors. However, given the small of the reduction, it is considered highly unlikely that there would be any adverse impact. Two of the abstractors listed in (British Steel and Keadby power station) are so far downstream that any impact is unlikely to be measurable; the others are near Torksey where the reduction in water level would be less than at Newton but more than at Gainsborough, possibly a maximum of 1-2cm. There is no reason to expect that these abstractors would be adversely affected.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	The EAR identified that a slight reduction in water levels and flows as a result of the Drought Permit is not expected to negatively impact on water quality. Therefore, it is unlikely there will be impacts for navigation or other recreational activities.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	This option will ensure maintenance of water supplies during drought.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	The EAR identified that the abstraction has negligible impact on flows in the River Trent and does not affect the flow at North Muskham (where the HOF is defined), so continuation of abstraction when below the current HOF will have no impact on flow recovery there. Flow conditions downstream of the abstraction will revert to their nondrought permit condition as soon as the drought permit stops being used. The abstraction does reduce water levels in the vicinity of the abstraction, and for some distance upstream and downstream, but the effect is small. Sensitivty testing was undertaken as part of the EARs process, which showed that reducing the boundaries for negligible hydrological impact assessment classification did not change the overall outcome of the assessment.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	It is possible that the reduction in flow from the Drought Permit could exacerbate phosphate levels in the River Trent, which is they key water quality concern for the river. However, the reduction in flow is predicted to be minimal and temporary therefore it is not expected that the Drought Permit will have a significant effect on water quality. It also not expected the Drought Permit will result in any changes to salinity, DO concentration or temperature of the River Trent downstream of the abstraction point.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Water	4.3 To protect and enhance groundwater quantity and quality	No impacts identified	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	The EAR identified negligible impacts on geomorphology.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and Climate	6.1 To reduce greenhouse gas emissions	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect

SEA topics and objectives		Assessment of option								
Air and climate	6.2 To maintain and improve air quality	No construction is required and additonal emmisions associated with increased abstraction is minimal.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	There are numerous historic environment remains and features within the potential zone of influence. Key risk would be associated with a further short-term drawdown in river levels potentially affecting riverside designations (e.g. Sheduled Monuments) and buried archaeology, although this would be in the context of already low river flows due to prolonged low rainfall.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

D.16 Drought Plan Action: Wellington Wellfield (summer)

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	There are a number of designated sites within the zone of influence (ZoI) of the drought permit. Examples (including distance from boreholes) include; Breckland SAC (7.7km), Foulden Common SSSI (7.4km), Didlington Park Lakes SSSI (4.2 km), Norfolk Valley SAC (7.4km). The majority of sites in the ZoI have been assessed as neglible (uncertain) for summer with the exception of Didlington Park Lakes SSSI which has been assessed as moderate due to a reduction in groundwater levels which may result in the lakes not being able to replenish and may result in the loss of available habitats for aquatic plant species and breeding/overwintering opportunities for the many bird species. Impacts on GWDTE across the designated sites have been assessed as negligible (uncertain) to moderate in summer and winter. The duration of possible effects is unknown. This has uncertain impacts on a number of wetland bird species as the reduction in groundwater levels may result in loss/reduction of the supporting habitat. NVC surveys should be undertaken pre/during and post permit implementation to record any changes to wetland habitats within the ZoI which may be as a result of the abstraction.	Low (negative)	High (negative)	Medium	Low	Unknown	Temporary/Permanent	Moderate negative	No effect
Biodiversity, flora and fauna	1.2 To maintain and where possible improve freshwater fisheries	No impacts on fisheries have been identified for the River Wissey and Little Ouse as flow, river levels and water quality changes as a result of the drought permit are expected to be negligible.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	15 invasive plant species (terrestrial and aquatic) were identified within the 13km ZoI of the borehole locations. The drought permit may cause a reduction in groundwater levels of varying severity across the ZoI. The reduction in water may result in opportunistic INNS communities to thrive due to the die back of flora. The impact has been assessed as uncertain in the EAR due to the uncertainty surrounding the duration of groundwater abstraction INNS surveys should be undertaken pre/during and post implementation of the drought permit to reduce this uncertainty. Impact assessed as slight negative due to the uncertainty however this could be reduced to negligible if appropriate mitigation implemented.	Uncertain	Low (negative)	Medium	Low	Unknown	Temporary/Permanent	Slight negative	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value of the water environment for health and well-being	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects of a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	There are a number of groundwater licences within a 10km radius of the abstraction locations. These include abstractions for spray irrigation, general farming and industrial purposes. Further details on individual licences and their infrastructure is required to provide a full assessment, however, based on modelled groundwater impacts, it is anticipated the impact on other non-PWS abstractions is minor to moderate. The impact on surface water abstractions is considered to be negligible.	Medium (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect

SEA topics and objectives		Assessment of option								
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	The River Wissey is navigable for 11.2 miles from the confluence with the River Great Ouse to Whittington, whilst the River Little Ouse is navigable for 13.7 miles from the confluence with the River Great Ouse to Brandon. Coarse fishing is common on both the River Little Ouse and the River Wissey, whilst the River Wissey also supports game fishing and is known to be restocked with brown trout. The mechanisms through which navigation would be impacted (changes in flows or river levels) are not perceived to change and so the impacts of the drought permit on navigation is considered negligible. As water quality is not perceived to deteriorate as a result of the drought permit and flows are unlikely to decrease, algal blooms are also considered unlikely. Therefore, angling or other recreational activity is not anticipated to be impacted in the Wissey or the Little Ouse in either summer or winter.	Low (negative)	Low (negative)	Medium	Low	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	This option will ensure maintenance of water supplies during drought.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	It is anticipated that the Drought Permit's impact on flows or levels in the River Wissey and River Little Ouse is negligible. Additional pumping at Wellington Wellfield will result in additional drawdown in the groundwater body.	Low (negative)	Medium (negative)	Small	Medium	Short-term	Temporary	Slight negative	No effect
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	It is anticipated that the impact of the Drought Permit on surface water flows is negligible, therefore potential impacts on water quality is expected to be negligible.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Water	4.3 To protect and enhance groundwater quantity and quality	No impacts on groundwater quality are anticipated. Impacts on hydrogeology have been assessed as minor to moderate in the EAR as a result of increased abstraction, however the duration of impacts remains uncertain. The broad pattern of winter operation compared with summer operation is similar, but drawdowns are marginally lower in winter periods.	Medium (negative)	Medium (negative)	Small	Low	Uncertain	Temporary	Moderate negative	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	The EAR identified minor impacts to geomoropholgy when the drought permit is implemented in winter due to the increased flows in winter offsetting any potential impacts as a result of minor flow reductions.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect

SEA topics and objectives		Assessment of option								
Air and Climate	6.1 To reduce greenhouse gas emissions	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activities are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.2 To maintain and improve air quality	No construction is required and additonal emmisions associated with increased abstraction is minimal.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	There are numerous historic environment remains and features within the potential zone of influence. There is considered to be negligible impact on those alongside the rivers Wissey and Little Ouse as no impacts on surface waters have been identified. Slight risk associated with the drawdown in groundwater levels potentially affecting nearby Scheduled Monuments and listed buildings, although this would be in the context of already low groundwater levels due to prolonged low rainfall.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

D.17 Drought Plan Action: Wellington Wellfield (winter)

SEA topics and objectives		Assessment methodology	Assessment of option								
Topic	**Objective**	**Indicator questions**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Magnitude of effect (Low/Medium/High)**	**Value/ sensitivity of receptor (Low/Medium/High)**	**Scale of effect: geographical &/or population affected (Small/Medium/Large)**	**Certainty of effect (Low/Medium/High)**	**Duration of effect (Short-term/Medium-term/Long-term)**	**Permanence of effect (Permanent/ Temporary)**	**Residual adverse effect significance** (likely to remain after reasonable mitigation)	**Residual beneficial effect significance** (likely to remain after reasonable mitigation)
Biodiversity, flora and fauna	1.1 To protect and where feasible enhance biodiversity including designated and other important habitats and species and to conserve and enhance natural capital and ecosystem services	Is the option likely to affect the conservation status of any SPA/SACs, Ramsar sites, SSSIs or locally designated sites? · Is the option likely to affect ancient woodland, BAP habitats and/or protected and BAP species? •Will the option affect any habitats that support legally protected species or species of conservation concern? · Is there potential for contribution to achieving 'favourable' conservation status or for creation of new BAP habitats? ·Would the option protect and enhance aquatic and terrestrial habitats and species? •Will it affect WFD compliance e.g. good ecological potential/status? ·Are there any opportunities for habitat creation or restoration? •Will it protect or enhance natural capital and ecosystem services? •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?	There are a number of designated sites within the zone of influence (ZoI) of the drought permit. Examples (including distance from boreholes) include; Breckland SAC (7.7km), Foulden Common SSSI (7.4km), Didlington Park Lakes SSSI (4.2 km), Norfolk Valley SAC (7.4km). The majority of sites in the ZoI have been assessed as neglible (uncertain) for winter with the exception of Didlington Park Lakes SSSI and Breckland SAC which have been assessed as moderate. Minor impacts for on Foulden Common SSSI and Weeting Heath SSSI/NNR. Moderate impacts are as a result of a reduction in groundwater levels (when they are already fairly low in winter) which may result in the lakes not being able to replenish and may result in the loss of available habitats for aquatic plant species, great crested newt and a number of wetland bird species. A Stage 2 Appropriate Assessment as undertaken for Breckland SAC which concluded tha there is uncertainty around the impacts of prolongued drought permit implementation, however, no adverse effects on the groundwater dependent qualifying features are anticipated if proposed mitigation measures are implemented. Impacts on GWDTE across the designated sites have been assessed as negligible (uncertain) to moderate in summer and winter. The duration of possible effects is unknown. This has uncertain impacts on a number of wetland bird species as the reduction in groundwater levels may result in loss/reduction of the supporting habitat. NVC surveys should be undertaken pre/during and post permit implementation to record any changes to wetland habitats within the ZoI which may be as a result of the abstraction.	Low (negative)	High (negative)	Medium	Low	Unknown	Temporary/Perman ent	Moderate negative	No effect
Biodiversity, flora and fauna	1.2To maintain and where possible improve •Are there potential indirect impacts (e.g. from affecting other aspects of aquatic freshwater fisheries ecology (habitat or food species) upon which fish rely)?	·Does the option location affect any important fisheries (salmonid or cyprinid)? ·Are there opportunities to improve fish migration or could migration be impeded?	No impacts on fisheries have been identified for the River Wissey and Little Ouse as flow, river levels and water quality changes as a result of the drought permit are expected to be negligible.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Biodiversity, flora and fauna	1.3 To avoid introducing or spreading INNS.	•Will it limit, reduce or increase the risk of spread of Invasive Non-Native Species (INNS) or occurrence of algal blooms?	15 invasive plant species (terrestrial and aquatic) were identified within the 13km ZoI of the borehole locations. The drought permit may cause a reduction in groundwater levels of varying severity across the ZoI. The reduction in water may result in opportunistic INNS communities to thrive due to the die back of flora. The impact has been assessed as uncertain in the EAR due to the uncertainty surrounding the duration of groundwater abstraction INNS surveys should be undertaken pre/during and post implementation of the drought permit to reduce this uncertainty. Impact assessed as slight negative due to the uncertainty however this could be reduced to negligible if appropriate mitigation implemented.	Uncertain	Low (negative)	Medium	Low	Unknown	porary/Permanent	Slight negative	No effect
Population and human health	2.1 To protect and enhance health and well-being, especially for the most vulnerable, and raise awareness of the importance and value o the water environment for health and well- being	·Is there potential for health and/or quality of life to be adversely or positively affected? •Will it help to protect or improve drinking water quality? •Will it raise awareness of the importance and value of the water environment for health and well-being?	No impacts on communities and households are anticipated as a result of the option. No physical works are required. The option aims to reduce the effects of a drought on householders by maintaining security of supply but would not reduce the need for restrictions on household / domestic use.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Population and human health	2.2 To minimise impacts on business and local economy and ensure good access to essential services, including a secure and affordable supply of water	· Are there any pathways for effects on local businesses or other economic interests that rely on water and/or that may have licences connected to the water bodies affected? ·Are there potential adverse or positive effects on tourism? •Will it help to ensure access to a secure and affordable supply of drinking water? •Will it assist in ensuring provision of essential infrastructure services to support a sustainable economy?	There are a number of groundwater licences within a 10km radius of the abstraction locations. These include abstractions for spray irrigation, general farming and industrial purposes. Further details on individual licences and their infrastructure is required to provide a full assessment, however, based on modelled groundwater impacts, it is anticipated the impact on other non-PWS abstractions is minor to moderate. The impact on surface water abstractions is considered to be negligible. The River Wissey is navigable for 11.2 miles from the confluence with the River Great Ouse to Whittington, whilst the River Little Ouse is navigable for 13.7 miles from the confluence with the River Great Ouse to Brandon. Coarse fishing is common on both the River Little Ouse and the River Wissey, whilst the River Wissey also supports game fishing and is known to be restocked with brown trout. The mechanisms through which navigation would be impacted (changes in flows or river levels) are not perceived to change and so the impacts of the drought permit on navigation is considered negligible.	Medium (negative)	Low (negative)	Small	Low	Short-term	Temporary	Slight negative	No effect
Population and human health	2.3 Protect and, where possible, enhance recreation and amenity facilities and increase access and enjoyment of the countryside and water environment	•Will the option impact on any formal or informal recreational areas, parks, recreational facilities, and national trails/footpaths/access? •Are there opportunities to create new/additional recreational facilities, or potential to increase amenity/ access to riverside/countryside?		Low (negative)	Low (negative)	Medium	Low	Short-term	Temporary	Negligible negative	No effect

SEA topics and objectives		Assessment methodology	Assessment of option							
		•Will the use of rivers or other water bodies (e.g. reservoirs) for angling, birdwatching, water sports or navigation be affected?	As water quality is not perceived to deteriorate as a result of the drought permit and flows are unlikely to decrease, algal blooms are also considered unlikely. Therefore, angling or other recreational activity is not anticipated to be impacted in the Wissey or the Little Ouse in either summer or winter.							
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.	••Will it help to minimise the demand for resources (including water)? •Will it minimise the use of energy and promote energy efficiency? •Will it make use of existing infrastructure? •Will it help to encourage sustainable design or use of sustainable materials (e.g. supplied from local resources)? •Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling?	Increases in abstraction over and above what occurs under normal operation will usually result in related and proportional increases in energy use and waste. No construction is required for this option and existing infrastrucutre will be utilised.	Low (negative)	Low (negative)	Small	Medium	Short-term	Temporary	Negligible negative	No effect
Material assets and resource use	3.2 To promote the sustainable management of natural resources including efficient water resource management and to ensure water supply for homes and industry in the area is maintained.	•Will it help to minimise the demand for resources (including water)? •Will it enable efficient water resource management and ensure maintenance of water supplies?	This option will ensure maintenance of water supplies during drought.	Low (positive)	Medium (positive)	Medium	High	Short to Medium-term	Temporary	No effect	Slight positive
Water	4.1 To protect and where possible enhance river flows and groundwater resources, including when this impacts on habitats and/or navigation, and ensure sustainable management of abstractions or compensation flow),to maintain water supplies whilst protecting ecosystem functions that rely on water resources	•Does the option take into account requirements for sustainability reductions, CAMs assessments of water availability, and the sensitivity of surface and groundwater to abstraction? Will there be a conflict with any of these requirements? •Will it enable a sustainable use of water resources that balances demand for water with environmental protection? •Will it alter the flow or level regime or residence time of surface waters or groundwaters? ·Is there potential to help ameliorate low flows?	It is anticipated that the Drought Permit's impact on flows or levels in the River Wissey and River Little Ouse is negligible. Additional pumping at Wellington Wellfield will result in additional drawdown in the groundwater body.	Low (negative)	Medium (negative)	Small	Medium	Short-term	Temporary	Slight negative	No effect
Water	4.2 To protect and where feasible enhance the quality of surface, transitional and coastal waters	·Is the option likely to affect biological or chemical quality elements? ·Would the option affect flow regimes or significantly change water levels? · Is there potential for physical effects on the river channel and/or hydromorphology of watercourse(s)? · Would the option help or conflict with meeting WFD objectives for preventing deterioration and achieving good ecological status? · For Heavily Modified water bodies, would the option contribute to or prevent the implementation of mitigation measures specified in the River Basin Management Plan? •Will it affect bathing water compliance?	It is anticipated that the impact of the Drought Permit on surface water flows is negligible, therefore potential impacts on water quality is expected to be negligible.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Water	4.3 To protect and enhance groundwater quantity and quality	· Is there the potential to affect groundwater quality (including contamination, saline intrusion etc)? · Would the option affect groundwater flows or significantly change groundwater levels? · Could the option have any other effects that could cause deterioration in groundwater status under the WFD? ·Could the option contribute to meeting WFD status objectives for any groundwater bodies?	No impacts on groundwater quality are anticipated. Impacts on hydrogeology have been assessed as minor to moderate in the EAR as a result of increased abstraction, however the duration of impacts remains uncertain. The broad pattern of winter operation compared with summer operation is similar, but drawdowns are marginally lower in winter periods.	Medium (negative)	Medium (negative)	**S**mall	Low	Uncertain	Temporary	Moderate negative	No effect
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	•Will it encourage efficient water use? •Will it contribute towards improving the awareness of water sustainability and its true value?	No opportunities to promote long-term improvement in water efficiency have been identified for this option.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect
Soil, geology and land use	5.1 To protect and enhance geology, the quality and quantity of soils and geodiversity and promote a catchment-wide approach to land management.	•Will it avoid damage to and protect geologically important sites? •Will it protect and enhance the quality of soils? •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?	The EAR identified minor impacts to geomoropholgy when the drought permit is implemented in winter due to the increased flows in winter offsetting any potential impacts as a result of minor flow reductions.	Low (negative)	Low (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Air and Climate	6.1 Toeduce greenhouse gas emissions	•Will it result in an increase in greenhouse gas emissions over and above that that would be produced to supply an equivalent quantity of water in non-drought conditions? ·Is there potential to offset energy use or contribute to renewable energy generation?	Short-term increases in greenhouse gas emissions will occur due to increased abstraction. However, no construction activitie are required for this option, and the use of existing infrastructure and treatment facilities will minimise increases in greenhouse gas emissions.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect

SEA topics and objectives		Assessment methodology	Assessment of option								
		•Will it reduce or minimise greenhouse gas emissions?									
Air and climate	6.2 To maintain and improve air quality	•Will it increase emissions to air in an areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)? •Will it reduce or minimise air pollutant and greenhouse gas emissions?	No construction is required and additonal emmisions associated with increased abstraction is minimal.	Low (negative)	Low (negative)	Small	High	Short-term	Temporary	Negligible negative	No effect
Air and climate	6.3 To consider the need for adaptive measures for climate change	•Will it reduce vulnerability to risks associated with climate change effects (e.g. reduce the adverse effects of droughts and floods)? •Will it improve resilience/adaptability to likely effects of climate change, e.g. by increasing water storage capacity, or transferring water from areas with surplus?	Drought permits/orders are a key component of Anglian Water's Drought Plan. The Plan aims to ensure resilience of water supplies to drought.	Low (beneficial)	High	Small	Moderate	Long-term	Temporary	No effect	Slight positive
Archaeology and Cultural Heritage	7.1 To protect and where feasible enhance sites and features of archaeological, historic, and architectural interest, and their settings.	. Could the option affect (directly or via their setting) any historic, cultural, and archaeological sites, e.g. Scheduled Ancient Monuments, listed buildings, Registered Parks and Gardens, Conservation Areas, historic landscapes? •Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? •Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?	There are numerous historic environment remains and features within the potential zone of influence. There is considered to be negligible impact on those alongside the rivers Wissey and Little Ouse as no impacts on surface waters have been identified. Slight risk associated with the drawdown in groundwater levels potentially affecting nearby Scheduled Monuments and listed buildings, although this would be in the context of already low groundwater levels due to prolonged low rainfall.	Low (negative)	High (negative)	Small	Low	Short-term	Temporary	Negligible negative	No effect
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	•Will it avoid adverse effects and enhance designated landscapes? •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 improve access to valued areas of landscape character?	No construction activities are required for this option. The option is not located in proximity to any designated landscapes.	N/A	N/A	N/A	N/A	N/A	N/A	No effect	No effect

E Quality Assurance

ODPM Guidance[87] on SEA contains a Quality Assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in **Table E.1** indicating where this Environmental Report meets the requirements.

Table E.1 Quality Assurance Checklist

Checklist item	Comments
Objectives and context	
The plan's or programme's purpose and objectives are made clear.	The purpose of the Drought Plan 2022 is set out in Sections 1.1-1.4.
Environmental issues and constraints, including international and EC environmental protection objectives, are considered in developing objectives and targets.	Objectives of other relevant plans and programmes are set out in Section 2.2 and Appendix A.
SEA objectives, where used, are clearly set out and linked to indicators and targets where appropriate.	Objectives are set out in Section 4.2.
Links with other related plans, programmes and policies are identified and explained.	Links are identified in Section 2.2 and Appendix A.
Conflicts that exist between SEA objectives, between SEA and plan objectives and between SEA objectives and other plan objectives are identified and described.	Cumulative effects such as those associated with the DP 2022 and other plans are addressed in Section 6.
Scoping	
Consultation Bodies are consulted in appropriate ways and at appropriate times on the content and scope of the Environmental Report.	This Scoping Report is a part of the consultation process required to meet the requirements of the SEA Directive and has been circulated to consultees. Further consultation will be undertaken on the Environmental Report and Drought Plan 2022. The consultation process is described in Section 1.8.
The assessment focuses on significant issues.	The scope of the assessment reflects the geographic extent of Anglian Water's water supply area, and provides a comprehensive approach to assessment (reflecting the large number of interactions dependent on the continued supply of water) which will enable the subsequent assessment to determine which impacts will be considered significant.
Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.	Difficulties and assumptions are set out in Sections 1.2, 3.2 and 4.4.

[87] Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive.

Checklist item	Comments
Reasons are given for eliminating issues from further consideration.	The proposed SEA objectives provide a comprehensive basis for assessment and no issues were eliminated at the Scoping stage.
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.	The appraisal framework has been used to assess the drought options.
Alternatives include 'do minimum' and/or 'business as usual' scenarios wherever relevant.	Assessment of alternatives (the drought options) have been considered in the Environmental Report.
The environmental effects (both adverse and beneficial) of each alternative are identified and compared.	Assessment of alternatives (the drought options) have been considered in the Environmental Report.
Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained.	Assessment of alternatives (the drought options) have been considered in the Environmental Report.
Reasons are given for selection or elimination of alternatives.	Assessment of alternatives (the drought options) have been considered in the Environmental Report.
Baseline information	
Relevant aspects of the current state of the environment and their likely evolution without the plan or programme are described.	The current state of the environment and predicted future baseline is set out in Section 3 and Appendix B for each SEA topic.
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 Anglian Water's water supply area, and bordering regions where appropriate, are described in Section 1.3.
Difficulties such as deficiencies in information or methods are explained.	Difficulties and limitations are set out in Section 3.2 (and Section 4.4 for the wider methodology).
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.	Potential effects have been set out in Section 5, Section 6 and Appendix D.
Both positive and negative effects are considered, and the duration of effects (short, medium or long-term) is addressed.	The nature and duration of potential effects have been set out in the Environmental Report, using an appraisal framework set out in Section 4. Effects are assessed in Sections 5 and 6 and Appendix D.
Likely secondary, cumulative and synergistic effects are identified where practicable.	These effects have been identified in Section 6.

Checklist item	Comments
Inter-relationships between effects are considered where practicable.	These effects have been considered within the assessment in Section 5 and Appendix D and also in Section 6 of this Environmental Report where practicable.
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 in the Environmental Report.
Methods used to evaluate the effects are described.	The Environmental Report includes information on the methods used for evaluation of potential effects in Section 4.
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 have been incorporated into the assessment undertaken in preparing the Environmental Report, and are described in Section 7.2.
Issues to be taken into account in project consents are identified.	Such mitigating measures, if required, will be highlighted against the drought options. It is noted that Environmental Reports which include Environmental Management Plans have been prepared for most of the Drought Permit sites (see Section 1.5).
The Environmental Report	
Is clear and concise in its layout and presentation.	The Environmental Report is clear and concise. See Sections 1.6 and 1.7.
Uses simple, clear language and avoids or explains technical terms.	The Environmental Report uses simple, clear language, and explains technical terms, as appropriate.
Uses maps and other illustrations where appropriate.	The Environmental Report has used maps and illustrations where appropriate.
Explains the methodology used.	SEA methodology has been described in Sections 1.6 and 4.
Explains who was consulted and what methods of consultation were used.	The consultation strategy, including organisations and dates of consultation is included in Section 1.8.
Identifies sources of information, including expert judgement and matters of opinion.	Sources of information have been detailed in various sections of the Environmental 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.	The Environmental Report includes a Non-Technical Summary.
Consultation	
The SEA is consulted on as an integral part of the plan-making process.	The Scoping Report and Environmental Report are part of the consultation process required to meet the requirements of the SEA Directive. Both have been circulated to consultees.

Checklist item	Comments
	The consultation process is described in Section 1.8.
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.	The Scoping Report and Environmental Report are part of the consultation process required to meet the requirements of the SEA Directive. Both have been circulated to consultees. The consultation process is described in Section 1.8.
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.	Consultation responses from the Scoping stage have been incorporated into the Environmental Report. Responses from consultation on the draft Environmental Report will be incorporated in the development of the final Environmental Report. After finalisation of the Drought Plan, a statement will be published describing how the SEA and the responses to consultation have been taken into account during the preparation of the Drought Plan. The consultation process is described in Section 1.8.
An explanation is given of how they have been taken into account.	Consultation responses from the Scoping stage have been incorporated into the Environmental Report. Responses from consultation on the draft Environmental Report will be incorporated in the development of the final Environmental Report. After finalisation of the DP, a statement will be published describing how the SEA and the responses to consultation have been taken into account during the preparation of the DP. The consultation process is described in Section 1.8.
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered.	This will be set out in the Final DP following consultation on the Draft Drought Plan 2022 and Environmental Report.
Monitoring measures	
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA.	Section 7.3 provides an overview of proposals for monitoring.
Monitoring is used, where appropriate, during implementation of the plan or programme to make good deficiencies in baseline information in the SEA.	Suggestions for monitoring are made in Section 7.3, with monitoring taking place following implementation of the Drought Plan, further to consultation with regulatory authorities including the Environment Agency and Natural England.

Checklist item	Comments
Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects may include predictions which prove to be incorrect.)	Suggestions for monitoring are made in Section 7.3, with monitoring taking place following implementation of the Drought Plan, further to consultation with regulatory authorities including the Environment Agency and Natural England.
Proposals are made for action in response to significant adverse effects.	Mitigation measures for adverse effects are suggested in Section 7.2.

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