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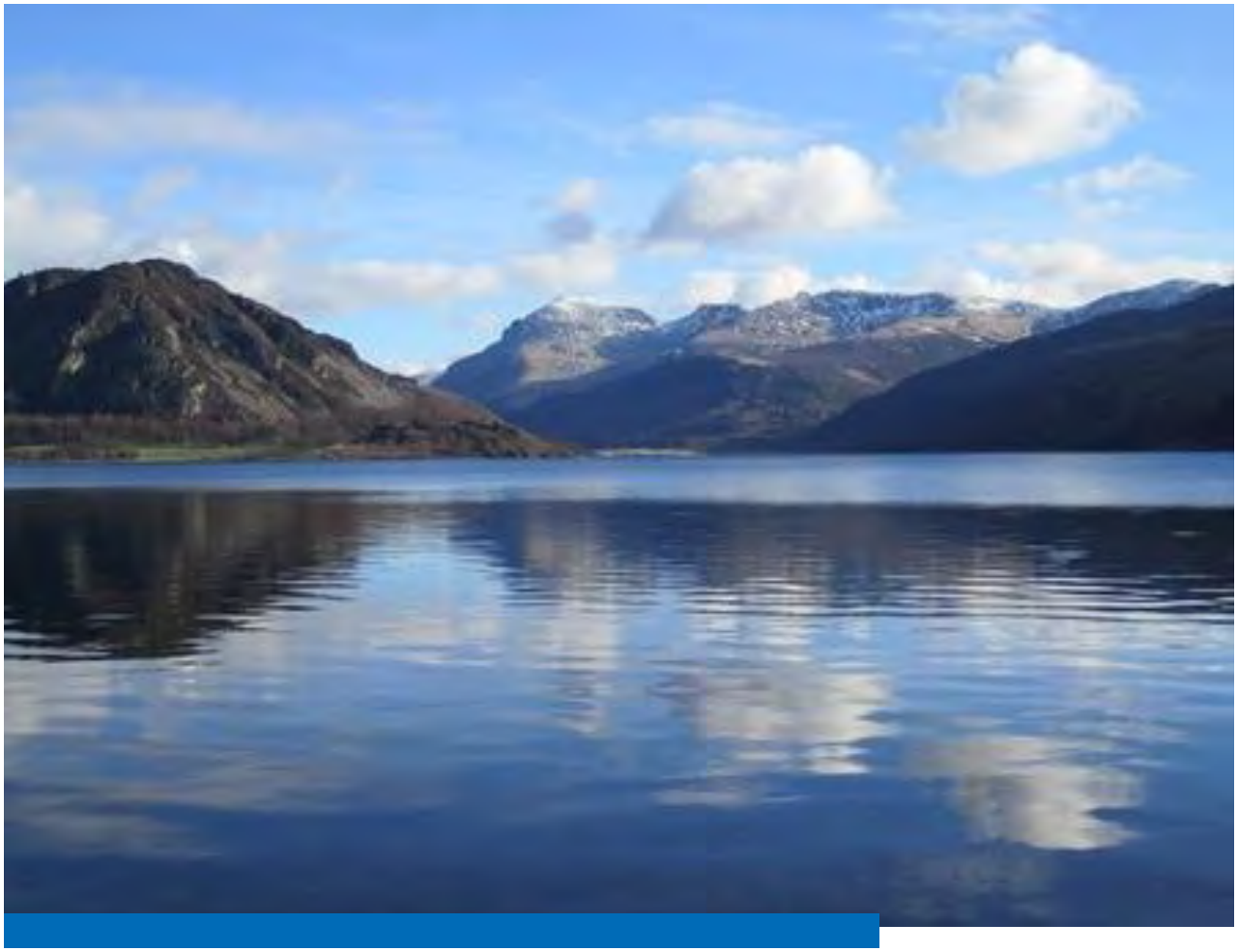

Strategic Environmental Assessment of United Utilities' Revised Draft Drought Plan 2022

Report for United Utilities

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Executive summary

Introduction

Under the Water Act 2014, United Utilities (UU) is required to prepare and update a Drought Plan every five years. United Utilities (UU) published their current statutory Final Drought Plan in June 2018, with minor amendments made in August 2019 to incorporate lessons learned during the dry weather in 2018. UU are now preparing the Revised Draft Drought Plan 2022 which will encompass the period 2022-2027. It has been determined that Strategic Environmental Assessment (SEA) and a Habitats Regulations Assessment (HRA) are required.

The Drought Plan provides a comprehensive statement of the actions UU will consider implementing during drought conditions to safeguard essential water supplies to customers and minimise environmental impact. It is consistent with UU's Water Resources Management Plan (WRMP), the objective of which is to set the strategic plan for the delivery of adequate water resources over a 25 year period.

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 bespoke reaction in terms of measures. In the context of drought planning, individual drought options are taken to constitute alternatives. UU's Revised Draft Drought Plan 2022 comprises a total of 21 drought options (one supply side option, six demand options and 14 drought permit sites).

SEA of plans and programmes is a statutory requirement under the Environmental Assessment of Plans and Programmes Regulations 2004. The purpose of SEA is to provide high level and strategic protection of the environment by incorporating environmental considerations into the preparation of plans and policy. In the context of drought planning, SEA assists in the identification of the likely significant environmental effects of UU's drought options and determines how any adverse impacts might be mitigated.

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 and implementation of drought options within the Drought Plan.

SEA Screening confirmed that UU's Revised Draft Drought Plan 2022 required both SEA and HRA. The HRA of UU's Revised Draft Drought Plan 2022 has been undertaken in parallel with the SEA and is reported separately in the HRA Screening Report. The HRA screening process identifies whether each drought option in the drought plan (either alone, in combination or with other plans or projects) is likely to have significant effects on European designated sites, i.e. sites of international conservation importance. The findings of both the SEA and HRA have fed into the revision of the Drought Plan in an iterative process.

The findings of the SEA are presented within this Environmental Report, which accompanies UU's submission of the Revised Draft Drought Plan 2022 to Defra and the Welsh Government and has been subject to public consultation.

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; 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.

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 (both intra- and inter- water resource zone) and in combination with the implementation of other relevant plans and programmes.

Findings of the Assessments

The findings of the SEA of each drought option is set out in **Table 1** and is summarised below.

Supply side options

Minor construction works are required to allow access to Castle Carrock deadwater and few residual environmental effects are anticipated. Operationally, the supply side option is within existing licensed abstraction limits and it is assumed that the existing abstraction licence would not have been granted if these options resulted in unsustainable abstraction. Overall, most of the impacts of implementing this option are anticipated to be negligible or minor adverse, with minor beneficial impacts associated with benefits to security of public water supply and climate change adaptation.

Demand side options

Demand side measures serve to reduce pressure on water resources by reducing customer demand for water, and therefore reducing the abstraction at source. This will in turn contribute to reducing the amount of energy needed for water abstraction, treatment and distribution. Overall, impacts for these drought options are considered to be negligible to major beneficial. Adverse impacts on population and human health were associated with options involving water use restrictions.

Drought permit options

The magnitude of impacts on SEA objectives for drought permit options (i.e. where there is modification to the conditions of an existing abstraction licence) varies between and within the options, ranging from major beneficial for the SEA objective for population and human health, to minor adverse for the SEA objective for biodiversity, flora and fauna. The latter were associated with adverse changes to surface water levels and flows.

Cumulative Impacts

The cumulative, or in-combination, assessment identified the potential for adverse impacts if two drought options were to be implemented at the same time, either intra- or inter- water resource zone. In the majority of combinations, no impacts are considered likely, however, in some cases, impacts have been identified where, for example, both options draw on the same water resource (e.g. same groundwater catchment or same river). Due to the uncertainty of timing of implementation of drought options, assessments of each drought option with each other drought option have been undertaken with the intention that in the event of a drought, the findings of the SEA 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.

Assessment of UU's Revised Draft Drought Plan 2022 with other plans and programmes, including UU's WRMP, Environment Agency / Natural Resources Wales Drought Plans, other water company Drought Plans and National Policy Statements, concluded that no significant cumulative, or in-combination, effects are anticipated.

Table 1: Visual evaluation matrix summary for Revised Draft Drought Plan 2022 options

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 and Visual Amenity	Inter-relationships	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	9.1	
SUPPLY SIDE OPTIONS																						
Strategic Resource Zone																						
None																						
Carlisle Resource Zone																						
Castle Carrock Reservoir, dead water storage	Adverse											None			None			None				The implementation of this drought option would result in a minor adverse impacts on biodiversity and population and human health, due to potential impacts on fish populations and resulting impacts on angling. There are also anticipated to be temporary minor adverse impacts on river flows and water quality. Reservoir drawdown and exposure of shoreline margins may result in minor adverse impacts to soil, geology and land use. The impact of the drought option on landscape and visual amenity is considered to be moderate adverse but temporary. Impacts to inter-relationships between topics have been summarised as moderate adverse.
	Beneficial	None	None		None		None	None	None	None		None			None	None	None		None	None		Overall three minor beneficial effects were identified. These were in relation to population and human health based on continued supply of drinking water and a beneficial impact on adaptation to climate change. The remaining impacts on water, soil and geology, and inter-relationships would be negligible.
North Eden Resource Zone																						
None																						
DEMAND SIDE OPTIONS																						
Drought Publicity	Adverse	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	Overall negligible adverse effects have been identified relating to topics including Biodiversity, Flora and Fauna, Population and Human Health, Material Assets and Resource Use, Water, and Landscape and Visual Amenity, and Inter-relationships.
	Beneficial		None		None					None			None	None	None	None	None		None			Minor beneficial effects have been identified relating to Population and Human Health, Material Assets and Resource Use, Water and Air and Climate. The effect on inter-relationships was also assessed to be minor beneficial.
Enhanced leakage detection and repair	Adverse		None		None	None		None	None	None	None	None			None			None				Negligible adverse effects have been identified for the topics of Biodiversity, Population and Human Health, Material Assets and Resources, Soil, Geology and Land Use, Air and Climate, Landscape and Visual Amenity and Inter-relationships. These impacts are largely anticipated to be temporary and in relation to construction.
	Beneficial		None		None		None			None			None	None	None				None			Minor beneficial effects have been identified for the topics of Population and Human Health, Material Assets and Resource Use Water, and Air and Climate. The effects upon inter-relationships are assessed to be minor beneficial.
Campaign for voluntary water use restraint	Adverse	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	Overall negligible adverse effects have been identified relating to topics including Biodiversity, Flora and Fauna, Population and Human Health, Material Assets and Resource Use, Water, and Landscape and Visual Amenity, and Inter-relationships.
	Beneficial		None		None					None			None	None	None	None	None		None			Minor beneficial effects have been identified for the topics of Population and Human Health, Material Assets and Resource Use Water, and Air and Climate. The effects upon inter-relationships are assessed to be minor beneficial.
	Adverse	None	None				None		None	None	None	None	None	None	None	None	None	None	None	None	None	Minor adverse effects are anticipated on Population and Human Health as a result of impacts to informal recreation, domestic customers and certain business sectors.

Temporary Use Ban (TUB)																						
	Beneficial		None		None	None				None			None	None	None	None	None		None			Minor beneficial effects have been identified for the topics of Population and Human Health, Material Assets and Resource Use Water, and Air and Climate. The effects upon inter-relationships are assessed to be minor beneficial.
Ordinary Drought Order (Non-Essential Use Ban)	Adverse	None	None				None	None	None	None		None	None	None	None	None	None	None	None			Minor to moderate adverse effects are anticipated on Population and Human Health as a result of impacts to informal recreation, domestic customers and certain business sectors.
	Beneficial		None		None	None				None			None	None	None	None	None		None			Minor to moderate beneficial effects have been identified for the topics of Population and Human Health, Material Assets and Resource Use Water, and Air and Climate. The effects upon inter-relationships are assessed to be minor beneficial.
Pressure manage-ment	Adverse	None	None		None		None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	Minor adverse impacts are anticipated to Population and Human Health as a result of the impact pressure management would have upon water-dependent businesses.
	Beneficial		None		None					None		None	None	None	None	None			None			Overall moderate beneficial effects are anticipated to Population and Human Health, Material Assets and Resource Use, Water and Air and Climate. The effects upon Inter-relationships are assessed to be minor beneficial.
DROUGHT PERMIT OPTIONS																						
Strategic Resource Zone																						
Delph Reservoir	Adverse					None	None	None				None		None	None	None	None	None				Overall, minor adverse effects were identified relating to the impact of riverine flow reduction on biodiversity, water quality, fluvial geomorphology and landscape and visual amenity. The impact of inter-relationships has been assessed as minor.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None	None		None		None	Minor beneficial effects were identified relating to population and human health based on continued supply of drinking water and benefits associated with the landscape amenity of the reservoir. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Dovestone Reservoir 10 Ml/d	Adverse					None	None	None				None		None	None	None	None	None				Minor adverse effects were identified relating to the impact of river flow reduction on biodiversity, water quality, fluvial geomorphology and landscape and visual amenity. The effect on Inter-relationships has been assessed as minor.
	Beneficial	None	None		None					None	None	None	None	None	None	None	None	None		None	None		Overall minor beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Dovestone Reservoir 5 Ml/d	Adverse					None	None	None				None		None	None	None	None	None				Minor adverse effects were identified relating to the impact of river flow reduction on biodiversity, water quality, fluvial geomorphology and landscape and visual amenity. The effect on Inter-relationships has been assessed as minor.
	Beneficial	None	None		None					None	None	None	None	None	None	None	None	None		None	None		Overall moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. As the drought permit will slow the rate of drawdown, it is also predicted to have a small positive effect on reservoir water level and exposure. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Fernilee Reservoir	Adverse			None		None	None					None		None	None	None	None	None				Minor adverse effects are anticipated to biodiversity, water flow and levels and fluvial geomorphology. The effect on Inter-relationships has also been assessed as minor.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None	None		None	None		Overall, minor beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies

																					to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Jumbles Reservoir 12 Ml/d	Adverse			None			None	None				None		None	None	None	None	None			The implementation of this drought option would result in minor adverse effects on the spread of INNS, water levels and flows, water quality, fluvial geomorphology and visual amenity. Subsequently, the impacts on inter-relationships have been assessed as minor.
	Beneficial	None	None						None	None	None	None	None	None	None	None	None	None		None			Minor beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change. Minor beneficial impacts were assessed due to the drought option resulting in more water being retained in Jumbles Reservoir, which would be expected to have a positive impact on aesthetics.
Jumbles Reservoir 6 Ml/d	Adverse			None			None	None				None		None	None	None	None	None			The implementation of this drought option would result in moderate adverse impacts to water levels and flows, and water quality. Minor adverse impacts are anticipated to biodiversity. A reduction in water levels would also result in minor adverse impacts upon WFD status, fluvial geomorphology, and landscape and visual amenity. Therefore the impact upon inter-relationships has been assessed as minor adverse.
	Beneficial	None	None						None	None	None	None		None	None	None	None	None		None			Improved resilience of water supplies to drought is assessed to have a moderate beneficial impact on adaptation to climate change. Moderate beneficial effects were also identified in relation to population and human health based on continued supply of drinking water. More water retained in the reservoir is anticipated to have a minor beneficial impact on recreation and landscape and visual amenity.
Longden-dale Reservoirs 25 Ml/d	Adverse			None		None	None	None				None		None	None	None	None	None			Moderate adverse impacts are anticipated on water levels and flow. The implementation of this drought option would result in minor adverse impact on biodiversity, water quality and on water dependent ecosystems in the affected reach. There would also be minor adverse impacts on the aesthetics and landscape of the study area
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None	None	None	None			Overall two major beneficial effects were identified relating to population and human health based on continued supply of drinking water. There would also be a minor beneficial impact from the drought option for adaptation to climate change. The remaining beneficial impacts on material assets and resources would be negligible.
Longden-dale Reservoirs 15 Ml/d	Adverse			None		None	None	None				None		None	None	None	None	None			Moderate adverse impacts are anticipated on water levels and flow. The implementation of this drought option would result in minor adverse impact on biodiversity, water quality and on water dependent ecosystems in the affected reach. There would also be minor adverse impacts on the aesthetics and landscape of the study area
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None	None	None	None			Overall two major beneficial effects were identified relating to population and human health based on continued supply of drinking water. There would also be a minor beneficial impact from the drought option for adaptation to climate change. The remaining beneficial impacts on material assets and resources would be negligible.
River Lune LCUS abstraction	Adverse						None	None				None		None	None	None	None	None			Minor adverse effects were identified relating to population and human health due to the impact upon recreation including angling and navigation. The effect on Inter-relationships has also been assessed as minor.
	Beneficial	None	None						None	None	None	None	None	None	None	None	None	None	None	None			Minor to moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Rivington Reservoirs – Brinscall Brook	Adverse			None		None	None	None				None		None	None	None	None	None			Overall minor adverse effects were identified relating to the impact of riverine flow reduction on biodiversity, flora and fauna, water quality, fish populations, ecosystem functions and services and landscape and visual amenity. Negligible adverse impacts are anticipated to the spread of INNS, angling, fluvial geomorphology, archaeology

																						and visual amenity. The impact upon inter-relationships has been assessed as moderate.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Two moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Rivington Reservoirs – White Coppice	Adverse			None		None	None	None				None		None	None	None	None	None				Overall minor adverse effects were identified relating to the impact of riverine flow reduction on biodiversity, flora and fauna, water quality, fish populations, ecosystem functions and services and landscape and visual amenity. Negligible adverse impacts are anticipated to the spread of INNS, angling, fluvial geomorphology, archaeology and visual amenity. The impact upon inter-relationships has been assessed as moderate.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Two moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change
Ullswater	Adverse			None		None						None		None	None			None				Minor adverse effects were identified relating to Material Assets and Resource due to increased energy requirements.
	Beneficial	None	None		None			None	None	None	None	None	None	None	None	None	None		None	None		Overall, minor beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Lake Vyrnwy	Adverse			None			None	None				None		None	None	None	None	None				Overall minor adverse effects were identified relating to the impact on Biodiversity, Population and Human Health, and Water. The effect on Inter-relationships has also been assessed as minor.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a moderate beneficial impact on adaptation to climate change.
Lake Winder-mere	Adverse			None		None		None				None		None	None			None				Minor adverse impacts were identified relating to Biodiversity and Material Assets and Resource Use. The abstraction of water from Windermere will increase energy consumption and, therefore, greenhouse gas emissions, having a minor adverse impact upon Air and Climate. The effect on Inter-relationships has also been assessed as minor.
	Beneficial	None	None		None			None	None	None	None	None	None	None	None	None	None		None	None		The impact of the drought option on population and human health has been assessed as major beneficial based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a moderate beneficial impact on adaptation to climate change.
Carlisle Resource Zone																						
None																						
North Eden Resource Zone																						
Eden Valley boreholes - Bowscar boreholes	Adverse		None	None		None						None		None	None			None				Overall one minor adverse effect was identified relating to the impact of riverine flow reduction on third party abstractors.
	Beneficial	None	None		None		None	None	None	None	None	None	None	None	None	None	None		None	None		Overall, moderate beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a moderate beneficial impact on adaptation to climate change.

Eden Valley boreholes - Gamblesby boreholes	Adverse		None	None		None						None		None	None			None				Overall one minor adverse effect was identified relating to the potential impact of riverine flow reduction on third party abstractors.
	Beneficial	None	None		None		None	None	None	None	None	None	None	None	None	None	None		None	None		Overall, minor beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Eden Valley boreholes - Tarn Wood boreholes	Adverse		None	None		None						None		None	None			None				Overall one minor adverse effect was identified relating to the potential impact of riverine flow reduction on third party abstractors.
	Beneficial	None	None		None		None	None	None	None	None	None	None	None	None	None	None		None	None		Overall, moderate beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.

Legend:

Major Beneficial
Moderate Beneficial
Minor Beneficial
Negligible
Minor Adverse
Moderate Adverse
Major Adverse
NOT APPLICABLE
Uncertain - Insufficient data available to undertake assessment

Mitigation and Monitoring

Consideration of mitigation measures has been an integral part of the SEA process. The SEA appraisals have been based on residual impacts, i.e. those impacts likely to remain after the implementation of reasonable mitigation.

During implementation of one or more drought options, appropriate monitoring will be undertaken to track any potential environmental effects which will in turn trigger deployment of suitable and practicable mitigation measures. Prior to implementation, UU will review the specific requirements for environmental monitoring in consultation with the Environment Agency, Natural England and Natural Resources Wales (as appropriate).

Going Forward

The Draft Drought Plan 2022 and the SEA Environmental Report have been issued for public consultation. Comments received through this consultation have led to a Revised Draft Drought Plan 2022, and, where appropriate to do so, these changes have been assessed using the approach to SEA set out in this report. The Revised Draft Drought Plan 2022 will subsequently be published as a Final Drought Plan and an SEA post-adoption statement produced. When the Drought Plan is implemented during an actual drought event, UU will monitor its effects on the environment, helping to ensure that the potential impacts identified in the SEA are considered in practice.

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1 Introduction

1.1 Background and Purpose of Report

Under the Water Act 2014, United Utilities (UU) is required to prepare and update a Drought Plan every five years. United Utilities (UU) published their current statutory Final Drought Plan in June 2018, with minor amendments made in August 2019 to incorporate lessons learned during the dry weather in 2018. UU are now preparing the Revised Draft Drought Plan 2022 which will encompass the period 2022-2027. It has been determined that Strategic Environmental Assessment (SEA) and a Habitats Regulations Assessment (HRA) are required.

The focus of this SEA is on the Drought Plan, not the Water Resources Management Plan (WRMP). The aim of the Drought Plan is for UU to identify drought options available to meet water demand in times of severe water shortage. UU's water supply system, the drought planning process and links with the WRMP are discussed further in Section 1.3.

SEA of plans and programmes is a statutory requirement under the Environmental Assessment of Plans and Programmes Regulations 2004. The purpose of SEA is to provide high level and strategic protection of the environment by incorporating environmental considerations into the preparation of plans and policy. In the context of drought planning, SEA assists in the identification of the likely significant environmental effects of UU's drought options and determines how any adverse impacts might be mitigated. More information about SEA, and the rationale for applying it to UU's Revised Draft Drought Plan 2022, is provided in Section 1.2.

This Environmental Report (ER) is the second output of the SEA. Its purpose is to present the predicted environmental effects of UU's Drought Plan, in a form suitable for public consultation and use by decision-makers. In March 2020, a Scoping Report, which summarised the baseline and framework that would be used for the SEA, was issued for consultation to environmental regulators in support of UU's Draft Drought Plan 2022[1]. Issues raised by consultees in response to the Scoping Report have been considered in preparing this Environmental Report (see Section 1.8 Consultation). Section 1.8.3 provides details of how to comment on this Environmental Report.

This Environmental Report presents the baseline information that sets the context for the assessment (Section 2) and provides details of the methods employed in undertaking the assessment (Section 3). The potential impacts of the various Drought Plan options are outlined in Section 4, with the impacts of cumulative, or in-combination, effects of options included in the Revised Draft Drought Plan 2022 set out in Section 5. Information regarding mitigation and monitoring is provided in Section 6. A summary is provided in Section 7.

The findings of the SEA are presented within this Environmental Report, which accompanies UU's submission of the Revised Draft Drought Plan 2022 to Defra and the Welsh Government.

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 ('the SEA Regulations') requiring the assessment of effects of certain plans and programmes on the environment. The objective of SEA is to:

[1] Ricardo Energy and Environment (2020) *Strategic Environmental Assessment of United Utilities' Draft Drought Plan 2021. Scoping Report.* Prepared by Ricardo Energy and Environment for United Utilities. March 2021.

'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.

It should be noted, however, that as stated in the Office of the Deputy Prime Minister (ODPM) SEA Guidelines[2] *"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 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 1.2.3 below.

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 and implementation of drought options within the Drought Plan.

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 of UU's Revised Draft Drought Plan 2022 are considered.

SEA Screening confirmed that UU's Revised Draft Drought Plan 2022 required both SEA and Habitats Regulations Assessment (HRA). The HRA of UU's Revised Draft Drought Plan 2022 has been undertaken in parallel with the SEA and is reported separately. The HRA screening process identifies whether each drought option in the Revised Draft Drought Plan 2022 (either alone, in combination or with other plans or projects) is likely to have significant effects on European designated sites, i.e. sites of international conservation importance. The findings of both the SEA and HRA have fed into the revision of the Drought Plan in an iterative process.

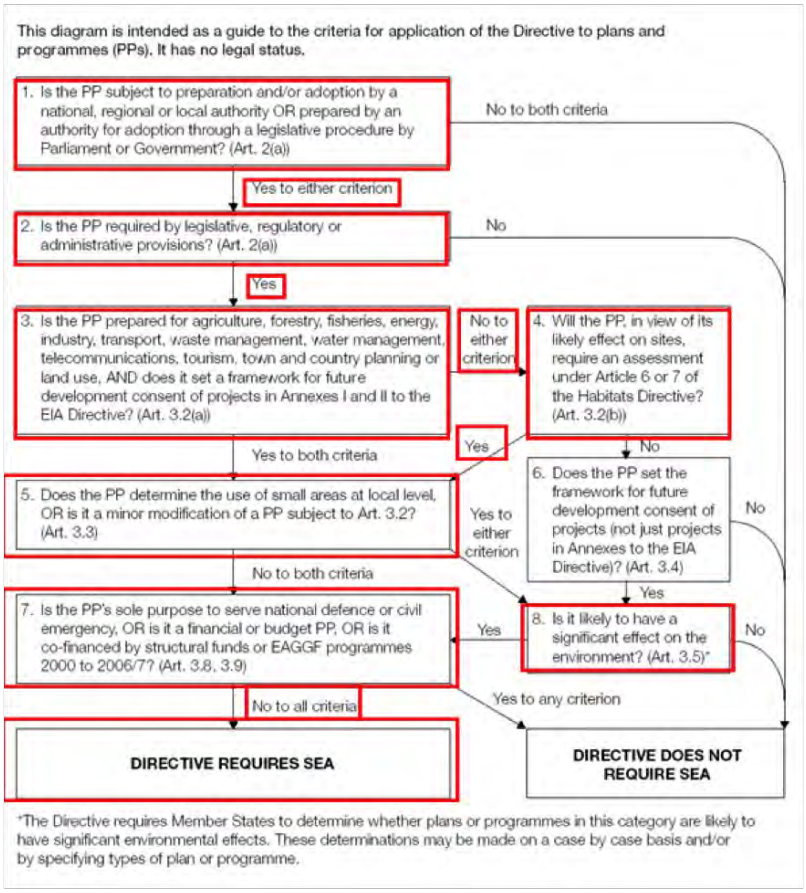
Only those drought options which are relevant to the period encompassed by the Revised Draft Drought Plan are included for consideration as part of the SEA process. To this end, environmental effects of the Revised Draft Drought Plan 2022 options will be considered within the context of the current licence operating conditions. Potential new sources (which UU 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 assessments.

1.2.2 Requirement for SEA and HRA of UU's Drought Plan

SEA Screening has been carried out by UU in accordance with the requirement for a SEA identified under the Environmental Assessment of Plans and Programmes Regulations 2004 and the Office of the Deputy Prime Minister (ODPM) SEA Guidelines[3]. The flow diagram presented in Figure 2 of the ODPM Guidelines has been applied to UU's Revised Draft Drought Plan 2022 and is presented in **Figure 1.1**.

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

Figure 1.1: SEA Screening route of UU's Revised Draft Drought Plan 2022 through Figure 2 flow diagram from ODPM (2005) Guidelines; highlighted in red



The route through the flow diagram has been highlighted in red on **Error! Reference source not found.**, a nd is described below:

1. Is the Plan subject to preparation and/or adoption by a national, regional or local authority OR prepared by an authority for adoption through a legislative procedure by Parliament or Government?
   - **Yes, prepared by an authority for adoption through a legislative procedure by Parliament or Government.**
2. Is the Plan required by legislative, regulatory or administrative provisions?
   - **Yes, required by legislative provisions.**
3. Is the Plan prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use, AND does it set a framework for future development consent of projects in Annexes I and II to the EIA Directive?
   - **No to latter criterion.**
4. Will the Plan, in view of its likely effect on sites, require an assessment under Article 6 or 7 of the Habitats Directive[4]?
   - **Yes, there is potential for impacts on a European designated site which triggers the requirement for Appropriate Assessment under the Habitats Regulations 2017.**
5. Does the Plan determine the use of small areas at local level, OR is it a minor modification of a PP subject to Art. 3.2?

[4] Superseded by the Conservation of Habitats and Species Regulations 2017 (as amended).

- **Yes to latter criterion**.

8. Is it likely to have a significant effect on the environment?

- **Yes (see response to Step 4).**

1. Is the PP's sole purpose to serve national defence or civil emergency, OR is it a financial or budget PP, OR is it co-financed by structural funds or EAGGF programmes 2000 to 2006/7?

- **No to all criteria.**

Result: Requires SEA.

The HRA of UU's Revised Draft Drought Plan 2022 is being undertaken in parallel with the SEA and is reported separately.

1.2.3 Applying Strategic Environmental Assessment to Drought Planning

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 bespoke reaction in terms of measures. In the context of drought planning, individual drought options are taken to constitute alternatives. UU's Revised Draft Drought Plan 2022 comprises a total of 21 drought options (one supply side option, six demand options and 14 drought permit sites).

A Drought Plan does not comprise a discrete, well defined programme of options selected from a long list of potential options, in the same way that a Water Resource Management Plans (WRMP) does. Because of the nature of the consenting system for drought actions, it must include all measures that the company may need to take progressively as the severity of a drought increases, including those that would only be needed in the worst possible drought, perhaps once every 100 years or more. These will typically have very significant environmental effects, but are extremely unlikely to be required in the period of the plan.

The Drought Plan therefore includes a range of possible measures to allow UU 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 (although it is noted that for some resource zones with fewer drought options, it may easier to predict which measures would be implemented in a drought scenario).

The traditional approach to SEA is therefore difficult to apply to Drought Plans. There are no pre-defined programmes of options as such, so the SEA will not be assessing competing measures or recommending the most sustainable selection or programme of measures. It cannot provide a certain prediction of an overall environmental effect of adopting the plan, as its implementation is uncertain. The outputs of the SEA will provide a comparative assessment of the environmental effects of implementing each drought option, which can be used by UU to advise the bespoke measures to be implemented at the time of an actual drought event, and be used to inform the preferred order of the implementation according to its risk.

While an environmental appraisal of each measure can be set out in the SEA for the plan, the lack of predictability of which measures will be implemented in any particular drought event means that it may be impossible to provide an accurate cumulative assessment of the impacts of the plan for a possible future drought event. The approach to cumulative assessment is proposed in Section 3.2.2 and includes consideration of intra- and inter- water resource zone effects, as well as cumulative effects with neighbouring water company Drought Plans.

The Government has produced SEA guidance[5], 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)[6], has been used to inform the methodology for the SEA. These documents provide the recommended best practice guidance for preparation SEAs of drought plans.

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

The Environment Agency's 2020 Drought Plan Guideline (DPG)[7] also includes guidance on the preparation of SEA of Drought Plans. This informs UU's Revised Draft Drought Plan 2022 preparation of the SEA. The Natural Resources Wales (NRW) Water Company Drought Plan Technical Guideline8 (2017) also includes guidance to be followed by companies wholly or mainly in England but which have proposed drought management actions that affect Wales – this is therefore relevant to the United Utilities drought planning process. NRW's guidance includes a requirement to consider all obligations in relation to the Environment (Wales) Act 2016 and the Well-being of Future Generations (Wales) Act 2015 for these drought management actions.

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

1.3.1 Introduction

UU supplies water to approximately 7 million people and 0.2 million non-household customers in Cumbria, Lancashire, Greater Manchester, Merseyside, most of Cheshire and a small portion of Derbyshire.

UU owns and operates over 100 water supply reservoirs, various river and stream intakes, as well as lake abstractions, and numerous groundwater sources (boreholes, springs, mine and adit sources). Abstracted water is treated at water treatment works before being supplied to customers through an extensive network of aqueducts and water mains.

Water supplies to the majority of the region (with more than 90% of total water supplied) are managed in an integrated manner and constitute a single resource zone. The UU region is split into four water resource zones (WRZs):

Strategic Resource Zone: The Strategic Resource Zone is a combination of the merging of the previous Integrated Resource Zone and West Cumbria Resource Zone, serving south Cumbria, Lancashire, Greater Manchester, Merseyside, most of Cheshire, Workington, Whitehaven, Wigton and Solwa, representing over 90% of total water supplied by UU. A 55km bi-directional pipe, the West-East link, was commissioned in 2011 to allow up to 100Ml/d of water to be transferred between Cheshire/Merseyside and Manchester. This link allows UU more flexibility to move water around the region to where it is most needed, and enables UU to carry out aqueduct cleaning by providing a second pipeline. This is in addition to the link between Liverpool and Manchester which was constructed following the 1995/6 drought.

Carlisle Resource Zone: The Carlisle Resource Zone serves the Carlisle area. It is supplied by two sources – the River Gelt and the River Eden.

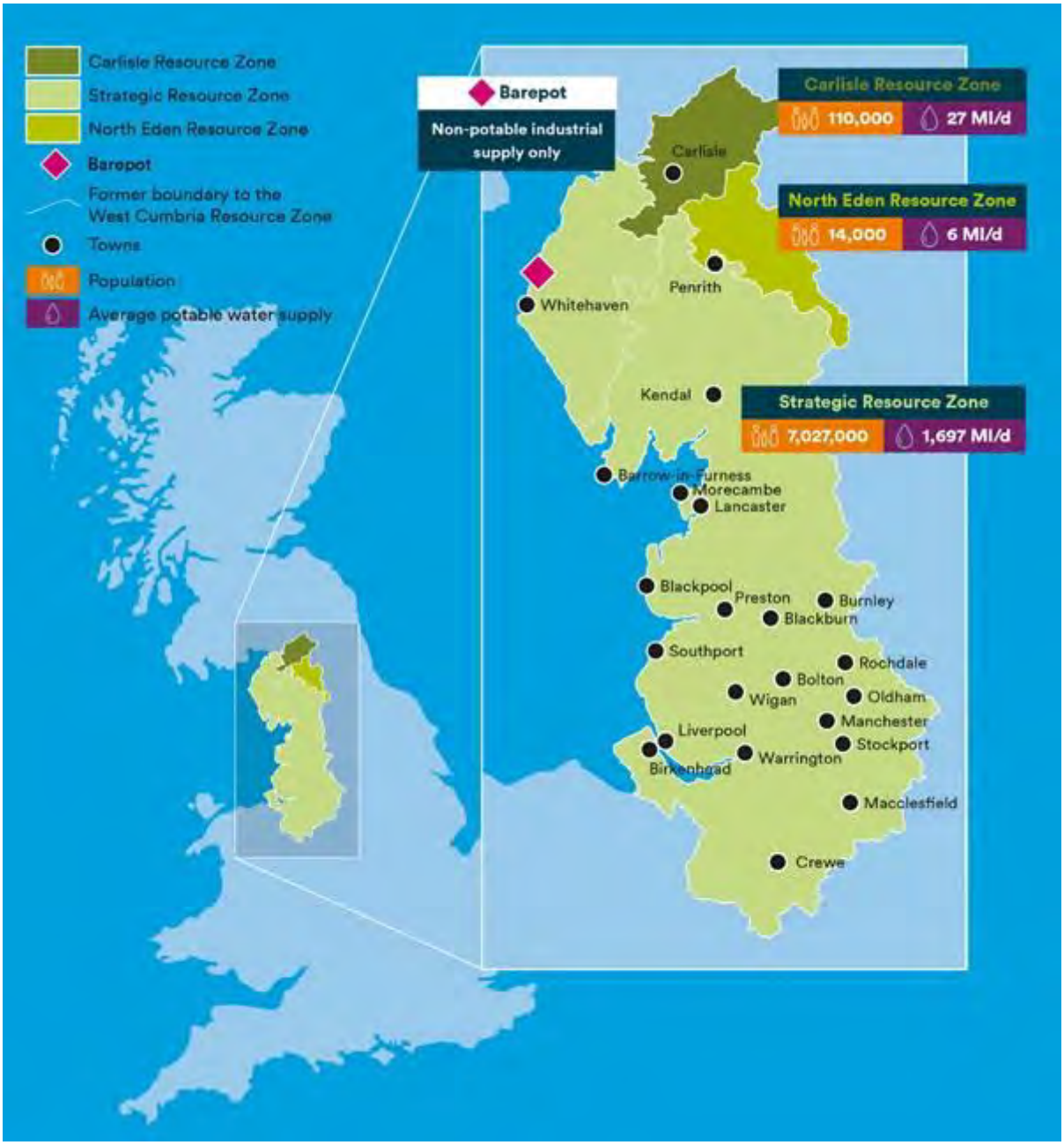
North Eden Resource Zone: The North Eden Resource Zone comprises of boreholes that serve the rural, northern part of the Eden district of Cumbria. The Alston area is supplied from a bulk water supply from Northumbrian Water.

Barepot Resource Zone: The zone is supplied by a surface water abstraction from the River Derwent at Barepot, Workington. This comprises of a non-potable supply to industrial customers at Barepot in West Cumbria.

The four WRZs that will exist from 2022 are shown in **Figure 1.2**

[7] Environment Agency (2020) Water Company Drought Plan Guideline, December 2020 (Version 1.1)
[8] Natural Resources Wales (2017) Water Company Drought Plan Technical Guideline, August 2017.

Figure 1.2: United Utilities WRZs



1.3.2 Link to Water Resources Management Plan

UU published its last Water Resources Management Plan (WRMP) in 2019 which provides a comprehensive statement of UU's water supply and water demand forecasts over the period 2020 to 2045. It also describes the resulting supply-demand balances and the actions UU propose to take as part of the preferred strategy to achieve water supply reliability standards for their customers. The WRMP is updated every 5 years.

The WRMP identifies if there is expected to be a deficit in the future availability of water supplies compared to demand over a 25 year horizon, resulting in the need for new sources of water or demand measures to ensure the balance between supply and demand is maintained. The assessment takes climate change into account, as well as any changes to abstraction licences (e.g. the Environment Agency's review of our abstraction licences under the Habitats Directive referred to as the Review of Consents). The WRMP also makes allowance for parts of the water supply system being out of service for maintenance. The Final WRMP 2019 identified the preferred solutions for dealing with forecast deficits over the 2020-2045 period. The baseline supply-demand balance assessments of the plan demonstrated that a surplus will be maintained in all four of the resource zones, other than a very small deficit in the Strategic Resource Zone towards the end of the planning horizon (2041-2045). This will be addressed by reducing the demand for water and a proposed programme of leakage reduction activity. Resilience assessments identified a key risk to supplies in the Manchester and Pennines area which will be addressed by replacing degrading aqueduct tunnels with new tunnels.

The aim of the Drought Plan is for UU to identify drought options available to meet water demand in times of severe water shortage, and leakage control is a key priority of both the WRMP and Drought Plan. Leakage detection and repair activities will be enhanced during a period of severe water shortage, as set out in the Drought Plan. The predicted future baseline for leakage control is outlined in the WRMP. The supply-demand appraisal demonstrates that reducing leakage to the levels shown below is an efficient and integral part of UU's water resources and demand strategy.

To clarify, the aim of this SEA Environmental Report is to focus on the Drought Plan, not the WRMP. UU's drought planning process is discussed further in Section 1.4 below.

1.4 UU's Drought Planning Process and Drought Options

1.4.1 Overview and timetable of drought planning process

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

UU published its first Final Statutory Drought Plan in January 2008. 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. UU considered these changes in

legislation to be a material change and submitted a revised Draft Drought Plan to the Secretary of State (and copied to the Welsh Government) by 1 October 2011 (i.e. 12 months after the date the new legislation came into force). The Draft Drought Plan was accompanied by the SEA Environmental Report and the HRA Screening Report. UU published a Final Drought Plan on 13 June 2013.

Subsequently, following discussions with Defra in summer 2013, UU updated the Final Drought Plan 2013 to include revised drought triggers, a supply-side option and two additional drought order options. Following endorsement from the Secretary of State, UU published its Draft Drought Plan, SEA and HRA for public consultation in early 2014. UU submitted a Revised Draft Drought Plan to Defra which incorporated changes set out in a Statement of Response, and following direction from Defra, UU published a revised statutory Drought Plan in July 2014.

In 2016 UU confirmed revisions to two drought options and these alterations were considered a 'material change' to the Final Drought Plan 2014. Consequently, a revised draft Drought Plan was submitted to Defra within 6 months of the material change, and subsequently the Final Drought Plan 2018 was published in June 2018, with minor amendments made in August 2019 to incorporate lessons learned during the dry weather in 2018.

UU are now preparing the Revised Draft Drought Plan 2022, which will encompass the period 2022-2027.

Permissions to abstract water, granted through licences issued by the Environment Agency and held and operated by UU, have been subject to a 'Review of Consents' in accordance with Regulation 63 of the Habitats Regulations. This Review of Consents was undertaken by the Environment Agency and includes screening to determine 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 is in order to ensure that the integrity of the European site is not at risk from the impacts of abstraction. The conclusion of the HRA Screening and the SEA for each drought option should be reviewed at the time of any future application for drought powers to ensure they remains valid.

Only those drought options which are relevant to the period encompassed by the revised Drought Plan will be included for consideration as part of the SEA and HRA process. To this end, environmental effects of the Revised Draft Drought Plan 2022 options will be considered within the context of the current licence operating conditions. Potential new sources (which UU 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 assessments.

1.4.2 UU's Drought Options

In the 2018 Final Drought Plan UU identified four triggers that act as decision-points for implementing drought management actions and options. These have now changed to drought levels (Level 1 to Level 4) in accordance with the 2020 DPG. Drought levels vary for each water resource zone and the nature of the drought management actions associated with the drought level varies depending on the prevailing situation.

Drought actions may be applied either company wide, by water resource zone or to target a specific geographic area, depending on the nature of the drought event prevailing at that time. The Revised Draft Drought Plan 2022 contains a range of potential drought management options available to UU, for example bringing contingency water sources into use, implementation of drought permits and water use restrictions.

There are three overall categories of drought options which are described below:

- utilisation of existing licensed water sources within UU's resource base (referred to as supply side options)
- demand side options (e.g. water use restrictions)
- drought permits (i.e. modification to the conditions of an existing abstraction licence).

Supply Side Options

All supply side options are actions within existing licensed abstraction limits which have been subject to the Environment Agency's Review of Consents process.

The supply side drought options in UU's Drought Plan 2018 have been revised. Several previous non-commissioned sources listed as supply side options in the previous drought plan were recommissioned and brought online as part of the 2018 dry weather event and are now considered 'business as usual' sources. In addition, a review of the remaining non-commissioned sources was undertaken during the preparation of the Revised Draft Drought Plan 2022 to assess the availability and benefit they would provide. It was determined that ten boreholes would therefore be removed from the drought plan. These sources are now part of the normal operating suite of sources. By bringing the non-commissioned sources into regular use, utilisation of such sources will assist in taking demand off the regional or local water supply system, making it more resilient overall compared to the previous suite of supply options.

A summary of the construction activities required in order to bring each of the supply side drought options into operation is provided in **Appendix A**.

Table 1.1: Supply side drought options included in the SEA and HRA

Licence
Strategic Resource Zone
None
Carlisle Resource Zone
Castle Carrock Reservoir, dead water storage
North Eden Resource Zone
None

It should be noted that consideration of potential cumulative impacts between existing licensed abstractions (i.e. sources not included within the Drought Plan), supply side options and drought permit options on European sites will be included within the HRA screening assessment.

Demand Side Options

Demand side options are designed to reduce the demand for water and the options available to UU are consistent between all resource zones (see **Table 1.2**). Demand side options have been included in both the SEA and HRA screening.

Table 1.2: Demand side options (all water resource zones)

Measure	Comments
Drought publicity	Increased water efficiency messages via increased customer communications
Enhanced leakage detection and repair	Enhanced leakage detection and repair activities targeted to appropriate areas and where greatest savings can be achieved.
Campaign for voluntary water use restraint	Voluntary water use restrictions (applying to the general use of a hosepipe for domestic purposes) and statutory water use restrictions as set out in Section 76 of the Water Industry Act 1991 (as amended by Section 36 of the Flood and Water Management Act 2010)
Temporary Use Ban (TUB)	Implemented when "experiencing, or may experience, a serious shortage of water for distribution". Due to the level of connectivity a TUB would be applied across each of the WRZs rather than locally.
Ordinary Drought Order (Non-Essential Use Ban)	Drought order to ban non-essential uses of water (as set out in the Drought Direction 2016)
Pressure management	Reducing the pressure in certain parts of UU's water network to help reduce demand.

Demand measures are just part of a suite of options which will be put in place by UU as part of its Drought Plan alongside supply-side options and drought permits.

Drought Permit Options

Drought permits and orders are drought management actions that, if granted, can allow more flexibility to manage water resources and the effects of drought on public water supply and the environment. Guidance has been prepared by Defra[9]: which highlights the main differences between drought permits and orders. One of the key differences is that drought permits are granted by the Environment Agency, with drought orders being granted by the Secretary of State, or the Welsh Minsters, as appropriate.

Drought permit sites included in UU's Revised Draft Drought Plan 2022 are identified in **Table 1.3**. These options were considered in both the SEA scoping and HRA screening processes.

[9] Defra (2020) Supplementary guidance - Drought permits and drought orders. Draft. October 2020.

Table 1.3: Drought permit options (all water resource zones)

Water Source	Potential Drought Permits
Strategic Resource Zone	
Delph Reservoir	Reduce compensation flow from 3.7 to 1.0 Ml/d
Dovestone Reservoir	Reduce compensation flow from 15.9 to 10.0 or 5.0 Ml/d
Fernilee Reservoir	Reduce compensation flow from 13.63 Ml/d to 7 Ml/d.
Jumbles Reservoir	Reduce compensation flow from 19.9 to 12.0 or 6.0 Ml/d
Longdendale Reservoirs	Reduce compensation flow from 45.5 to 22.5 or 15.0 Ml/d
River Lune LCUS abstraction	Reduce prescribed flow from 365.0 to a minimum of 200 Ml/d
Rivington Reservoirs – Brinscall Brook	Reduce compensation flow from 3.9 to 2.0 Ml/d
Rivington Reservoirs – White Coppice	Reduce compensation flow from 4.9 to 2.0 Ml/d
Ullswater	Reduce hands-off flow conditions to a minimum of 175 Ml/d Relax 12-month rolling abstraction licence limit
Lake Vyrnwy	Reduce compensation flow from 45.0 to 25.0 Ml/d
Lake Windermere	Reduce hands-off flow conditions to a minimum of 95 Ml/d Relax 12-month rolling abstraction licence limit
Carlisle Resource Zone	
None	-
North Eden Resource Zone	
Eden Valley boreholes - Bowscar boreholes	Increase annual licence limit to enable continuation of the maximum daily abstraction rate as annual limit constrains abstraction
Eden Valley boreholes - Gamblesby boreholes	Increase annual licence limit to enable continuation of the maximum daily abstraction rate as annual limit constrains abstraction
Eden Valley boreholes - Tarn Wood boreholes	Increase annual licence limit to enable continuation of the maximum daily abstraction rate as annual limit constrains abstraction

In June 2019, the Environment Agency issued water companies with a position statement which set out roles and responsibilities with respect to compensation only reservoirs (CORs). A COR is a reservoir that has no links (direct or indirect) to a water company's public water supply network. The main or sole function of a COR is to provide compensation flow to the downstream watercourse. The legal requirement to provide a compensation flow from a COR is usually found in an abstraction licence, impoundment licence or in an Act of Parliament. A COR would not be listed as a source of supply in a water company water resource management plan or as an option to provide public water supply in a water company drought plan.

Previously, the Environment Agency had included drought orders for CORs within their drought plan and had been responsible for preparing environmental assessment reports (EARs) and applications for drought orders. The revised position stated in June 2019 requires water companies to produce an up-front EAR for drought order implementation at CORs, including an Environmental Monitoring Plan and mitigation proposals. Not all COR sites need to be considered for a future drought order (e.g. not all public water supply reservoirs have associated drought permits) if they are resilient (e.g. the compensation flow is small compared to storage). Hence not all sites will need a shelf-copy EAR. UU and the EA have been working together to refine and agree the list of CORs in UU's operating area where the risk of a drought order warrants production of a shelf copy EAR. It has been agreed that no shelf-copy EARs for CORs currently need to be prepared.

As there is no public water supply benefit of a drought order at a COR, although reference to CORs with associated drought orders may be made in UU's Revised Draft Drought Plan, UU would not be the party

applying for a drought order for a COR, and therefore the SEA and HRA assessments will not include these. They would however be considered in the in-combination / cumulative assessments.

Supporting Information

Drought options included in the SEA and HRA will be documented by UU in its Revised Draft Drought Plan 2022 and presented in drought management option forms as specified by Drought Plan Guideline[10]. Information provided in these forms has been used to inform the SEA and vice versa.

It is noted that some drought options may have different environmental effects depending on season of implementation (for example a summer *vs.* a winter drought). As drought measures can theoretically be required and implemented at any time of year, overall impacts are assessed on a worst-case basis.

Detailed environmental assessment studies of all of UU's drought permit sites have been carried out and information from these studies has been used to inform the SEA and HRA Screening (see Sections 1.5 and 3.3).

Defining the list of Drought Options and Alternatives

In the context of drought planning, individual options are taken to constitute alternatives.

It should be noted that revision of the Drought Plan options has been undertaken in parallel with preparation of the SEA and HRA, and the results of these latter two assessments has fed into the revision of the Drought Plan in an iterative process.

The list of drought options and the assessments provided in this document will be revised to reflect any changes between the Draft and Final Drought Plans.

Supporting Information

Drought options included in the SEA and HRA will be documented by UU in its Revised Draft Drought Plan 2022 and presented in drought management option forms as specified by Drought Plan Guideline[11], specifically the July 2020 'Environmental Assessment for Water Company Drought Plans - supplementary guidance'. Information provided in these forms will be used to inform the SEA.

It is noted that some drought options may have different environmental effects depending on season of implementation (for example a summer *vs.* a winter drought). As drought measures can theoretically be required and implemented at any time of year, overall impacts are assessed on a worst-case basis.

Detailed environmental assessment studies of all of UU's drought permit sites have been carried out and information from these studies has been used to inform the SEA and HRA Screening (see Sections 1.5 and 3.3).

1.5 Drought Permit Environmental Studies

Environmental assessment reports have been prepared for all of the drought permit sites identified in **Table 1.3**, as part of UU's drought contingency planning.

The aim of these studies was to produce environmental reports such that in the event of a drought they are readily available for refreshing based on the prevailing drought situation at that time. The Environment Agency and Natural England were key consultees for the studies. The environmental studies consider all potentially affected habitats and species including, but not limited to, SAC, SPA and

[10] Environment Agency (2020) Water Company Drought Plan Guideline, December 2020 (Version 1.1)
[11] Environment Agency (2020) Water Company Drought Plan Guideline, December 2020 (Version 1.1)

Ramsar features as well as any SSSI or priority habitat and species. The reports also include Environmental Monitoring Plan (EMP) recommendations for each drought permit site. These environmental studies, undertaken outside of an actual drought event, are intended to be used as the basis for the Environmental Report to be prepared in support of a specific drought permit application, should the need arise.

UU has updated the environmental studies at all of the drought permit sites as part of the Revised Draft Drought Plan 2022 preparation (see **Table 1.3**). Environmental Reports, with date of completion are listed in **Table 1.4**.

Table 1.4: Drought permit sites Environmental Assessments

Drought Permit Site	Date Completed
Strategic Resource Zone	
Delph Reservoir	2021
Dovestone Reservoir	2021
Fernilee Reservoir	2021
Jumbles Reservoir	2021
Longdendale Reservoirs	2021
River Lune LCUS abstraction	2021
Rivington Reservoirs – Brinscall Brook	2021
Rivington Reservoirs – White Coppice	2021
Ullswater	2021
Lake Vyrnwy	2020
Lake Windermere	2021
Carlisle Resource Zone	
None	-
North Eden Resource Zone	
Eden Valley Boreholes	2021

Information from the detailed environmental assessments has been used to inform the SEA and HRA. The methodology for the SEA is described in further detail in Section 3.

1.6 Stages of SEA Process

SEA screening has been undertaken, and it has been confirmed that UU's Revised Draft Drought Plan 2022 required SEA (see Section 1.2.2).

Table 1.5 is an extract from the Government's SEA guidance[12] that sets out the main stages of the SEA process and the purpose of each task within the process.

Stage A: *Setting the context and objectives, establishing the baseline and deciding on the scope* has been completed by UU. A Scoping Report was issued to consultees from the environmental regulators (Environment Agency, Natural England and Natural Resources Wales, Historic England and Cadw) on 16 March 2020 (see Section 1.8 below) which provided an opportunity for them to provide views on the proposed scope and level of detail of the Environmental Report.

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

Specific guidance on the application of the SEA process to Drought Plans is provided in a best practice publication by UKWIR[13].

Table 1.5: 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.
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

[12] Office of the Deputy Prime Minister (2005). *A Practical Guide to the Strategic Environmental Assessment Directive*.
[13] UKWIR (2021) Strategic Environmental Assessment and Habitats Regulations Assessment of Drought Plans (UKWIR Project WR/02/S). Prepared by Ricardo Energy and Environment.

SEA Stages and Tasks	*Purpose*
	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 the Environmental Report

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

Section 2 – Baseline and Context, presents the baseline information that sets the context for the assessment. Information on the current state of the environment within UU's water supply area is provided along with a review of other policies, plans and programmes which will influence the Drought Plan.

Section 3 – Methodology, provides details of the methods employed in undertaking the assessment including the cumulative effects assessment methodology.

Section 4 – Assessment of Drought Options, presents the potential impacts of the various drought plan options against the SEA framework.

Section 5 – 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 6 – Mitigation and Monitoring, discusses measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the Drought Plan and monitoring to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures.

Section 7 – Summary.

1.8 Consultation Process

1.8.1 Overview

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.

UU set up a Project Steering Group (PSG) to include key consultees and parties involved in the SEA and HRA process, including the Environment Agency, Natural England and Natural Resources Wales. This forum encouraged regulators to voice any concerns in a timely manner outside the formal consultation process, which, as documented below, was also undertaken in parallel, according to statutory requirements.

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 18 March 2020 to the Environment Agency, Natural Resources Wales, Historic England, Natural England and Cadw. The consultation period ran from 18 March 2020 to 29 April 2020. The Statutory consultees were invited to comment on the report and the proposed scope of the SEA. A meeting with the statutory consultees was held on 6 May 2020 to discuss the proposed approach. A summary of the issues raised and responses to comments are presented in **Appendix B**.

1.8.3 Consultation on the Environmental Report

This Environmental Report has been produced in accordance with the approach agreed by UU and taking into consideration the responses received from consultation bodies in response to the Scoping consultation. SEA reporting provides assessments of the likely significant effects of the drought options considered and selected by UU. This information is set out in this Environmental Report has been be publicly consulted upon alongside UU's Draft Drought Plan 2022.

2 Baseline and Context

2.1 Introduction

In accordance with the SEA Regulations, a review of relevant policies, plans and programmes is presented in Section 2.2. Baseline environmental information is presented in Section 2.3. A summary of key issues has been prepared and is presented in Section 2.4.

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 UU's Drought Plan might be affected by other plans, to identify other environmental protection objectives which the Drought Plan should consider and to help to identify the objectives for the SEA.

The plans and programmes were identified from the wide range that have been produced at an international, national, regional and local level. The following criteria were used to help ensure that the review focuses on the plans and programmes most relevant to this SEA:

- Relevance to the Drought Plan - if the plan or programme did not have a significant effect on achieving the objectives of the Drought Plan or the Drought Plan does not have a significant effect on achieving the objectives of the other plan or programme, then it was not included.
- Relevance to UU - plans for the North West region (which covers an area broadly similar to the area covered by UU) which reflected national and international priorities were considered to be most relevant.

International, national, regional and local policies, plans, programmes and strategies reviewed are listed in **Table 2.1**, with the findings of the review provided in **Appendix C**. The information from this review has been used to direct the presentation of baseline information on the current environmental and social characteristics of UU's water supply area (Section 2.3), and to develop proposed objectives for the SEA (Section 3.1).

Table 2.1: Policy, plans and programmes reviewed

International
Bern Convention (1979), The Convention on the Conservation of European Wildlife and Natural Habitats
Bonn Convention (1979), The Convention on the Conservation of Migratory Species of Wild Animals
The Paris Agreement (2016), The Cancun Agreement (2011) & Kyoto Agreement (1997)
Council of Europe (1992) Convention on the Protection of Archaeological Heritage (Valetta Convention)
Council of Europe (2000), European Landscape Convention (Florence Convention)
Council of Europe (2003) European Soils Charter
Granada Convention (1985) Convention for the Protection of the Architectural Heritage of Europe
European Commission (2014) 2030 Policy Framework for Climate and Energy
European Commission (2014) The EU Regulation on invasive alien (non-native) species
European Commission (2013) Strategy on Adaptation to Climate Change
European Commission (2011) The EU Biodiversity Strategy to 2020
European Commission (2011) A Roadmap for Moving to a Competitive Low Carbon Economy in 2050
European Commission (2010) Industrial Emissions Directive (integrated pollution prevention and control) 2010/75/EU
European Commission (2009) Birds Directive 2009/147/EC
European Commission (2009) Promotion of the use of energy from renewable sources Directive 2009/28/EC
European Commission (2008) Marine Strategy Framework Directive 2008/56/EC
European Commission (2008) Ambient Air Quality Directive 2008/50/EC

European Commission (2007) Floods Directive 2007/60/EC
European Commission (2007) The Eel Directive 2007/1100/EC
European Commission (2006) Sustainable Development Strategy
European Commission (2006) The Bathing Waters Directive 2006/7/EC
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
European Commission (2006) Thematic Strategy for Soil Protection
European Commission (2006) Fresh Water Fish Directive 2006/44/EC
European Commission (2004) Environmental Liability Directive 2004/35/EC
European Commission (2002) The Environment Noise Directive 2002/49/EC
European Commission (2001) SEA Directive 2001/42/EC
European Commission (2000) The Water Framework Directive 2000/60/EC
European Commission (1999) Landfill of Waste Directive 99/31/EC
European Commission (1998) Drinking Water Directive 1998/83/EC
European Commission (1992) The Habitats Directive 1992/43/EEC
European Commission (1991) Urban Waste Water Treatment Directive 1991/271/EEC
European Commission (1991) The Nitrates Directive 91/676/EEC
Ramsar Convention (1971), The Convention on Wetlands of International Importance
United Nations (2002) The World Summit on Sustainable Development.
UNESCO (1972) Convention Concerning the Protection of the World Cultural and Natural Heritage.
United Nations (1992) Convention on Biological Diversity (CBD)
United Nations Economic Commission for Europe (1998), Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

National

Cadw, CCW and ICOMOS (UK)(International Council on Monuments and Sites) (2001) Register of Landscapes of Historic Importance
Countryside Council for Wales (CCW) (2003) Priority Habitats of Wales
DECC (2011) National Policy Statements for Energy Infrastructure
DECC (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity
DECC (2007) Energy White Paper: Meeting the Energy Challenge
Defra (2002) The Strategy for Sustainable Farming and Food – facing the future
Defra (2004) Rural Strategy
Defra (2004) The First Soil Action Plan for England
Defra (2005) Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England
Defra (2005) Securing the Future; Delivering UK Sustainable Development Strategy
Defra (2006) Shoreline Management Plan Guidance
Defra (2007) Conserving Biodiversity in a Changing Climate: Guidance on Building Capacity to Adapt
Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland
Defra (2008), England Biodiversity Strategy –climate change adaptation principles
Defra (2008) Future Water: the Government's water strategy for England
Defra (2009) The Groundwater (England and Wales) Regulations 2009
Defra (2009) Safeguarding our Soils – A Strategy for England
Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network
Defra (2011) UK National Ecosystem Assessment and Defra (2014), UK National Ecosystems Assessment Follow on, Synthesis of Key Findings
Defra (2011) Water for Life - Water White Paper
Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services
Defra (2011) Government Review of Waste Policy in England 2011
Defra (2012) National Policy Statement for Waste Water
Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report
Defra (2013) The National Adaptation Programme – Making the Country Resilient to a Changing Climate

Defra (2015) The government's response to the Natural Capital Committee's Third State of Natural Capital report
Defra (2015) The Great Britain Invasive Non-native Species Strategy
Defra (2020) Drought Plan Direction 2020
Defra (2016) Guiding principles for water resources planning for water companies operating wholly or mainly in England
Defra (2017) Air Quality Plan for Nitrogen Dioxide (NO2) in UK
Defra and Environment Agency (2019) How to Write and Publish a Drought Plan (Draft Consultation)
Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living
Defra and Welsh Government (2014), River Basin Planning Guidance
Department of Trade and Industry, Energy white paper. Our energy future: creating a low carbon economy (2003)
Department for Culture, Media and Sport (2001) The Historic Environment – A Force for the Future
Environment Agency (2020) Water Company Drought Plan guideline
Environment Agency (2004), Catchment Flood Management Plans: Guidelines – Volume 1 Policy
Environment Agency (2007), Soil: A Precious Resource
Environment Agency (2008) Better Sea Trout and Salmon Fisheries: Our Strategy for 2008-2021
Environment Agency (2009), Water for People and the Environment - Water Resources Strategy for England and Wales
Environment Agency, (2010) Water Resources Action Plan for England and Wales
Environment Agency (2013), Managing Water Abstraction
Environment Agency (updated 2015) Creating a Better Place: Environment Agency Corporate Strategy 2014-2016
Environment Agency (2016) Drought plan guideline extra information: Environmental assessment for water company drought plans
Environment Agency and Natural Resources Wales (2018), Water Resources Planning Guideline: Interim update
Environment Agency, WFD River Basin Characterisation Project: Technical Assessment Method - River abstraction and flow regulation. EA, undated
Environment Agency, Shoreline Management Plans
Environment Agency (undated) Hydroecology: Integration for modern regulation
English Heritage (2008), Climate Change and the Historic Environment
English Heritage (2010), Heritage at Risk
Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment
HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment
HM Treasury Infrastructure UK (2014) National Infrastructure Plan
MHCLG (2018) National Planning Policy Framework 2018
Ancient Monuments and Archaeological Areas Act 1979
Conservation of Habitats and Species Regulations 2017
Environment Act, 1995
Environment (Wales) Act 2016
Flood and Water Management Act, 2010
Marine and Coastal Access Act, 2009
Natural Environment and Rural Communities Act, 2006
National Assembly for Wales (2015) Well-being and Future Generations (Wales) Act 2015
Natural England (2011) UK Geodiversity Action Plan
Natural Resources Wales (2020) Salmon and sea trout plan of action for Wales
Planning (Listed Buildings and Conservation Areas) Act 1990
Salmon and Freshwater Fisheries Act, 1975
The Climate Change Act 2008
The Countryside and Rights of Way (CROW) Act, 2000
The Eels (England and Wales) Regulations 2009
The Energy Act 2013

The Environmental Damage (Prevention and Remediation) (England) Regulations 2015
The Water Act 2003
The Water Environment (WFD) (England and Wales) Regulations, 2003
UKCIP (2009) UK Climate Projections UKCP09,
UKTAG: Phase 3 Review of Environmental Standards
Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010
Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 SI 3104
Wales Biodiversity Partnership Section 42 Species and Habitats of Principle Importance to Wales
Welsh Government (2012) Energy Wales: A Low Carbon Transition
Welsh Government (2015) Water Strategy for Wales
Welsh Government (2016) The State of Natural Resources Report (SoNaRR)
Welsh Government (2017) Natural Resources Policy
Welsh Government (2018) Planning Policy Wales (Edition 10)
Welsh Government (2019) Draft National Development Framework (final emerging 2020)
Welsh Government (2019) Draft National Strategy for Flood and Coastal Erosion Risk Management Wildlife and Countryside Act, 1981

Regional

Canal & Rivers Trust (2015) North West Waterway Fisheries & Angling Action Plan
Environment Agency, (undated) Managing Drought in the North West
Environment Agency (2012), Midlands Region Drought Plan
Environment Agency (2016) North West River Basin District River Basin Management Plan
English Heritage, now known as Historic England, Heritage at Risk Register: North West (2018) and West Midlands (2018)
Natural Resources Wales, Drought Plan
United Utilities (2019) Final Water Resources Management Plan 2019
United Utilities (2020) Revised Business Plan 2020-2025
Water Company (various) Drought Plans:
Hafren Dyfrydwy Draft Drought Plan 2019
Dwr Cymru Welsh Water Draft Drought Plan 2020
Severn Trent Draft Drought Plan 2019-2024
Yorkshire Water Draft Drought Plan 2019
Northumbrian Water Final Drought Plan 2019
Water Company (various) Water Resources Management Plans (published and draft):
Hafren Dyfrydwy Final Water Resources Management Plan 2019
Dwr Cymru Welsh Water Final Water Resources Management Plan 2019
Severn Trent Final Water Resources Management Plan 2019
Yorkshire Water Revised Draft Water Resources Management Plan 2019
Northumbrian Water Final Water Resources Management Plan 2019

Sub-regional/Local

Area of Outstanding Natural Beauty (AONB) Management Units (various) AONB Management Plans
Local Biodiversity Action Plans (BAPs) (various)
Cheshire and Warrington Enterprise Partnership (2017) Cheshire and Warrington Matters, A Strategic and Economic Plan for Cheshire and Warrington
Cumbria Strategic Partnership, Sustainable Cumbria - A sub-regional strategy for Cumbria (2004)
Defra (2010), Eel Management Plans (various)
Environment Agency (2013) Abstraction Licensing Strategies (CAMS process)
Greater Manchester Combined Authority (2017), Our People Our Place: Greater Manchester Strategy Greater Manchester Combined Authority (2019) Greater Manchester Spatial Framework Draft 2019
Hadrian's Wall Partnership Board (2015), Hadrian's Wall Management Plan 2015-2019
Lake District National Park Authority (2010) Core Strategy
Lake District National Park Authority (2008) Landscape Character Assessment and Guidelines
Lake District National Park Authority (2006) A Vision for 2030
National Park Management Plans (various):

Lake District National Park Partnership – The Management Plan 2015-2020
Peak District National Park Management Plan 2018-2023
Lake District National Park – State of the Park (2018): Reporting on the Partnership's Plan 2015-2020
Snowdonia National Park Management Plan 2010-2015
Yorkshire Dales National Park Management Plan 2019-2024
Local Planning Authority (various) Land Use Plans
Local Geodiversity Action Plans (LGAPs)
Local Planning Authority (various) Local Plans/Local Development Plans
Local Wildlife Trust Strategies (various)
Natural England, Site Improvement Plans (SIPs) for Natura 2000 Sites (various)
Natural England National Character Area (NCA) Profiles (various)
Natural England and Environment Agency (various) River Restoration and Water Level Management Plans
Outline Water Cycle Studies
One West Lancs Partnership
Public Rights of Way Improvement Plans (ROWIPs)

Key policy messages have been reviewed for each SEA topic and are summarised in **Table 2.2.**

Table 2.2: Key Policy Messages

SEA Topic	Key Messages	Policies
Biodiversity, flora and fauna	Conservation and enhancement of the natural environment and of biodiversity, principally designated sites (international and national) and priority habitats and species, whilst considering climate change and ability to adapt.	**International:** Bern Convention (1979), The Convention on the Conservation of European Wildlife and Natural Habitats Bonn Convention (1979), The Convention on the Conservation of Migratory Species of Wild Animals European Commission (2014) The EU Regulation on invasive alien (non-native) species 1143/2014 European Commission (2011), The EU Biodiversity Strategy to 2020 European Commission, Birds Directive (2009/147/EC) European Commission, Fresh Water Fish Directive (2006/44/EC) European Commission, Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC) European Commission, Habitats Directive (1992/43/EEC) European Commission, The Water Framework Directive (2000/60/EC) Ramsar Convention (1971), The Convention on Wetlands of International Importance United Nations, Convention on Biological Diversity (CBD) (1992) **National:** Conservation of Habitats and Species Regulations 2017 Countryside Council for Wales (CCW) (2003) Priority Habitats of Wales Defra (2002), Working with the grain of nature: a biodiversity strategy for England Defra (2007), Conserving Biodiversity in a Changing Climate: Guidance on Building Capacity to Adapt Defra (2008), England Biodiversity Strategy –climate change adaptation principles Defra (2009), Consultation on modernisation of salmon and freshwater fisheries legislation; new order to address the passage of fish Defra (2010), Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services Defra (2011) UK National Ecosystem Assessment and Defra, 2014, UK National Ecosystems Assessment Follow on, Synthesis of Key Findings Defra (2014) Biodiversity duty: public authority duty to have regard to conserving biodiversity
	Encourage a catchment-wide approach to water use to safeguard protection of the natural environment and biodiversity.	
	To attain favourable condition for priority habitats and species.	
	Avoidance of activities likely to cause irreversible damage to natural heritage.	
	Support well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological works, including provision for fish passage and connectivity for migratory/mobile species.	
	Reinforce the connections between people and nature and appreciate the value of biodiversity.	
	Protection and enhancement of natural capital. Ecosystem services from natural capital contributes to the economy and therefore should be protected and, where possible, enhanced.	
	A need to protect the green infrastructure network.	

SEA Topic	Key Messages	Policies
	To seek opportunities for biodiversity net gain from infrastructure development.	Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report Defra (2015) The Great Britain Invasive Non-native Species Strategy Environment Agency (2020) Water Company Drought Plan guideline Environment (Wales) Act 2016 (Section 6) Natural Resources Wales (2020) Salmon and sea trout plan of action for Wales Environment Agency (undated) Hydroecology: Integration for modern regulation Environment Agency (undated) WFD River Basin Characterisation Project Environment Agency CAMS (various) HM Government (2018) A Green Future: Our 25 year Plan to Improve the Environment MHCLG (2018) National Planning Policy Framework 2018 Natural Environment and Rural Communities (NERC) Act 2006 Salmon and Freshwater Fisheries Act 1975 The Countryside and Rights of Way (CROW) Act, 2000 The Eels (England and Wales) Regulations 2009 UKTAG on the WFD e.g. Phase 3 Review of Environmental Standards Wales Biodiversity Partnership Section 42 Species and Habitats of Principle Importance to Wales Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 Welsh Government (2016) The State of the Natural Resources Report (SoNaRR) Welsh Government (2009) Technical Advice Note 5. Nature Conservation and Planning Welsh Government (2019) Draft National Development Framework (final emerging 2020) Wildlife and Countryside Act, 1981 **Regional/Local:** AONB Management Units (various) AONB Management Plans Greater Manchester Combined Authority (2017), Our People Our Place: Greater Manchester Strategy Lake District National Park Authority (2008) Landscape Character Assessment and Guidelines Lake District National Park Partnership - The Partnership's Plan – The Management Plan for the Lake District National Park 2015-2020 Local Biodiversity Action Plans Local Wildlife Trust Strategies (various) Natural England National Character Area (NCA) Profiles
	Avoidance of activities likely to increase the risk of spread of Invasive Non-Native Species (INNS).	

SEA Topic	Key Messages	Policies
		Peak District National Park Authority (2018), Peak District National Park Management Plan 2018-2023 River Basin Management Plans River Restoration and Water Level Management Plans Snowdonia National Park Authority, Snowdonia National Park Management Plan 2010-2015 Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24
Population and human health	To ensure secure, safe, reliable, dependable, sustainable and affordable supplies of water are provided for all communities and all business sectors.	**International:** European Commission (1998), Drinking Water Directive (1998/83/EC) European Commission (1999) Landfill of Waste Directive (99/31/EC) European Commission (2000), The Water Framework Directive (2000/60/EC) European Commission (2004), Environmental Liability Directive (2004/35/EC) European Commission (2008) Ambient Air Quality Directive (2008/50/EC) United Nations (2002), Commitments arising from the World Summit on Sustainable Development, Johannesburg **National:** Defra (2005) Securing the Future; Delivering UK Sustainable Development Strategy Defra (2008) Future Water: the Government's water strategy for England Defra (2011) Water for Life -Water White Paper Defra (2011) The Natural Choice: securing the value of nature. The Natural Environment White Paper Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living Environment Agency (2009), Water Resources Strategy for England and Wales Environment (Wales) Act 2016 HM Treasury Infrastructure UK (2014) National Infrastructure Plan HM Treasury (2015) Fixing the Foundations: creating a more prosperous nation. HM Government (2018) A Green Future: Our 25 year Plan to Improve the Environment HM Government (2016) National Infrastructure Delivery Plan 2016-2021 MHCLG (2018) National Planning Policy Framework 2018 National Assembly for Wales (2015) Well-being and Future Generations (Wales) Act 2015
	Raise awareness around sustainability, the value of water and using it efficiently.	
	Promotion of healthy communities and protection from risks to health and wellbeing.	
	Protection and improvement of drinking water quality.	
	Water resources play an important health and recreation role. Effective water resource management can create opportunities for regeneration, tourism and the wider economy.	
	Access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and wellbeing of communities.	
	To ensure all communities have a clean, safe and attractive environment in which people can take pride, whilst benefiting the economy.	

SEA Topic	Key Messages	Policies
	Promotion of a sustainable economy supported by universal access to essential utility and infrastructure services.	Water UK (2016) Water Resources Planning Framework (2015-2065) Well-being and Future Generations (Wales) Act 2015 Welsh Government (2015) Water Strategy for Wales Welsh Government (2016) The State of the Natural Resources Report (SoNaRR) Welsh Government (2018) Planning Policy Wales (2018) Edition 10 Welsh Government (2019) Draft National Development Framework (final emerging 2020) **Regional/Local:** Cheshire and Warrington Enterprise Partnership (2017) Cheshire and Warrington Matters, A Strategic and Economic Plan for Cheshire and Warrington Cumbria Strategic Partnership (2004), Sustainable Cumbria - A sub-regional strategy for Cumbria Greater Manchester Combined Authority (2017), Our People Our Place: Greater Manchester Strategy One West Lancs Partnership (formed 2013) Lake District National Park Authority (2006), A Vision for 2030 Lake District National Park Partnership - The Partnership's Plan – The Management Plan for the Lake District National Park 2015-2020 Local Planning Authority (various) Local Plans/Local Development Plans Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24 Peak District National Park Authority (2018), Peak District National Park Management Plan 2018-2023 Snowdonia National Park Authority, Snowdonia National Park Management Plan 2010-2015
	Social and economic consequences of severe droughts.	
Material assets and resource use	Reduce the amount of waste generated through more efficient use of materials, energy and water, thereby promoting sustainable production and consumption.	**International:** European Commission (1999) Landfill of Waste Directive (99/31/EC) United Nations (2002) Commitments arising from the World Summit on Sustainable Development, Johannesburg **National:** Defra (2011) Government Review of Waste Policy in England 2011 HM Government (2016) National Infrastructure Delivery Plan 2016-2021 HM Treasury (2015) Fixing the Foundations: creating a more prosperous nation.
	Contribute to a resource efficient, green and competitive low carbon economy.	
	Ensure sustainable use of water resources and maintain a reliable public water supply, whilst considering issues of water demand, water supply and water quality in the natural environment.	

SEA Topic	Key Messages	Policies
	Government expectation for water companies to continue reducing overall demand for water particularly in areas designated as water stressed, or where demand is above the national average.	HM Treasury Infrastructure UK (2014) National Infrastructure Plan Defra (2008) Future Water: the Government's water strategy for England Environment Agency (2009) Water Resources Strategy for England and Wales Environment (Wales) Act 2016 Environment Act 1995 Environment Agency (2009) Water Resources Strategy for England and Wales Environment Agency (2010) Water Resources Action Plan for England and Wales MHCLG (2018) National Planning Policy Framework 2018 Natural Resources Wales, Drought Plan The Water Act, 2003 Welsh Government (2019) Draft National Development Framework (final emerging 2020) Welsh Government (2018) Planning Policy Wales (2018) Edition 10 Welsh Government (2017) Natural Resources Policy Welsh Government (2016) The State of the Natural Resources Report (SoNaRR) Welsh Government, (2015) A Water Strategy for Wales **Regional/Local:** Environment Agency (undated), Managing Drought in the North West Environment Agency (2015) Greater Manchester, Merseyside and Cheshire Drought Plan Environment Agency (2015) Cumbria and Lancashire Drought Plan Environment Agency (January 2012), Midlands Region Drought Plan Environment Agency Wales (January 2012), Drought Plan United Utilities Ltd (2019), Final Water Resources Management Plan 2019-2045 Water Company (various) Drought Plans adjacent to supply area
	Minimise the production of waste, ensure waste management is in line with the 'waste hierarchy', and eliminate waste sent to landfill.	
	Promote the sustainable management of natural resources.	
Water	Reduce water consumption and promote sustainable water resource management. Ensure appropriate management of abstractions and protect flow and level variability across the full range of regimes from low to high conditions. Maintain and improve water quality (surface waters, groundwater and bathing water). Prevent deterioration of waterbody status and improve the quality of the water environment and the ecology	**International:** European Commission, Drinking Water Directive (1998/83/EC) European Commission, Floods Directive (2007/60/EC) European Commission, The Water Framework Directive (2000/60/EC)) European Commission, Urban Waste Water Treatment Directive (1991/271/EEC) European Commission Environmental Liability Directive (2004/35/EC) European Commission Revised Bathing Water Quality Directive (76/160/EEC) European Commission Urban Waste Water Treatment Directive (91/271/EEC) European Commission Nitrates Directive (91/676/EEC)

SEA Topic	Key Messages	Policies
	which it supports, and continue to provide high levels of drinking water quality. Expand the scope of water quality protection measures to all waters, surface waters and groundwater. 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 into account the impacts of climate change. Promote measures to enable and sustain log-term improvement in water efficiency.	**National:** Defra (2005) Making space for water Defra (2008) Future Water: the Government's water strategy for England Defra (2009) The Groundwater (England and Wales) Regulations 2009 Defra (2011) Water for Life - Water White Paper Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper Defra (2012)The UK Climate Change Risk Assessment 2012 Evidence Report Defra and Welsh Government (2014) River Basin Planning Guidance Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report Defra (2016) Guiding principles for water resources planning for water companies operating wholly or mainly in England Environment Agency (2009) Water Resources Strategy for England and Wales Environment Agency (2010) Water Resources Action Plan for England and Wales Environment Agency (2011) National Flood and Coastal Risk Management Strategy for England Environment Agency (2013), Managing Water Abstraction Environment Agency CAMS (various) Environment Agency Catchment Flood Management Plans Environment Agency and other lead authorities Shoreline Management Plans Flood and Water Management Act (2010) HM Government, (2012) Marine Strategy HM Government (2018) A Green Future: Our 25 year Plan to Improve the Environment National Infrastructure Commission (2018) Preparing for a drier future: England's water infrastructure needs MHCLG (2018) National Planning Policy Framework 2018 Natural Resources Wales, 2016, The State of Natural Resources Report 2016 Natural Resources Wales, Drought Plan Water Resources Management Plans and Drought Plans from adjacent water companies to United Utilities' supply area Water UK (2016) Water Resources Planning Framework (2015-2065) The Water Act (2003) The Water Environment (WFD) (England and Wales) Regulations 2017 The Water resources management plan Regulations 2007 Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010

SEA Topic	Key Messages	Policies
		Welsh Government (2004) Technical Advice Note 15: Development and Flood Risk Welsh Government (2009) Technical Advice Note 5: Nature Conservation and Planning Welsh Government (2012), State of the Environment Report – Wales Welsh Government, (2015) A Water Strategy for Wales Welsh Government (2016) The State of Natural Resources Report (SoNaRR) Welsh Government (2017) Natural Resources Policy Welsh Government (2018) Planning Policy Wales (2018) Edition 10 Welsh Government (2019) Draft National Development Framework (final emerging 2020) Welsh Government (2019) Draft National Flood and Coastal Erosion Risk Management Strategy for Wales UKTAG WFD Guidance Documents (various dates) **Regional/Local:** Environment Agency (2015) Greater Manchester, Merseyside and Cheshire Drought Plan Environment Agency (2015) Cumbria and Lancashire Drought Plan Environment Agency (undated), Managing Drought in the North West Environment Agency, North West Region Catchment Abstraction Management Strategies (CAMS) Environment Agency and Natural Resources Wales (2015), Dee River Basin Management Plan 2015-2021 (2015 proposed update) Environment Agency (2015) North West River Basin District River Basin Management Plan Environment Agency and Natural Resources Wales (2015), Severn River Basin Management Plan 2015-2021 (2015 proposed update) Other relevant water company WRMPs (2019/2020) and Drought Plans (2019-2020) River Restoration and Water Level Management Plans (various) Outline Water Cycle Studies (Various)
Soil, geology and land use	Protect and enhance the diversity and quality of soils and geology (including geological SSSIs), including geomorphology and geomorphological processes which can be damaged or lost by insensitive development. Ensure that soils will be protected and managed to optimise the varied functions that soils perform for	**International:** Council of Europe (2003) European Soils Charter European Commission (2006) Thematic Strategy for Soil Protection European Commission (1999) Landfill of Waste Directive (99/31/EC) **National:** Defra (2009) Safeguarding our Soils – A Strategy for England

SEA Topic	Key Messages	Policies
	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.	Defra (2004) The First Soil Action Plan for England Defra (2004) Rural Strategy 2004 Defra (2002) The Strategy for Sustainable Farming and Food – facing the future Environment Agency (2007) Soil a precious resource: Strategy for protecting, managing and restoring soil MHCLG (2018) National Planning Policy Framework 2018 Natural England (2011) UK Geodiversity Action Plan Welsh Government (2019) Draft National Development Framework (final emerging 2020) Welsh Government (2019) Draft National Flood and Coastal Erosion Risk Management Strategy for Wales Welsh Government (2018) Planning Policy Wales (2018) Edition 10 Welsh Government (2017) Natural Resources Policy Welsh Government (2016) The State of the Natural Resources Report (SoNaRR) Welsh Government (2012), State of the Environment Report – Wales Wildlife and Countryside Act 1981 (as amended) **Regional/Local:** Natural England - National Character Area (NCA) profiles Local Geodiversity Action Plans (LGAPs) Local Planning Authority (various) Local Plans/Local Development Plans Lake District National Park Partnership - The Partnership's Plan – The Management Plan for the Lake District National Park 2015-2020 Lake District National Park Authority (2006) A Vision for 2030 Lake District National Park Authority (2010) Core Strategy Peak District National Park Authority (2018), Peak District National Park Management Plan 2018-2023 Snowdonia National Park Authority, Snowdonia National Park Management Plan 2010-2015 Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24
	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	
Air and climate	Reduce the effects of air pollution on ecosystems.	**International:** The Paris Agreement (2016), The Cancun Agreement (2011) & Kyoto Agreement (1997) European Commission (2008) Ambient Air Quality Directive (2008/50/EC)
	Improve overall air quality.	
	Sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas	

SEA Topic	Key Messages	Policies
	and the cumulative impacts on air quality from individual sites in local areas.	European Commission (2009) Promotion of the use of energy from renewable sources Directive (2009/28/EC) European Commission (2005) Thematic Strategy on Air Pollution **National:** Defra (2013) The National Adaptation Programme: Making the country resilient to a changing climate Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report DECC (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity DECC (2011) National Policy Statements for Energy Infrastructure DECC (2007) Energy White Paper: Meeting the Energy Challenge Department of Trade and Industry (2003), Energy White Paper. Our Energy Future: Creating a Low Carbon Economy Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report Defra (2008), England Biodiversity Strategy –climate change adaptation principles Defra (2008) Future Water: the Government's water strategy for England Defra (2007) The Air Quality Strategy for England, Scotland and Wales Defra (2007) Conserving Biodiversity in a Changing Climate: Guidance on Building Capacity to Adapt English Heritage, now known as Historic England (2008) Climate Change and the Historic Environment Environment (Wales) Act 2016 Environment Agency (2010), Water Resources Action Plan for England and Wales Environment Agency (2009), Water Resources Strategy for England and Wales Environment Agency (2007) Soil: A Precious Resource HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment HM Government (2016) National Infrastructure Delivery Plan 2016-2021 MHCLG (2018) National Planning Policy Framework 2018 Natural England National Character Area (NCA) Profiles The Climate Change Act 2008 The Energy Act 2013 UKCIP (2009) UK Climate Projections UKCP09 (2009) Welsh Government (2012) Energy Wales: A Low Carbon Transition Welsh Government (2017) Natural Resources Policy
	Reduce greenhouse gas emissions. Targets include: reduce the UK's greenhouse gas emissions to net zero by 2050. In Wales, at least an 80% reduction in emissions by 2020.	
	Minimise energy consumption, support the use of sustainable /renewable energy and improve resilience to climate change.	
	Build in adaption to climate change to future planning and consider the level of urgency of associated risk.	
	Need for adaptive measures to respond to likely climate change impacts on water supply and demand.	

SEA Topic	Key Messages	Policies
		Regional/Local: Cumbria Strategic Partnership (2004), Sustainable Cumbria - A sub-regional strategy for Cumbria Greater Manchester Combined Authority (2017), Our People Our Place: Greater Manchester Strategy Peak District National Park Authority (2018), Peak District National Park Management Plan 2018-2023 Outline Water Cycle Studies (Various) Peak District National Park Authority (2018), Peak District National Park Management Plan 2018-2023 United Utilities (2019) Water Resource Management Plan Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24 Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24
Archaeology and cultural heritage	Built development in the vicinity of historic buildings and Scheduled Monuments could have implications for the setting and/or built fabric and cause damage to any archaeological deposits present on the site. Ensure active management of environmental and cultural assets. Ensure effects resulting from changes to water level (surface or sub-surface) on all historical and cultural assets are avoided. Consider effects on important wetland areas with potential for paleoenvironmental deposits. Promote the conservation and enhancement of the historic environment, including the promotion of heritage and landscape as central to the culture of the assessment area and conserve and enhance distinctive characteristics of landscape and settlements. Conserve and enhance the historic environment, heritage assets and their settings.	**International:** Granada Convention (1985) Convention for the Protection of the Architectural Heritage of Europe Valletta Convention (1992) Convention on the Protection of Archaeological Heritage of Europe (revised) The World Heritage Convention (UNESCO) 1972 – a global instrument for the protection of cultural and natural heritage. European Commission (2007), Floods Directive (2007/60/EC) **National:** Ancient Monuments and Archaeological Areas Act 1979 Cadw, Countryside Council for Wales and ICOMOS (UK)(International Council on Monuments and Sites) (2001), Register of Landscapes of Historic Importance Department for Culture, Media and Sport (2001) The Historic Environment – A Force for the Future Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper Defra (2011) UK National Ecosystem Assessment Defra (2004) The First Soil Action Plan for England HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment MHCLG (2018) National Planning Policy Framework 2018

SEA Topic	Key Messages	Policies
		English Heritage, (now known as Historic England) (2008), Climate Change and the Historic Environment English Heritage (2016), English Heritage, now known as Historic England (2016) Heritage at Risk Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3 Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment Planning (Listed Buildings and Conservation Areas) Act 1990 **Regional/Local:** AONB Management Units (various) AONB Management Plans Cumbria Strategic Partnership (2004), Sustainable Cumbria - A sub-regional strategy for Cumbria Greater Manchester Combined Authority (2017), Our People Our Place: Greater Manchester Strategy Hadrian's Wall Partnership Board (2015), Hadrian's Wall Management Plan 2015-2019 Lake District National Park Authority (2006), A Vision for 2030 Lake District National Park Authority (2008) Landscape Character Assessment and Guidelines Lake District National Park Authority (2010) Core Strategy Lake District National Park Partnership - The Partnership's Plan – The Management Plan for the Lake District National Park 2015-2020 Peak District National Park Authority (2018), Peak District National Park Management Plan 2018-2023 Snowdonia National Park Authority, Snowdonia National Park Management Plan 2010-2015 Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24
Landscape and visual amenity	Protection and enhancement of landscape (including designated landscapes, landscape character, distinctiveness 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.	**International:** Council of Europe (2006) European Landscape Convention Council of Europe (2000) European Landscape Convention (Florence Convention) **National:** Cadw, CCW and ICOMOS (UK)(International Council on Monuments and Sites) (2001), Register of Landscapes of Historic Importance The Countryside and Rights of Way (CRoW) Act (2000) Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper

SEA Topic	Key Messages	Policies
	Improve access to valued areas of landscape character in sustainable ways to enhance its enjoyment and value by visitors and stakeholders.	Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network Defra (2004) Rural Strategy Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3 HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment MHCLG (2018) National Planning Policy Framework 2018 Wildlife and Countryside Act 1981 (as amended) **Regional/Local:** AONB Management Units (various) AONB Management Plans Cumbria Strategic Partnership (2004), Sustainable Cumbria - A sub-regional strategy for Cumbria Greater Manchester Combined Authority (2017), Our People Our Place: Greater Manchester Strategy Hadrian's Wall Partnership Board (2015), Hadrian's Wall Management Plan 2015-2019 Lake District National Park Authority (2006), A Vision for 2030 Lake District National Park Authority (2008) Landscape Character Assessment and Guidelines Lake District National Park Authority (2010) Core Strategy Lake District National Park Partnership - The Partnership's Plan – The Management Plan for the Lake District National Park 2015-2020 Natural England - National Character Area (NCA) profiles Peak District National Park Authority (2018), Peak District National Park Management Plan 2018-2023 Snowdonia National Park Authority, Snowdonia National Park Management Plan 2010-2015 Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24

2.3 Review of Baseline

2.3.1 Introduction

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

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

The baseline assessment has drawn on data for the North West of England, as this region is closely related to the UU's water supply operating boundaries, as shown in **Error! Reference source not found.**. Water supplies derived from North East Wales, including the River Dee and Lake Vyrnwy, have been acknowledged and appropriate baseline information from these areas has also been included.

Baseline data given below has been drawn from a variety of sources, encompassing many of the plans and programmes reviewed as part of the SEA process, see **Table 2.1**. The sections will also draw on available data to summarise the likely future trends for the environmental issues being considered. To conclude each sub-section a summary will be provided of the key issues arising from the review.

2.3.2 Limitations of the data and assumptions made

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

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

2.3.3 Overview

The North West of England is the largest region outside London and the South East, encompassing an area of approximately 14,100 km², and comprises the metropolitan areas of Manchester and Merseyside and the three counties of Cheshire, Cumbria, and Lancashire. The region stretches 150 miles from north to south, from the border with Scotland down to the Dee estuary, and is bounded on the west by the Irish Sea and on the east by the Pennines.

It is a diverse region in many ways. Most of the population live in the cities, with approximately 60% in Liverpool and Manchester, but there are significant areas that are characterised by small towns and villages. In these rural areas, there is important landscape heritage, with a large area of the North West designated as the Lake District National Park. This area, along with the other National Parks crossing into the UU area and a larger number of sites designated for biodiversity importance, provide a wealth of natural heritage.

It is also acknowledged that the Drought Plan may have an impact upon some areas of Wales including the River Dee and Lake Vyrnwy, and information relating to North East Wales has been presented where relevant and available.

2.3.4 Biodiversity, Fauna and Flora

Baseline

Biodiversity is 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.

Drought management measures have the capacity to affect biodiversity, flora and fauna due to operational abstraction of water during times of water stress. The sensitivity of environmental features to drought management measures is site specific. A drought is transient, and the utilisation of drought management measures would only be for a limited period. Therefore, the duration of effects on sensitive features and the reversibility of the effects post drought are important considerations.

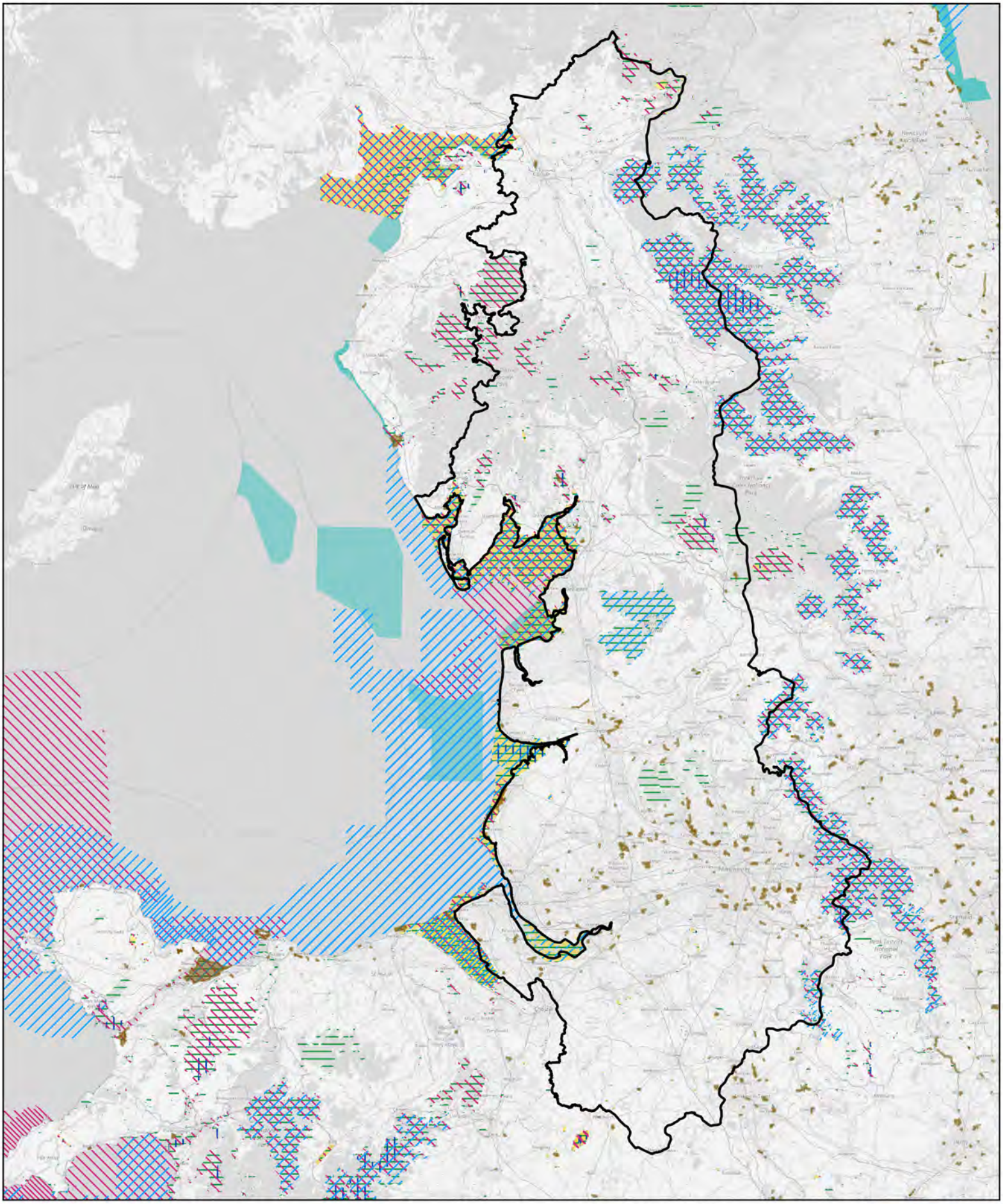
The North West of England is rich in areas of biodiversity interest, and it contains some of the most varied upland and lowland terrain in England. The North West Biodiversity Audit[14] shows that the region contains 31 out of the 37 different 'Broad Biodiversity Action Plan habitat classifications', one of the most diverse in the country. Wildlife indicators show that the region is also a haven for a significant number of species, with 135 rare species that are a UK or regional priority to protect.

The region also includes a number of sites that are designated at a European, national or local level as important for biodiversity, including:

- 1 National Park, and parts of 2 other National Parks
- 18 Ramsar Sites
- 14 Special Protection Areas (SPA)
- 42 Special Areas of Conservation (SAC)
- 451 Sites of Special Scientific Interest (SSSI)
- 4 Marine Conservation Zones (MCZ)
- 32 National Nature Reserves (NNR)
- 3 Areas of Outstanding Natural Beauty
- 154 Local Nature Reserves (LNR)

Figure 2.1 and Figure 2.2 show the location of these designated sites.

[14] North West Biodiversity (1999) *Wild About the North West: A Biodiversity Audit of North West England.*



Legend

- United Utilities Supply Area

Designated Sites

- Sites of Special Scientific Interest
- National Nature Reserves
- Special Areas of Conservation
- Special Protection Areas
- Local Nature Reserves
- Ramsar sites
- Marine Conservation Zones

N

Project title: SEA of United Utilities Drought Plan

Figure title: Designated Sites in North West England

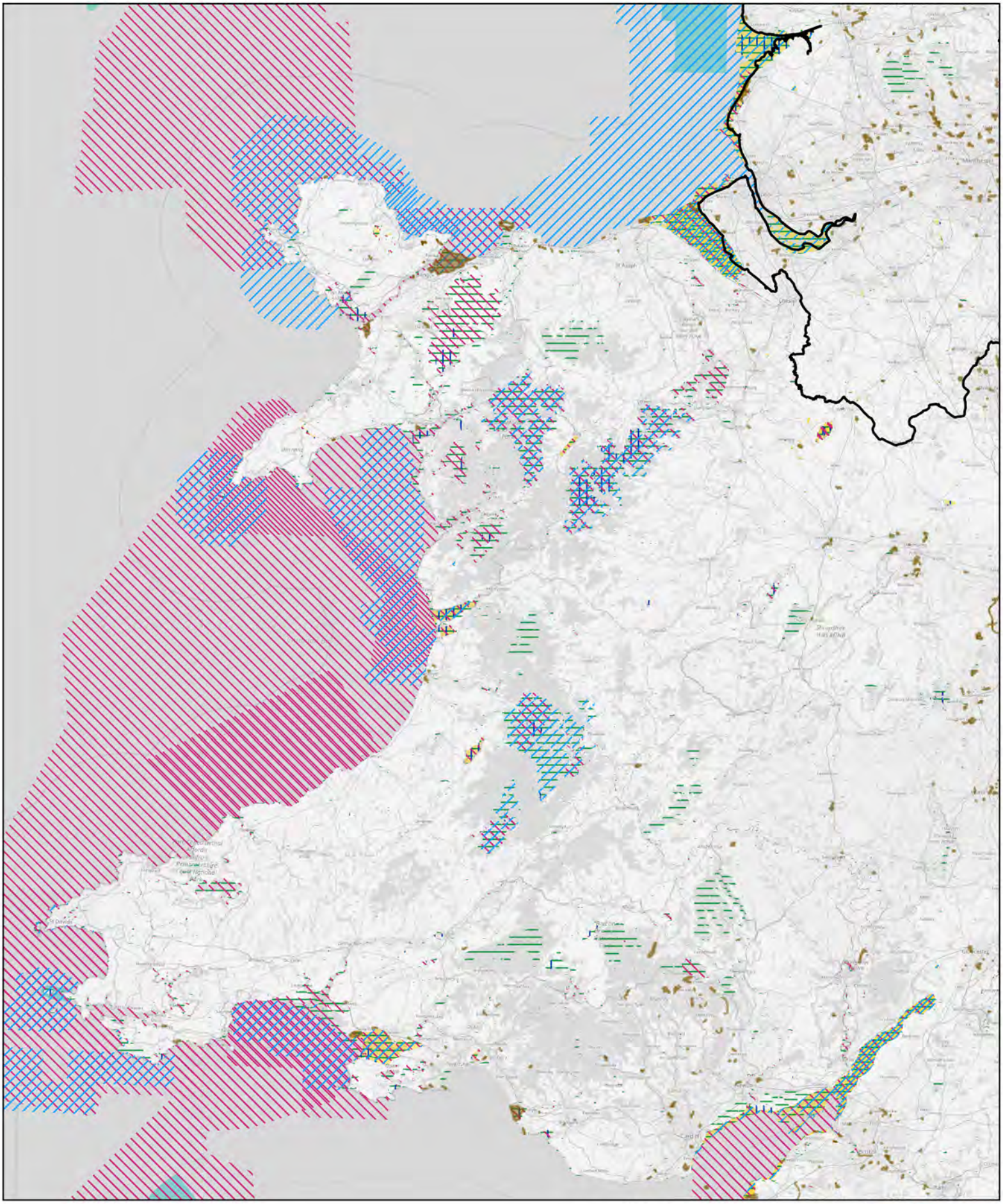
Date: March 2021

Ricardo Energy & Environment

United Utilities Water for the North West

Figure 2.1

0 10 20 km



Legend

- United Utilities Supply Area

Designated Sites

- Sites of Special Scientific Interest
- National Nature Reserves
- Special Areas of Conservation
- Special Protection Areas
- Local Nature Reserves
- Ramsar sites
- Marine Conservation Zones

N

Project title: SEA of United Utilities Drought Plan

Figure title: Designated Sites in Wales

Date: March 2021

Ricardo Energy & Environment

United Utilities Water for the North West

Figure 2.2

0 10 20 km

Information provided by the Natural England database indicates that an area of at least 21,300ha of freshwater, wetland and peatland habitat is designated in the North West, comprising over 100 SSSIs, with much of this area also designated as SPA, SAC and/or Ramsar Site. In Cumbria alone, there are 634km of SAC river systems, including within them approximately 2,500ha of component lakes. A total of 31 lakes and tarns in Cumbria are designated as open water SSSIs. In addition to these SSSIs designated specifically for their freshwater and wetland interest, there are numerous additional SSSIs and international sites with freshwater and wetland habitats present as an important component feature within the wider site.

The condition of habitats in the region has improved over recent years, and this is reflected in a gradual increase in woodland and farmland wild bird populations, one of the UK's key indicators for biodiversity. Improvements in inland and coastal water based habitats have also seen a noteworthy increase in numbers of otters, salmon and trout in some areas. However, the long term regional population trends for some of these species is still showing a general decline.

Across the country, the number of SSSIs identified as having a condition of 'favourable' or 'unfavourable recovering' is 92.79%[15]. The Biodiversity 2020 strategy[16] contains the UK Governments commitment to improving the condition of more SSSIs to favourable condition. There are a number of legislative instruments, including notably the Habitats Regulations and the UK's Restoring Sustainable Abstraction programme, which should contribute towards future improvements to the quality of habitats in the region.

To the west of UU's water supply area, the West Cheshire and North East Wales area contains some significant areas that are protected nationally or internationally. This includes the Clwydian Range Area of Outstanding Natural Beauty, a 35km long chain of hills rising between the Vale of Clwyd to the west and the Dee Estuary to the east. The area also has 8 SACs, 4 SPAs and 3 Ramsar Sites including the Dee Estuary, an area deemed of particular importance for its internationally recognised population of wintering waterfowl and waders. As shown in Figure 2.2, there are several designated sites in the vicinity of the Lake Vyrnwy drought option, including Berwyn SPA and SSSI, the Berwyn and South Clwyd Mountains SAC and Y Berwyn NNR. The River Dee and Bala Lake SAC is also in the vicinity of several of UU's drought options (although no drought options include abstraction from the River Dee). The River Dee flows from Llyn Tegid and is important for a range of species and habitats including migratory fish, particularly salmon, and three species of lamprey. The Dee is also important for its population of otters, which live and breed in the river and tributaries throughout the catchment, and for bullhead which are widespread throughout the river system.

There has been a dramatic increase in the number of non-native species arriving in Britain over recent decades, as well as in the numbers of invasive species being established[17]. There are approximately 2000 non-native species establish in Britain, with the majority in the terrestrial environment and smaller numbers in marine and freshwater environments. Non-native species cause significant adverse impacts, including out- competing native species and spreading disease[18]. The UK Government 2015 strategy on invasive non-native species builds on previous strategies to provide a framework for coordination action to prevent spread and work to eradicate species across the UK.

Future Baseline

It is not expected that many additional sites will be designated under international or national legislation throughout the course of the Drought Plan, therefore focus is instead placed on achieving the conservation objectives set for each of the existing sites. Current trends in data have shown that the condition of SSSIs in the region has increased over the recent years with 92.49% being in favourable or unfavourable recovering condition, above the national average of 93.17%[19]. Considerable effort is being made to ensure condition of SSSIs improve and condition assessments are undertaken regularly, as such, the condition of SSSIs in the region is likely to continue to improve.

[15] Natural England SSSI Condition Summary (2020) – www.naturalengland.org.uk
[16] Defra (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services.
[17] Defra (2012) Non-Native Species in Great Britain: establishment, detection and reporting to inform effective decision making.
[18] Defra (2015) The Great Britain Invasive Non-native Species Strategy
[19] Natural England SSSI Condition Summary (2019) – www.naturalengland.org.uk

In the Biodiversity Strategy 2020, the Government has outlined an aspiration to maintain at least 95% of SSSIs in favourable or unfavourable recovering condition[20], therefore a range of measures are included in the management plans to contribute towards either maintaining or improving the conditions of each site. Further to this, there are several legislative instruments, including the Habitats Regulations and the UK's Restoring Sustainable Abstraction programme, which should contribute towards future improvements to the quality of habitats in the region.

Trend data has also shown that incidents of otters are showing a gradual positive increase in numbers in recent years and this trend is expected to continue[21,22]. Salmon and eel stocks in the North West and North Wales have shown a decline over recent years, in common with a wider national trend[23,24,25]. The Environment Agency has prepared Eel Management Plans for every river catchment in England, which set out actions to halt and reverse the decline in the European eel stock.

Wild bird species indicators have shown an increase in the incidence of farmland and woodland bird species in the region. However, this is in contrast to national trends and as such, possible future trends for the region are difficult to predict or determine.

Climate change is anticipated to have an impact on wildlife in the future by exacerbating existing pressures such as changes to the timing of seasonal activity, and water scarcity. There is therefore a need to allow wildlife to adapt to climate change, in line with the Government's ambition for the reversal of the decline in native species and increase in wildlife-rich habitats[26].

Key Issues

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

- The need to protect, maintain or enhance biodiversity, ecological functions and biodiversity connectivity within UU's supply and source areas, particularly protected sites designated for nature conservation.
- The need to avoid activities likely to cause irreversible damage to natural heritage.
- The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors.
- The need to control the spread of Invasive Non-Native Species (INNS).
- The need to recognise the importance of allowing wildlife to adapt to climate change.

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

[20] Defra (2011) The Natural Choice: securing the value of nature. Natural Environment White Paper
[21] Environment Agency, *North West Environment Summary*
[22] Environment Agency, *North West Regional Contribution 2010-2015 Evidence Pack*
[23] Cefas (2017) *Salmon Stocks and Fisheries in England and Wales, 2016*
[24] Defra (2010), *Eel Management Plans for the United Kingdom: Dee River Basin District*
[25] Defra (2010), *Eel Management Plans for the United Kingdom: Northwest River Basin District*
[26] Defra (2019): Annexes to the Environment Bill. Available at: https://publications.parliament.uk/pa/bills/cbill/58-01/0009/Environment%20Bill%20IA%20ANNEXES.pdf

2.3.6 Population and Human Health

Baseline

Population

In 2016, the North West had a population of 7.2 million[27]. Until the early part of the 21st century, the total population was relatively stable, although declining in the Merseyside area. However, estimates show that the population is increasing, with an annual growth rate of 0.36%. The population of the North West is projected to reach 7.46 million by 2026, an increase of 3.4% from 2016.

The majority of its residents live in urban areas, with 2011 Census data suggesting that this equates to 89% of total residents. Population densities vary greatly: Across the North West the average population density was 500 people per square kilometre however this varies greatly within the region. The most densely populated area was Manchester with 4,726 people per square kilometre, followed by Liverpool with 4,395 people per square kilometre. In contrast, the district of Eden in Cumbria has the lowest population density in England with 24 people per square kilometre[28].

Household growth projections show that the number of households in the region is likely to increase from 3.08 million in 2016 to 3.42 million in 2041, an increase of approximately 11%[29]. The population and household figures also reflect the predicted fall in average household size, from 2.29 people in 2014, to 2.16 people in 2039. This is due to a growth of one-person households (an anticipated increase of 18.2% between 2014 and 2039), and in two person (with no children) households (an anticipated increase of 13.72% between 2014 and 2039).

Economy and Employment

The North West region has a large and diverse economy, and different areas within the region are facing different challenges. The North West's share of total UK gross value added (GVA) was 9.4% in 2015 and the growth in GVA from 2014 (at 3.0%) was the fastest for all regions in the UK[30].

The economic performance of sub-regional areas does vary significantly. The growth of areas such as Liverpool and Manchester has been good, and the general economic performance of other areas such as Cheshire and Lancashire has also been reasonable on the regional level. However, there does continue to be a degree of variation in economic performance within these sub-regions. Cumbria remains the poorest performing sub-region, particularly in areas such as Carlisle and Barrow-in-Furness which have suffered due to the loss of some of the manufacturing base and agriculture.

Gross value added is an indicator that has been developed to measure the contribution to the economy of individual firms, industries or sectors in the United Kingdom. The gross value added for the North West was £156,872 billion in 2015, which is approximately £21,867 per person[31]. This is 14.8% below the UK national average of £25,351 per person.

The average gross weekly earnings for full-time employees in the North West in 2019 was £529.6/week, which is below the national average of £569/week[32]. The unemployment rate in the region was around the national average in 2019 at 4.3%. This rate has dropped from 8.2% in 2013.

[27] Office for National Statistics (2018) *Subnational population projections for England: 2016-based,* Available at https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2016based
[28] Office for National Statistics (2018) Neighbourhood Statistics, Available at www.neighbourhood.statistics.gov.uk
[29] Office for National Statistics (2014) 2016-based Population Projections, Available at https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/2016basedhouseholdprojectionsinengland/2016basedhouseholdprojectionsinengland
[30] Office for National Statistics (2016) *Regional gross value added (income approach), UK: 1997 to 2015*, Available at https://www.ons.gov.uk/economy/grossvalueaddedgva/bulletins/regionalgrossvalueaddedincomeapproach/december2016
[31] Office for National Statistics (2016) *Regional gross value added (income approach), UK: 1997 to 2015*, Available at https://www.ons.gov.uk/economy/grossvalueaddedgva/bulletins/regionalgrossvalueaddedincomeapproach/december2016
[32] Office for National Statistics (2019) Labour Market Profile- North West

Education and Skills

The levels of qualifications in the region are reasonably representative of England and Wales (**Table 2.3**). A slightly higher than average percentage of people have qualifications equivalent to GCSE Grades A-C or above, although the proportion of people with degree level qualifications is slightly below the average, and those with no qualifications is above.

A key aspiration of the region's Economic Strategy is to reduce the levels of working-age people without qualifications.

Table 2.3: Level of qualifications

Qualifications (economically active population of working age)	North West	England and Wales
Degree or equivalent and above (NVQ 4 equivalent and above)	35.5%	39.2%
Higher education below degree level (NVQ3 equivalent)	17.9%	17.0%
GCSE A level or equivalent (NVQ2 equivalent)	17.4%	15.8%
GCSE grades A-C or equivalent (NVQ1 equivalent)	10.7%	10.4%
Other qualifications	6.1%	6.7%
No qualifications	9.1%	8.0%

Source: National Statistics, Annual Population Survey Dec 2018

The performance of school pupils in the region has been improving consistently in recent years[33]. In 2018, the percentage of Key Stage 1 pupils in the North West meeting the expected level of performance was 91%, falling just below the national average of 92%. In the same year, 64% of Key Stage 2 pupils in the North West, reached the expected standard in reading, writing and maths, in line with the national average. At GCSE level, in 2018 the average attainment 8 score for pupils in the North West was 45.7, slightly higher than the national average of 44.5.

Health and Deprivation

The Drought Plan has the potential to influence quality of life and human health through alterations to infrastructure and restrictions to water use. The Drought Plan sets out measures to ensure that essential water supplies can be maintained to all UU's customers, thereby protecting human health during drought conditions.

The health of the region is relatively poor compared to other regions and the national average. Census data from 2011 shows 79.3% of people in the region claimed to be in 'very good health' or 'good health', compared to a national average of 81.2%. In the same responses, 5.3% stated their health was 'bad', compared to a national average of 4.3%[34]. This is also reflected in activity rates, with only 33% of the population participating in 30 minutes of moderate activity 5 times a week[35]. The main urban conurbations in Merseyside, Manchester and Lancashire contained the highest proportion of people stating that their health was 'not good', with the lowest proportion in southern Cumbria.

The Office of National Statistics compiled the 'Indices of Multiple Deprivation' in 2019, which score and rank local authorities and smaller 'Super Output Areas' according to their performance against seven distinct categories of deprivation[36]. The indices show that there are some significant pockets of

[33] Department for Education (2018) Statistical collections.
[34] Office for National Statistics (2013), General Health I England and Wales: 2011 and comparison with 2001
[35] Sport England (2004) *North West Plan for Sports and Physical Activity*
[36] DCLG (2019) *English indices of deprivation 2019*, Available at https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

deprivation in all of the counties and districts in the region, with particularly large concentrations in and around the urban conurbations of Knowsley, Liverpool, Manchester and Blackpool.

Recreation and Tourism

Drought management measures have the capacity to affect areas with recreation value. Any potential construction requirements may include indirect impacts upon recreation and tourism through reduced access or loss of amenity value. Temporary water use restrictions (voluntary and statutory) may also adversely affect some recreational activities due to the suspension of external water uses such as the watering of sports grounds.

The North West offers a variety of opportunities for recreation and tourism, from the cultural offerings of the major cities to recreation in the region's National Parks and AONBs. Tourism also generates value for the region's economy. In 2018 13.28 million UK domestic overnight trips were made to the North West, amounting to spending of just over £2.6 billion[37]. The Environment Agency has also prepared a strategy for water-based recreation in the North West[38]. This report identifies priorities and initiatives which will help to address gaps in information or activity provision in the North West.

UU contributes to the recreational and tourism assets of the region through its ownership and management of land and water bodies, and through the impact of its activities on the wider natural environment. The company owns over 56,000 hectares of land, the majority of which is accessible to the public for recreational use[39]. Specifically there are opportunities for angling, water sports activities, walking and cycling trails as well as educational centres on nature reserves, reservoirs, and other land owned by UU. Furthermore, UU's water management has an impact on river and bathing water quality and thus can bear a direct influence on the tourist industry in the North West. Further challenges lie in the extent to which seasonal variation in tourist numbers can increase pressure on water resources during summer months, the period when demand is already typically highest.

Future Baseline

The population demographics of the region are likely to continue to change, particularly with an increasing ageing population, with reduced occupancy rates per household. Increased investment and economic development in the region may reduce outward migration in the long-term and therefore the population of the region is set to increase in line with national trends.

According to the latest published reports, the region has seen the largest decrease in the number of homeless households since 1998, and this trend is expected to continue. In 2013/2014, 7,907 households in the North West were reported as homeless[40]. It is also expected that house prices will continue to rise in line with national trends (according to the latest published reports).

In response to recent studies, access to the recreational resources, green spaces and the historic environment will have a greater bearing upon future planning41. An example of this is the expansion of Green Infrastructure Partnerships, with the intention to support the development of environmental infrastructure in England. Improvements to the quality of the water environment will present opportunities for expanding the tourism industry of the region.

Employment levels have gradually increased since 1992. Recent statistics have shown the region has seen a decrease in the unemployment rates and it is expected that this trend will continue.

[37] Visit Britain (2018) English Domestic Overnight Trips Summary
[38] Environment Agency (2010), Blue Horizons 2010-2015
[39] www.unitedutilities.com/corporate/about-us
[40] DCLG (2017) Live tables on homelessness, table 770. https://www.gov.uk/government/statistical-data-sets/live-tables-on-homelessness
[41] Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper

Key Issues

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

- The need to ensure water supplies remain affordable especially for deprived or vulnerable communities.
- The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures.
- The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other use such as agriculture.
- The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists for access to green infrastructure and the natural and historic environment, as well as protecting and enhancing recreational resources.
- 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.

The implications of a changing population on material assets and resource use, including water resources, are considered in Section 2.3.6 below.

2.3.7 Material Assets and Resource Use

Baseline

The quantity of water for public supply has reduced from approximately 2.5 billion litres per day in 1994/5 to 1.9 billion litres per day in 2018[42]. This decrease is largely attributed to a major leakage reduction programme and continuing fall in use by industry. Of this, around 70% was abstracted from the North West of England, with the remainder transferred from mid and North East Wales[43]. Just under half of all water is used by households, with a quarter used by businesses and a further quarter lost through leakage.

In 2018/2019, the regional average household consumption was 144 litres/person/day, a 1% increase on the previous year[44]. Whilst usage of water per person is low in comparison to many other regions, this still exceeds the Government target of 130 litres/person/day by 2030[45]. In UU's Final WRMP 2019 they project household consumption to fall to 110 litres/person/day by 2039/40.

As well as public water supply, some water users abstract water directly, without treatment by water companies. The data in **Table 2.4** shows that significantly less than half of all water abstracted in the North West is accounted for by public water supply, with the majority contributing towards electricity supply and other industry.

[42] www.unitedutilities.com/corporate/about-us
[43] United Utilities (2019) Final Water Resource Management Plan.
[44] United Utilities 'Water to your tap' accessed September 2019 at https://www.unitedutilities.com/corporate/about-us/performance/discover-water/water-to-your-tap/
[45] Defra (2008) Future Water; the Governments Water Strategy for England. February 2008.

Table 2.4: Water use

Estimated licensed and actual abstractions from all surface and groundwater sources by purpose (2017)	Million cubic meters North West	Million cubic litres England
Public water supply	689	5,332
Agriculture (including spray irrigation)	5	109
Electricity supply industry	3130	8131
Other industry	177	1799
Fish farming, cress growing, amenity ponds	13	888
Private water supply	0	10
Other	2	32

Resource Use and Waste

The North West is a major producer and consumer of energy. Total energy consumption in the region during 2016 was 14 million tonnes of oil equivalent (mtoe) (about 11% of the total UK figure), and it is expected that this will continue to increase in the future[46]. **Table 2.5** shows that the proportional use of total energy in the region used for industry and commercial uses is slightly above the UK average, whilst domestic and transport energy use is below the average for the UK. Energy consumption by type is fairly representative of national trends, with most energy coming from natural gas (38.5%) and petroleum (36.7%)**.** Renewable energy is a burgeoning field in the region with 16% of sites generating renewable energy in England found in the North West, more than any other region. In 2009, the North West generated more electricity from wind and waves (904 gigawatt hours) than any other region, contributing towards 30% of the total for England[47].

Table 2.5: North West energy demand by sector (2015)

Energy demand by sector	North West	UK
Industry and Commercial	36.5%	35.3%
Domestic	30.9%	31.3%
Transport	28.7%	30.7%

Source: Department for Business, Energy & Industrial Strategy. Regional Energy Consumption Statistics 2016

During 2016/17 3.56 million tonnes of waste (from all sources) was produced in the North West[48], which comprises 13.5% of England's total waste. Figures produced by Defra from 2016[49] show that the total amount of household waste collected by local authorities has increased by 3.6% between 2012 and 2016 to 22,770 thousand tonnes of waste per year. The same study also indicated that rates of recycling across the region have risen significantly from 7.4% in 2000/1 to 46.0% in 2016/17. Furthermore, the amount of municipal waste sent to landfill has fallen from 90% to 24.3% over the same period.

The process of water abstraction, treatment and distribution also consumes a significant amount of resources. This includes direct use of resources such as chemicals to control water quality, and indirect use through the requirement for energy for pumping and treatment.

[46] Department for Business, Energy & Industrial Strategy (2016) Regional Energy Consumption Statistics
[47] ONS (2011) Portrait of the North West
[48] Defra (2017 Statistics on waste managed by local authorities in England in 2016/2017
[49] Defra (2012) Local Authority collected waste statistics – England 2010-2015

Housing

In 2017, there were 3.27 million dwellings in the North West, which represents 13.6% of England's housing stock[50]. The Regional Spatial Strategy[51] for the North West projects an annual increase in dwelling of 22,844 until 2021. This projection is based upon providing sufficient dwellings to meet local need as well as allowing for economic growth and regeneration, particularly in urban areas.

A study conducted by the Ministry of Housing, Communities & Local Government suggests that the quality of the housing stock in the North West is worse than national averages. In 2017, 638,000 (19.5%) households were classified as 'unfit', in comparison to the national average of 18.8%. The tenure of dwellings in the North West is divided as shown in **Table 2.6**. This demonstrates a slightly above average level of residences leased from a Registered Social Landlord, and a slightly below average amount of owner occupied and privately rented residences.

Table 2.6: Dwellings in the North West by tenure

Dwellings by tenure		
Owner Occupied		63%
Private Rented		20%
Social Rented	Local Authority	7%
	Housing Association	10%

Source: Ministry of Housing, Communities & Local Government, English Housing Survey headline report 2016 to 2017.

Future Baseline

Energy demand in the region has increased significantly in recent years and is expected to continue to rise in the future. The Government has committed to meeting a target of 15% of the UK's energy demand from renewable sources by 2020[52].

Increased kerbside collection schemes are helping, and will continue to improve recycling rates across the region.

There are many factors to be considered when predicting future water demand. Population growth and changes in household size will mean that more houses are needed in areas where abstraction is not currently sustainable. Climate change is expected to exacerbate the situation further, as rising temperatures and greater seasonal variation in precipitation are likely to alter the public demand for water[53]. The Environment Agency suggest that demand could increase by as much as 33% or conversely decrease by 30% relative to current levels[54].

The Environment Agency estimate that water use in England is approximately 150 litres/person/day, slightly above the average rate for the North West of 144 litres/person/day. For 2030, the EA aspire for per capita consumption to decrease to 120 litres/person/day, dependent on technological developments and innovation.

As described in Section 1.3.2, leakage control is a key priority of UU's WRMP and Drought Plan. Leakage detection and repair activities will be enhanced during a period of severe water shortage, as set out in the 2018 Drought Plan. The predicted future baseline for leakage control is outlined in UU's WRMP 2019, with UU proposing leakage reductions of 20% by 2025, and just over 40% by 2045.

[50] Ministry of Housing, Communities & Local Government, English Housing Survey 2017: stock condition
[51] Government Office for the North West(2008), The North West of England Plan Regional Spatial Strategy to 2021
[52] DECC (2013) UK Renewable energy roadmap: Update
[53] DEFRA (2011) Future Water- The Government's water strategy for England
[54] Environment Agency (2001), Water Resources for the Future - Northwest

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.
- The need to continue to encourage more efficient water use by consumers.

2.3.8 Water

Baseline

Rivers, Lakes, Groundwater and Flooding

UU sources water from both England and Wales. Lake Vyrnwy is the only drought option in Wales in UU's Drought Plan. There are no drought options which directly use the River Dee within UU's Drought Plan, although it is acknowledged that a number of groundwater drought options are located in England within or in the vicinity of the River Dee catchment which straddles the border of England and Wales. Although it is acknowledged that other sites within Wales are utilised by UU, the SEA Environmental Report focuses on the Drought Plan and the drought options contained therein. As such, the issue of UU's wider operations in Wales is considered a water resources issue and not an issue for drought planning specifically.

In 2017, 1.5 billion m^3 of water were abstracted from non-tidal surface waters and ground waters in the North West Environment Agency Region per day[55]. Around 85% of the region's water supply is abstracted from rivers or collected and stored in upland reservoirs[56] (UU's water supply system is described in Section 1.3, and water use summarised in Section 2.3.6). 15% of public water supply in the North West is provided by groundwater. This source is particularly valuable during times of surface water shortages and as such is a key resource to the region[57]. We are awaiting information from the Environment Agency to allow risk deterioration of the groundwater bodies to be assessed within the region.

Water abstraction may impact hydrologically sensitive nationally and internationally designated sites and/or influence wider biodiversity. Water abstraction may also impact landscape and visual amenity of landscapes, including those designated as AONBs or as part of National Parks. Lake Vyrnwy, the River Dee, and other freshwater-dependent habitats in North East Wales are of importance for biodiversity and it is noted that many of these habitats are internationally or nationally designated sites for nature conservation.

The North West of England region has many lakes, particularly in Cumbria, which provide a valuable source of freshwater for agricultural, domestic and industrial uses. They also provide amenity value and opportunities for water sports recreation including boating and angling. The region's lakes, rivers and other freshwater-dependent habitats are of importance for biodiversity and many of these habitats are internationally or nationally designated sites for nature conservation.

The high proportion of upland landscape in the region means many of the rivers and streams in the North West of England are short and steep and often flow over impermeable rock, which results in large variations in flow especially during periods of heavy rain. Research conducted by the Environment Agency in 2013 identified that throughout the North West there were 77,313 individuals deemed to be at either high or medium risk from flooding, and a further 15,469 non-residential properties at the same

[55] Defra (2019) Estimated abstractions from non tidal surface waters by purpose and Environment Agency/NRW charge region: 2000 to 2017
[56] Defra, North West England Rural Development Plan
[57] British Geological Survey (2015), www.bgs.ac.uk/research/groundwater/waterresources/GroundwaterInUK

level of risk[58]. Following regional flooding in 2015, the Environment Agency has committed to investing in flood defence programmes covering the North West of England, including spending of £46 million towards a flood defence scheme along the River Irwell to better protect nearly 1,000 homes[59]. The Government has further recognised the importance of investing in flood risk and coastal management by committing £2.6 billion investment from 2015 to 2051 to fund 1,500 flood defences, with the aim to improve protection to 300,000 homes. Climate change may have a significant effect upon future flood risk in the region.

In their most recent Flood and Coastal Erosion Risk Report, Natural Resources Wales reported that there were 208,500 properties at risk of flooding from rivers and the sea in Wales in 2014[60]. Between 2016 and 2017, £55 million was put aside by the Welsh government to reduce risk from flooding and maintain existing assets, this was anticipated to reduce risk to over 3,500 properties.

Water Quality

The quality of river waters in the region has improved in recent years, and this is noteworthy in rivers such as the Mersey which are now able to support fish stocks along its entire length for the first time in a number of years. The ecological standard of rivers, according to the Environment Agency classification status published in River Basin Management Plans (2015)[61], is shown in **Table 2.7**, which shows that overall ecological status for the north west region is above national averages and comparative to other river basin districts.

Table 2.7: Overall Ecological Status of Surface Waterbodies

River Water Quality	North West	UK	Dee River Basin District	Severn River Basin District
Rivers classified as 'Good' or 'High'	25.8%	30.8%	33.8%	20.8%
Rivers classified as 'Moderate', 'Poor' or 'Bad'	74.2%	69.1%	66.2%	79.1%

Source: European Environment Agency (2018) Ecological Status of surface water bodies accessed at https://www.eea.europa.eu/themes/water/european-waters/water-quality-and-water-assessment/water-assessments/ecological-status-of-surface-water-bodies

The Environment Agency's 2015 River Basin Management Plan for the North West river basin district identifies several challenges to continued improvement in water quality across the region. These include:

- physical modifications;
- pollution form waste water;
- pollution from towns and cities;
- changes to the natural flow and level of water;
- pollution from rural areas;
- pollution from abandoned mines.

2018 mandatory results for bathing waters in the UK are presented in **Table 2.8** below.

[58] Environment Agency (2013) Risk of Flooding from Rivers and Sea- North West River Basin District
[59] Gov.uk (2018) '£40m extra funding to boost regeneration and better protect thousands of homes against flooding'
[60] Natural Resources Wales (2017) Flood and coastal erosion risk management in Wales, 2014-2016
[61] Environment Agency (2016) River Basin Management Plans- Cycle 2

Table 2.8: Mandatory Compliance Results for Bathing Waters in the UK

	North West			England			Wales		
	Pass	Fail	Compliance	Pass	Fail	Compliance	Pass	Fail	Compliance
Bathing Waters	29	1	**96.7%**	411	9	**97.9%**	104	0	**100%**

Future Baseline

The quality of water in rivers and seas in the region has been gradually improving over recent years. With current targets and measures in place, this trend is expected to continue.

However, climate change is anticipated to adversely impact upon surface and groundwater resources over the longer term, with some modest impacts potentially arising over the medium term to 2040. The Catchment Flood Management Plans[62] anticipate that the North West will be subject to more intense weather events in future, including warmer summers and wetter winters. This will increase the risk of storms and flooding. Climate change may also result in the alterations to the frequency and duration of drought events. Increases in the frequency and duration of drought events could have knock-on effects on biodiversity, both directly and through cumulative impacts such as, for example, reduced dilution in areas of poor water quality.

Key Issues

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

The need to further improve the quality of the region's river, estuarine and coastal water quality, particularly the biological quality of rivers.

- The need to further improve the quality of the region's river, estuarine and coastal waters taking into account WFD objectives.
- The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives.
- The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface water and groundwaters.
- The need to ensure sustainable abstraction to protect the water environment.
- The need to ensure that people understand the value of water.

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

[62] Environment Agency (2009) Catchment Flood Management Plans Collection

2.3.9 Soil Geology and Land Use

Baseline

There is a great diversity in the composition of the geology across the region. The majority of the lowland Cheshire plains, Merseyside and western Lancashire are dominated by Triassic mudstone and sandstone. The uplands of Cumbria are partly made up of volcanic igneous rock from the Devonian period. Moving eastwards towards the Yorkshire Dales, the geology becomes dominated by distinctive carboniferous limestone, and south into Lancashire millstone grit and coal becomes abundant. The north eastern area of Wales is also made up of significant areas of carboniferous limestone. The River Dee catchment area consists of ancient Pre-Cambrian metamorphosed sediments of the Moine series and, to the west, the Dalradian series brings mixed acid-basic soils with some limestone. The variety of underlying geology in the region is reflected in the region's soils, the agricultural value of which varies across the region.

The North West is predominantly rural with four fifths of land in the region used for agriculture[63]. Of the agricultural land in the North West the majority is designated as permanent pasture that is more than 5 years old. Arable farming is confined mostly to the Lancashire Plain and Mersey Basin.

Livestock farming is the major agricultural use of the uplands of the region and involves extensive grazing of semi-natural vegetation.

The Agricultural Land Classification System developed by Defra provides a method for assessing the quality of farmland, principally for the use in planning. The system divides the quality of land into five categories as well as non-agricultural and urban; the regional data is summarised in **Table 2.9** and is shown on **Figure 2.3**. The 'best and most versatile land' is generally defined as the agricultural land which falls into Grades 1, 2 and 3a. The quality of the agricultural land in the region is significantly below the national average, with 44.7% of land being classed as 'Poor' or 'Very Poor', compared to a national average of 22.5%. This reflects the large proportion of upland area which generally has low agricultural quality due to exposure and poor soil cover. There is also an above average proportion of urban land.

Table 2.9: Agricultural land classification

Agricultural Land Grade (2005 data)	North West	England
Grade 1- Excellent	2.1%	2.7%
Grade 2- Very Good	5.2%	14.2%
Grade 3- Good/ Moderate	34.0%	48.2%
Grade 4- Poor	19.5%	14.1%
Grade 5- Very Poor	25.2%	8.4%
Non agricultural	3.5%	5.0%
Urban	10.5%	7.3%

The regional and national statistics were produced prior to Grade 3 being divided into 2 sub-categories – so only figures for Grade 3 are available. (Statistics source: http://www.defra.gov.uk/rds/lgmt/docs/ALC-Stats071105.pdf)

The region contains a high proportion of land protected for its national importance. In 2008, 18% of the region was designated as National Park (largely comprising the Lake District), and 11% of the region was designated as an AONB[64]. However, in the same year, over 18% of the region's total area was classified as 'derelict, underused or neglected', the largest proportion in England. The region has a generally lower than average tree coverage at approximately 6% of the total land area, but does have the largest area of community forest in England comprising the Mersey and Red Rose Forests.

[63] Natural England (2011) State of the natural environment in the North West
[64] Natural England (2008), *State of the Natural Environment in the North West.*

Future Baseline

The vision of Defra's Soils Strategy for England[65] 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. 'Water for Life'[66], the Government's white paper for water and the environment, outlines the Government's work towards improving water efficiency within agricultural practices in order to reduce water consumption.

The Environment Agency has been researching and developing methods to improve water efficiency in agricultural practices in order to help reduce water consumption.

There are a number of Environmentally Sensitive Areas (ESAs) in the region including the Lake District and parts of the North Peak, the South West Peak and the Pennine Dales. The ESA Scheme is designed to protect and enhance the environment by offering payments to landowners and occupiers in these areas to adopt environmentally beneficial agricultural practices[67]. The scheme has now been superseded by the Environmental Stewardship Scheme. Continued development of this scheme is expected to see an improvement in land use in the future.

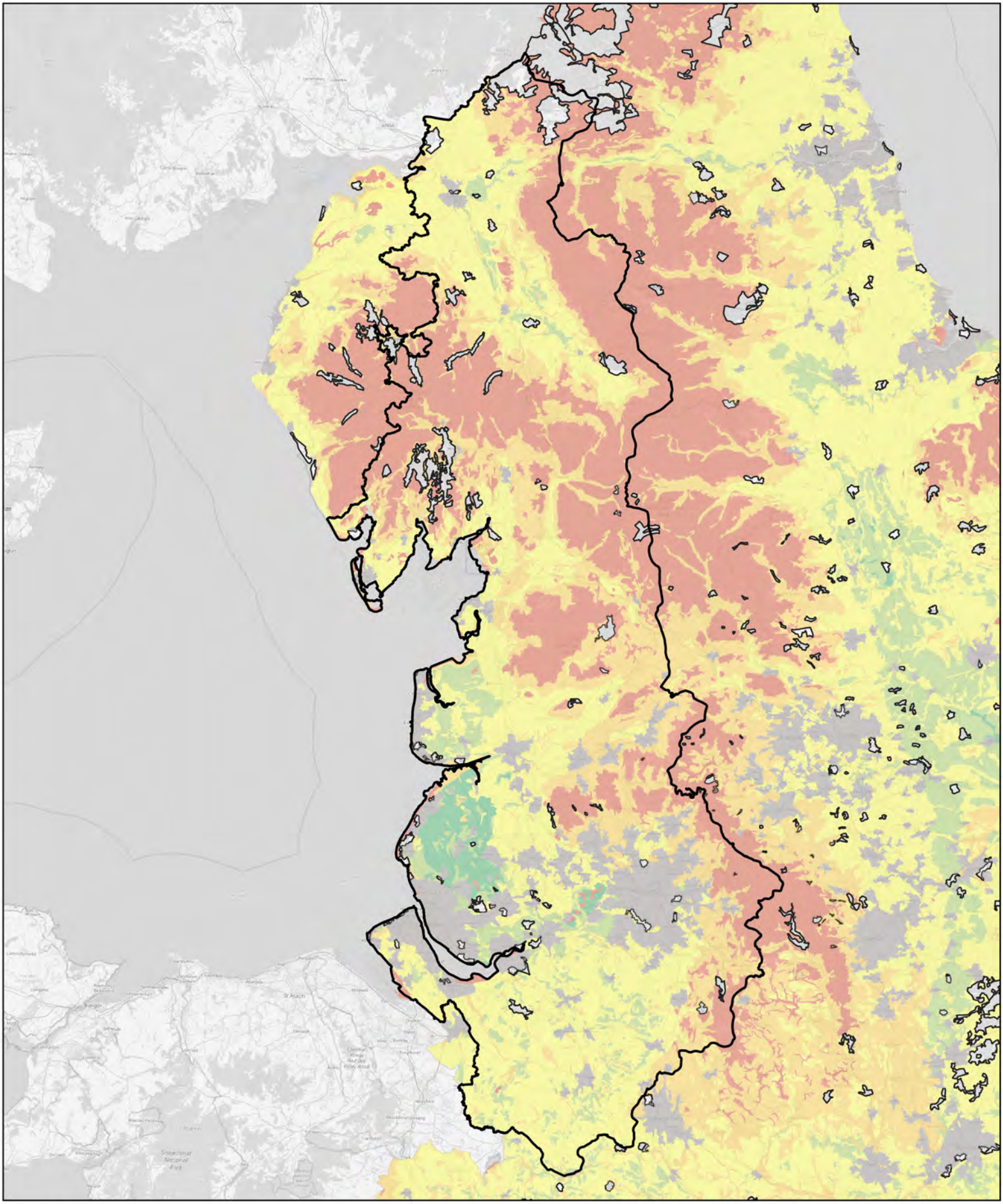
The National Policy Planning Framework (NPPF), commissioned by the Ministry of Housing, Communities and Local Government, aims to encourage the effective use of land by reusing land that has been previously developed (brownfield), provided that it is not of high environmental value. The NPPF also places great importance with respect to Green Belt policy, the aim of which is to prevent urban sprawl by keeping land permanently open. The North West has 3,407 ha of land designated as brownfield, comprising approximately 12% of total brownfield site in the UK[68].

Key Issues

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

- The need to sustainably manage and/or improve the quality of agricultural land in the region.
- The need to protect the natural beauty of the region's national parks and areas of natural beauty, and encourage the considerate growth of native woodland and forest in the region.
- 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).

[65] Defra (2009) Safeguarding our Soils: A Strategy for England
[66] Defra (2011) Water for Life
[67] Defra (2005), "*Rural Development Programme for England*"
[68] Campaign to Protect Rural England (2018) State of Brownfield



Legend

- United Utilities Supply Area

Agricultural Land Classification

- Non-Agricultural
- Urban
- Grade 1 (Excellent)
- Grade 2
- Grade 3
- Grade 4
- Grade 5

N

Project title: SEA of United Utilities Drought Plan

Figure title: Agricultural Land Classifications

Date: March 2021

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Figure 2.3

0 10 20 km

2.3.10 Air and Climate

Baseline

Drought management measures may involve the operation of abstraction and treatment facilities at a greater level of intensity and/or in locations where such operations do not normally take place, with the potential for negative effects, although generally only in the short term.

Since 1990, net CO_2 emissions have decreased by 38 percent to 367 (million tonnes) as of 2017. Air quality in the North West has improved in recent years, with emissions from industrial sites and processes being controlled effectively.

There are eight key industrial pollutants which are monitored on regulated premises. Of these, seven have shown some significant reductions and only carbon monoxide levels have increased. The region's air quality is now most significantly affected by the increasing amount of traffic. Between 1993 and 2018 the North West has seen a 23% increase in motor vehicle traffic[69], which causes some local air pollution issues, particularly in urban areas and at peak times. Nationally, road transport has contributed towards 25% of the UK's CO_2 emissions in 2017.

The key contributors to climate change are greenhouse gases such as carbon dioxide. In the North West there have been significant reductions in CO_2 emissions, falling from 59.9 million tonnes in 2005 to 39.4 million tonnes in 2017, a 41% reduction[70]. Of these emissions it is estimated that 37.8% came from industrial and commercial premises, 27.9% from domestic sources and 34.9% from road transport. In Wales, CO_2 emissions have reduced from 33 million tonnes in 2005 to 24.7 million tonnes in 2017. In Powys, the local authority area surrounding Lake Vyrnwy, there has been a 22.53% per capita reduction in CO_2 emissions from 2005 to 2017.

UU is a large user of energy due to the energy needed to treat and pump water. Between 2018 and 2019, 167,856 tonnes of CO_2 were produced by UU, with around 21% of its total energy use derived from renewable sources[71].UU anticipate their emissions of CO2 will continue to fall as a reflection of increased renewable energy generation and decreases in carbon content of the UK's energy supply. By 2035 UU aim to reduce their greenhouse gas emissions by 60%.

Future Baseline

The effects of climate change are potentially some of the most significant environmental problems facing the region. The climate in the North West is set to get warmer during the summer and wetter during the winter with periods of more intense weather events. These effects could include increased variability in precipitation and droughts, increased sea levels and a higher risk of flooding in the future. Environment Agency predictions[72] state that by 2080, average temperatures may increase by 4-5 degrees Celsius and there could be a 90% reduction in snowfall. Winter rainfall may increase by as much as 30% but in contrast, summer rainfall may decrease by 50% compared to current patterns. Sea levels could rise by 67cm and the extreme weather patterns experienced today could become the norm by 2080.

Government and international targets, revised recently by the Paris Agreement (2016), indicate significant cuts in greenhouse gas emissions will take place by 2027. The UK is currently projected to meet its first three legislated carbon budget targets (until 2022)[73]. Objectives are being achieved for many air pollutants (lead, benzene, 1,3-butadiene and carbon monoxide (CO)). However, measurements show that long-term reducing trends for NO_2 and PM_{10} are flattening or even reversing at a number of locations, despite current policy measures.

[69] Department for Transport Statistics (2018), Road Traffic Estimates: Great Britain 2018
[70] Department for Business, Energy & Industrial Strategy (2019) 2005 to 2017 UK local and regional CO2 emissions: statistical summary
[71] United Utilities (2019): Director's Report, Energy and Carbon
[72] Environment Agency, State of the Environment Report 2018
[73] DECC (2015) Updated energy and emissions projections 2015
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501292/eepReport2015_160205.pdf

The National Energy and Climate Plan contains updated climate change targets, with an aspiration to reduce emissions by 80% by 2050[74]. To achieve this ambition, emissions from buildings must reduce to almost zero and industrial processes will need to adapt, both significant to UU's operations.

Key Issues

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

- The need to continue to reduce air pollutant and greenhouse emissions arising from industrial processes.
- The need to reduce the use of the car, and to reduce localised air pollution and greenhouse gas emissions arising from transport.
- The need to limit air emissions to comply with air quality standards.
- The need to take into account, and where possible mitigate for, the potential effects of climate change.
- The need to consider and assess potential future changes in surface water flows resulting from climate change.
- The need to adapt to the impacts of climate change for example through sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities of climate change.

2.3.11 Archaeology and Cultural Heritage

Baseline

Implementation of drought management measures 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, pollution and land-use practices.

The cultural and historic heritage of the region is largely dominated by its contribution towards the UK's industrial history, largely due to its wealth of natural resources and good connections via sea and inland waters to other areas of the UK and other countries. Appreciation of the North West's industrial heritage is marked through the conservation of buildings dating from the Industrial Revolution in the cities of Manchester, Salford and Liverpool. Liverpool's commercial centre and waterfront, and parts of Manchester and Salford are all candidates for nomination for World Heritage status.

Conversely, the majority of the region's ancient historical and archaeological heritage occurs in the more rural areas, which contain important sites including St Bees Heritage Coastline and those designated as part of the Frontiers of the Roman Empire UNESCO World Heritage Site (Hadrian's Wall). The heritage and cultural value of the region's diverse range of landscapes are also deemed of importance, with three National Parks or parts of National Parks located within the region. The cultural heritage of the North West is recognised internationally through the designation of four UNESCO World Heritage Sites; Hadrian's Wall, The Lake District National Park, Liverpool's Maritime Mercantile City and, as of 2019, the Jodrell Bank Observatory. The North East Wales area is also particularly noted for its Iron Age hill forts, particularly along the Clwydian Range.

The region's paleoenvironmental deposits also serve as important baseline features. These contain important records of past human activities as well as climate change. Most of this evidence is organic and only survives in favourable conditions. If water levels are reduced, e.g. through surface water

[74] The UK's draft National Energy and Climate Plan (NECP)

abstraction, these delicate materials are highly susceptible to decay and destruction. Such baseline information is site specific and no general trends or regional spatial variability is available.

Historic England, a body funded by the Department for Digital, Culture, Media and Sport, collects data on heritage at risk. As of 2018 there were 419 assets listed as at risk within the North West, encompassing buildings and structures, archaeological sites and conservation areas.

Future Baseline

There are no significant trends relating to archaeology or cultural heritage, therefore, predicting future changes is extremely difficult. The Rural Development Programme has identified that many of the region's cultural heritage sites are endangered and there are particular concerns regarding buildings on upland sites.

Key Issues

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

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

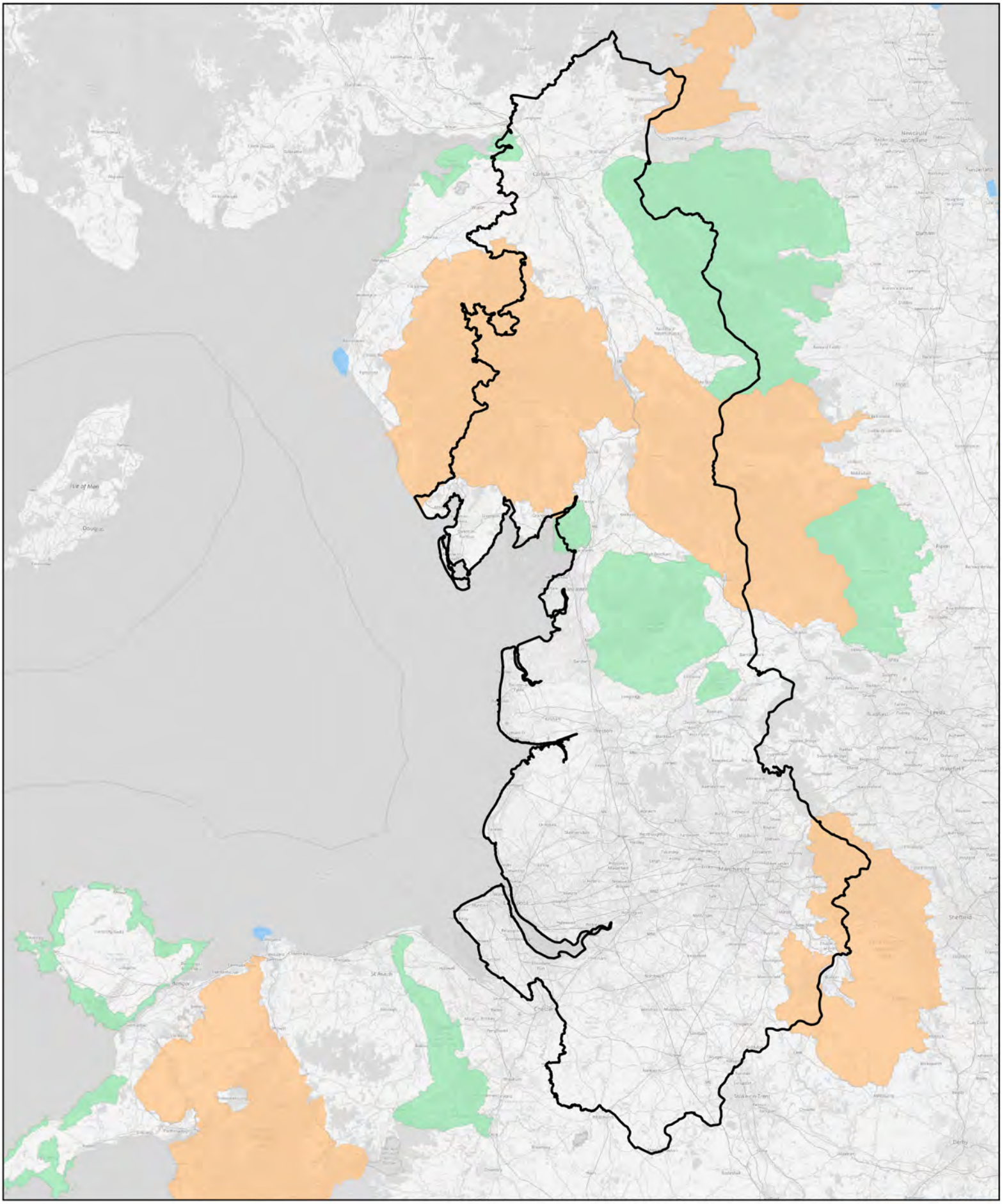
2.3.12 Landscape and Visual Amenity

Baseline

Implementation of drought plan measures has the potential to influence landscape and visual amenity, beyond the impacts that would occur as a result of the drought alone.

The landscape of the North West of England is some of the most diverse in the country, containing many distinct 'Landscape Character Area' types which have been defined by Natural England. Although the region is generally low lying, it also contains some of the most striking upland landscapes in England, particularly within the Lake District National Park.

The coastal landscape in the North West contains remnants of the region's industrial history, in particular the Liverpool and Merseyside docklands, as well as having protected areas of Heritage Coastline around St Bee's Head. A Heritage Coast is a section of coast exceeding one mile in length that is of exceptionally fine scenic quality, substantially undeveloped and containing features of special significance and interest. They are agreed between Natural England and the local authority. The national distribution of heritage coasts is far from even and within UU's operating area there is just 1% of the UK's Heritage Coastline, located around St. Bee's Head. National Parks, AONBs and Heritage Coastline are shown in **Figure 2.4**.



Legend

United Utilities Supply Area

Landscape Character Designations

- Heritage Coasts
- National Parks
- Areas of Outstanding Natural Beauty

N

Project title:
SEA of United Utilities Drought Plan

Figure title:
Landscape Character Designations in North West England and North Wales

Date: March 2021

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United Utilities
Water for the North West

Figure 2.4

0 10 20 km

The region contains the Lake District National Park in Cumbria, which is a striking combination of upland fells, complex river systems and lakes and contains a large variety of species and habitats. Two other National Parks also fall partly within the region – the Yorkshire Dales and the Peak District. In 2016, the Lake District and the Yorkshire Dales National Parks were extended by 3% and 24% respectively. The park boundaries are now within touching distance on either side of the M6 motorway, creating a band of protected land across the North West. The region has three AONBs which lie wholly or mainly in the region (Solway Coast, Arnside and Silverdale, Forest of Bowland). The North Pennines AONB also straddles Cumbria's eastern border.

The region has been mapped for tranquillity levels as part of a national project carried out by the Campaign to Protect Rural England[75]. Natural England have also developed national indicators of how the countryside is changing, to understand how and where that change occurred, which is referred to as the Countryside Quality Counts project[76].

There are 96,171 hectares of forest in the North West, representing 6.8% of the region's total area. The majority of the forest in the region comprises broadleaved woodland (43.7% of the total) and coniferous woodland (36.7% of the total)[77]. There are also some significant areas of semi-natural and relict ancient woodland, particularly in Cumbria and the Mersey and Red Rose forests comprise the largest area of community forest in the country.

Snowdonia National Park and the Clwydian Range AONB are the significant designated landscape sites within the region of Lake Vyrnwy and the River Dee.

Future Baseline

It is envisaged that landscape and designated sites will be maintained and enhanced for the enjoyment of the public.

Defra has set a number of future targets in order to see significant expansion and restoration of a number of priority woodland habitats. These include Upland Oak, Upland Mixed Ash, Wet Woods and Beech. Furthermore, the Government has committed to increasing nationwide woodland cover by 2% before 2060[78].

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 in the visual amenity of the North West.

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 national parks, coastline, other areas of natural beauty, including undesignated landscapes and encourage the growth of woodland and forest in the region.

2.3.13 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. Note that inter-relationships and synergistic effects within each SEA topic will be considered and discussed within the assessment for each topic.

[75] http://www.cpre.org.uk/what-we-do/countryside/tranquil-places. Accessed on 13 February 2013,
[76] http://www.naturalengland.org.uk/ourwork/landscape/englands/character/cqc/default.aspx. Accessed on 13 February 2013.
[77] Forestry Commission, *National Inventory of the North West*
[78] *Forestry in England: Seeing the wood for the trees (2017) Accessed at: www.parliament.uk*

Key Issues

The key sustainability issue arising is:

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

2.4 Summary of Key Issues

A summary of the key issues identified by the policies, plans and programmes review (Section 2.2) and the baseline data review (Section 2.3) is presented in **Table 2.10**. These key issues have been used to develop SEA objectives in Section 3.

Table 2.10: Key sustainability issues arising from the baseline assessment

Topics	The key sustainability issues arising from the baseline assessment
Biodiversity, flora and fauna	• The need to protect, maintain or enhance biodiversity, ecological functions and biodiversity connectivity within UU's supply and source areas, particularly protected sites designated for nature conservation. • The need to avoid activities likely to cause irreversible damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors. • The need to control the spread of Invasive Non-Native Species (INNS). • The need to recognise the importance of allowing wildlife to adapt to climate change. • The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.
Population and human health	• The need to ensure water supplies remain affordable especially for deprived or vulnerable communities. • The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures. • The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other use such as agriculture. • The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists for access to green infrastructure and the natural and historic environment, as well as protecting and enhancing recreational resources. • 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.

Topics	The key sustainability issues arising from the baseline assessment
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. • The need to continue to encourage more efficient water use by consumers.
Water	• The need to further improve the quality of the region's river, estuarine and coastal waters taking into account WFD objectives. • The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives. • The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface water and groundwaters. • The need to ensure sustainable abstraction to protect the water environment. • The need to ensure that people understand the value of water.
Soil, geology and land use	• The need to sustainably manage and/or improve the quality of agricultural land in the region. • The need to protect the natural beauty of the region's national parks and areas of natural beauty, and encourage the considerate growth of native woodland and forest in the region. • 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).
Air and climate	• The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards. • The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term. • The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities of climate change.
Archaeology and cultural heritage	• The need to protect or enhance sites of archaeological importance and cultural heritage interest, and their setting, particularly those which are sensitive to the water environment. • The need to protect water-dependent heritage sites during drought conditions.

Topics	The key sustainability issues arising from the baseline assessment
Landscape and visual amenity	• The need to protect and improve the natural beauty of the region's national parks, coastline and other areas of natural beauty, and encourage the growth of woodland and forest in the region.
Inter-relationships	• The need to consider inter-relationships between topics

3 Methodology

3.1 Introduction

This section describes the methodology that has been used to undertake the SEA of the drought options in UU's Revised Draft Drought Plan 2022.

What the SEA Regulations require:

According to Regulation 12:

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

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

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

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

3.2 Assessment Methodology and SEA Framework

The environmental assessments of the drought options have been 'objectives-led', the overall findings of which describe the extent to which these objectives have been met. 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 2.3).

An assessment framework of objectives has been developed based on:

- The current state of the environment in the UU's water supply area (see Section 2.3).
- The key environmental issues identified (see Section 2.3 and summarised in **Table 2.10**).
- The key policy messages and environmental protection objectives identified in the review of policies, and other plans and programmes (see Section 2.2).

It is important that the assessment takes these objectives into account as this will help it to highlight any area where the Drought Plan will help or hinder the achievement of the objectives of other plans.

SEA objectives are set out in **Table 3.1**. As well as the overall SEA objectives, a number of key questions have been developed for each SEA topic which have been used to inform whether the objectives have been met, or not. These key questions have prompted the assessment and ensured it considers all the relevant aspects. A draft list of SEA objectives was developed around these environmental themes and issues, and was included in the Scoping Report. The list and wording of the

objectives was subsequently refined (see **Table 3.1**) following receipt of consultation comments on the Scoping Report.

The following sections describe how SEA objectives have been used in the assessment of the environmental effects of the drought options.

The 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.

Table 3.1: SEA objectives

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
Biodiversity, flora and fauna	Conservation and enhancement of the natural environment and of biodiversity, principally designated sites (international and national) and priority habitats and species, whilst considering climate change and ability to adapt. Encourage a catchment-wide approach to water use to safeguard protection of the natural environment and biodiversity. To attain favourable condition for priority habitats and species. Avoidance of activities likely to cause irreversible damage to natural heritage. Support well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological works, including provision for fish passage and connectivity for migratory/mobile species. Reinforce the connections between people and nature and appreciate the value of biodiversity. Protection and enhancement of natural capital. Ecosystem services from natural capital contributes to	The need to protect, maintain or enhance biodiversity, particularly protected sites designated for nature conservation. The need to avoid activities likely to cause irreversible damage to natural heritage. The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors. The need to control the spread of Invasive Non-Native Species (INNS). The need to recognise the importance of allowing wildlife to adapt to climate change. The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Will it protect and contribute to favourable conservation status of the most important sites for nature conservation (SAC, SPA, Ramsar, SSSI)? Will it protect and enhance aquatic, transitional and terrestrial priority species and habitats? Will it ensure the sustainable management of natural habitats and ecosystems i.e. within their limits and capabilities, taking into account climate change adaptability? Will it affect WFD compliance e.g. good ecological potential/status? Will it ensure maintenance or support provision of fish passage with respect to migratory fish functioning habitat connectivity? Will it protect or enhance natural capital and ecosystem services? Will it provide opportunities for biodiversity net gain, through new habitat creation or restoration and link existing habitats? Will it improve access to nature for people?

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
	the economy and therefore should be protected and, where possible, enhanced. A need to protect the green infrastructure network, including green spaces and other environmental features. 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).		1.2 To avoid introducing or spreading INNS.	Will it limit, reduce or increase the risk of spread of Invasive Non-Native Species (INNS)?
Population and human health	To ensure secure, safe, reliable, dependable, sustainable and affordable supplies of water are provided for all communities and all business sectors. Raise awareness around sustainability, the value of water and using it efficiently. Promotion of healthy communities and protection from risks to health and wellbeing. Protection and improvement of drinking water quality. Water resources play an important health and recreation role. Effective	The need to ensure essential water supplies are safeguarded to all communities to protect public health and wellbeing. Ensuring a balance between different aspects of the built and natural environment that will provide residents and tourists opportunities to access green infrastructure and the natural and historic environment, as well as protecting and enhancing recreational resources.	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Will it help to ensure access to a resilient and secure supply of affordable drinking water? 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?
			2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Will it protect or enhance opportunities for recreation and tourist activities such as public rights of way, including navigation? Will it help to promote healthy communities and protect from risks

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
	water resource management can create opportunities for regeneration, tourism and the wider economy. Access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and wellbeing of communities. To ensure all communities have a clean, safe and attractive environment in which people can take pride, whilst benefiting the economy. Promotion of a sustainable economy supported by universal access to essential utility and infrastructure services. Social and economic consequences of severe droughts.	The need to ensure water quantity and quality is maintained for a range of uses including tourism, recreation, navigation and other use such as agriculture. 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 economy. 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.		to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water /sewerage services)? Does it protect and enhance the green infrastructure network?
			2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Will it assist in ensuring provision of essential infrastructure and services to support health and well-being and a sustainable economy?
Material assets and resource use	Reduce the amount of waste generated through more efficient use of materials, energy and water, thereby promoting sustainable production and consumption. Contribute to a resource efficient, green and competitive low carbon economy. Ensure sustainable use of water resources and maintain a reliable	The need to minimise the consumption of resources including water and energy. The need to continue to reduce leakage from the water supply system and encourage efficient water use to help reduce demand for water. The need to reduce the total amount of waste produced in	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 reduce greenhouse gas emissions through minimising the use of energy and promoting 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)?

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
	public water supply, whilst considering issues of water demand, water supply and water quality in the natural environment. Government expectation for water companies to continue reducing overall demand for water particularly in areas designated as water stressed, or where demand is above the national average. Minimise the production of waste, ensure waste management is in line with the 'waste hierarchy', and eliminate waste sent to landfill. Promote the sustainable management of natural resources.	the assessment area, from all sources. The ned to support development of the circular economy and recognise waste as a potential resource, and reuse where possible. The need to reduce the proportion of waste sent to landfill.		Will it reduce the amount of waste generated and increase the proportion sent to reuse or recycling? Will it encourage reuse of waste materials, including energy recovery?
			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 enable efficient water resource management and ensure maintenance of supply? Will it help to minimise the demand for resources, including water?
Water	Reduce water consumption and promote sustainable water resource management. Ensure appropriate management of abstractions and protect flow and level variability across the full range of regimes from low to high conditions. Maintain and improve water quality (surface waters, groundwater and bathing water). Prevent deterioration of waterbody status and improve the quality of the	The need to further improve the quality of rivers, estuarine and coastal waters taking into account WFD objectives. The need to maintain the quantity and quality of groundwater resources, taking into account WFD objectives. The need to improve the resilience, flexibility and sustainability of water resources in the assessment area, particularly in light of potential climate change	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Will it help to minimise risks associated with unsustainable abstraction of ground and surface waters? Will it abstract from a water resource with resource availability (with reference to CAMS status and WFD considerations)? Will it lead to changes in river flows, wetted width or river level regime? Will it alter the flow or level regime or residence time of surface waters or groundwaters?

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
	water environment and the ecology which it supports, and continue to provide high levels of drinking water quality. Expand the scope of water quality protection measures to all waters, surface waters and groundwater. 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 into account the impacts of climate change. Promote measures to enable and sustain log-term improvement in water efficiency.	impacts on surface water and groundwaters. The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply. The need to ensure that people understand the value of water.		Will it contribute/impact on the ability to meet the river basin management plan objectives? Will it help to mitigate the risks associated with droughts or floods?
			4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Will it present a risk to water quality of surface water, groundwater or estuarine waters? Will it affect WFD compliance e.g. good ecological potential/status, prevent deterioration in WFD status between status classes? Will it affect bathing water compliance? Will it avoid contamination of groundwater?
			4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Will it ensure sustainable abstractions, taking account of water resources availability status? Will it achieve an appropriate balance of supply with other functions and services (including agriculture and navigation)?

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
				Will it help to meet society's needs for a sustainable, resilient water supply?
			4.4 To promote measures to enable and sustain long term improvement in water efficiency.	Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? Will it contribute towards improving the awareness of water sustainability and its true value?
Soil, geology and land use	Protect and enhance the diversity and quality of soils and geology (including geological SSSIs), including geomorphology and geomorphological processes which can be damaged or lost 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.	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).	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Will it avoid damage to and protect geologically important sites (e.g. geological SSSIs) or similar nationally protected sites? Will it avoid damaging the quality of agricultural land? Will it protect and enhance geomorphology and geomorphological processes, including avoiding contribution to coastal erosion? Will it protect and enhance the quality of soils?
			5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Will it ensure efficient use of land (e.g. make use of previously developed land)?

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
	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		5.3 To promote a catchment-wide approach to catchment land management.	Will it contribute towards a catchment based approach to land management?
Air and climate	Reduce the effects of air pollution on ecosystems. Improve overall air quality. 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. Reduce greenhouse gas emissions. Targets include: reduce the UK's greenhouse gas emissions to net zero by 2050. In Wales, at least an 80% reduction in emissions by 2020. Minimise energy consumption, support the use of sustainable /renewable energy and improve resilience to climate change.	The need to reduce air pollutant emissions (industrial processes/transport) and limit air emissions to comply with air quality standards. The need to reduce greenhouse gas emissions (industrial processes and transport). The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term. The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems	6.1 To reduce air pollutant emissions.	Will it reduce or minimise air pollutant emissions? Will it increase emissions to air in areas sensitive to emissions (e.g. in proximity to an AQMA or to sensitive habitat or more deprived area)?
			6.2 To reduce energy consumption and greenhouse gas emissions.	Will it reduce or minimise greenhouse gas emissions? Will it reduce transport or energy requirements?
			6.3 To consider the need for adaptive measures for climate change.	Will it reduce vulnerability or increase resilience to risks associated with climate change effects (e.g. drought)? Will it create opportunities to benefit from potential effects of climate change?

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
	Build in adaption to climate change to future planning and consider the level of urgency of associated risk. Need for adaptive measures to respond to likely climate change impacts on water supply and demand.	(e.g. connectivity) as well as accommodating potential opportunities of climate change.		Will it make use of renewable energy?
Archaeology and cultural heritage	Built development in the vicinity of historic buildings and Scheduled Monuments could have implications for the setting and/or built fabric and cause damage to any archaeological deposits present on the site. Ensure active management of environmental and cultural assets. Ensure effects resulting from changes to water level (surface or sub-surface) on all historical and cultural assets are avoided. Consider effects on important wetland areas with potential for paleoenvironmental deposits. Promote the conservation and enhancement of the historic environment, including the promotion of heritage and landscape as central to the culture of the assessment area and conserve and enhance distinctive characteristics of landscape and settlements.	The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their setting, particularly those which are sensitive to the water environment. The need to have positive strategies for the conservation and enjoyment of the historic environment, particularly for heritage assets that are most at risk of neglect or decay.	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness? Will it maintain and enhance the historic environment, including palaeo- environmental deposits? 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?

SEA Topic	Policies, plans and programmes- key messages	Baseline Key Issues	SEA Objective	Key Questions
	Conserve and enhance the historic environment, heritage assets and their settings.			
Landscape and visual amenity	Protection and enhancement of landscape (including designated landscapes, landscape character, distinctiveness 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. Improve access to valued areas of landscape character in sustainable ways to enhance its enjoyment and value by visitors and stakeholders.	The need to protect and improve the natural beauty of the AONBs, national parks, coastline and other areas of natural beauty in the region, and encourage the growth of woodland and forest in the assessment area. The need to protect and improve the character of landscapes and townscapes in the assessment area.	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Will it result in changes to access to the countryside and open space? Will it avoid adverse effects and enhance designated landscapes, including the protection of outstanding universal value (OUV) features? 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 avoid indirect effects on the landscape resulting from effects of abstraction and low river flows? Will it avoid cumulative effects on landscape features and character from a range of actions and developments?
Inter-relationships		The need to consider the inter-relationships between topics.	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Will there be synergistic effects between topics?

3.3 Primary Assessment

An appraisal framework has been developed and used to assess each of the drought options against the SEA objectives (as set out in **Table 3.1**). The appraisal framework has been applied to test the performance of the drought options against the SEA objectives to see how far they go towards meeting the latter. A draft of the appraisal framework table is given in **Table 3.2** and is structured as follows:

- The first and second columns of **Table 3.2** set out the SEA topics and objectives.
- The scale of the effect, which might relate to either geographical scale or the size of the population affected, will be identified in the third column on a scale of small, medium to large.
- The significance of effect will include consideration of the nature of the impact, certainty, duration, permanence and magnitude (fourth, fifth, sixth and seventh columns of **Table 3.2** in compliance with criteria for determining the likely significance of effects specified in the SEA Regulations Part 2, Regulation 9(2a) and Schedule 1. With respect to duration, short-term impacts will be defined as those that last for up to six months, medium term impacts are those that extend for six months to two years whilst long term impacts are assessed as those that continue for greater than two years.
- The value and sensitivity of the receptor(s) will be identified in the eighth column on a scale of low, medium and high.
- The ninth column has been populated during the assessments with discussion and evaluation of the impact of the drought option on the objectives for each topic, with reference to the key questions set out in **Table 3.2**. The completed appraisal framework tables are presented in full in **Appendix D**.
- The residual adverse and beneficial effects (after application of best practice approaches and any appropriate and explicit mitigation measures) will be identified in the tenth and eleventh columns respectively. These will be identified separately so as to avoid mixing adverse and beneficial effects, in line with SEA best practice.

With regard to effects, or predictions, ODPM Guidelines for SEA (2005) state:

> *5.B.10 Predictions do not have to be expressed in quantitative terms. Hard data may enable Responsible Authorities or expert advisers to make detailed quantitative predictions, and this can be particularly useful where a plan's or programme's effects are uncertain, close to a threshold, or cumulative. However quantification is not always practicable, and qualitative predictions can be equally valid and appropriate. In current practice, these are often expressed in easily understood terms such as 'getting better or worse' or a scale from ++ (very positive) to – – (very negative). It can be useful to link predictions to specific objectives, e.g. 'will the plan or programme promote change in a desired direction?'*

For each SEA objective, a residual effects assessment has been determined against a significance matrix (**Figure 3.1**) which takes account of the value and sensitivity of the receptor (e.g. species, air quality, river water quality, landscape value, heritage feature) and the magnitude of the assessed effect. This significance matrix comprises effects from 'major beneficial' to 'major adverse'. Hatching has been added to the box signifying low magnitude and high receptor value/sensitivity as this could result in a greater than 'moderate' effects being assigned dependent on the sensitivity and value of the receptor.

Figure 3.1: Significance matrix used to assess effects of each drought option on each SEA objective

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

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

The overall findings of the SEA of each topic (e.g. biodiversity, flora and fauna) for each drought option has been expressed by one overarching description of impact significance. This has been colour coded representing a range from major adverse residual impact in red through to major beneficial impacts in dark green (as set out in **Figure 3.2**). In addition, an additional descriptor of "Uncertain" has been satisfactory conclusion regarding the impact. Where an SEA topic is not applicable to a drought option, perceptible change or environmentally acceptable change), this is identified by 'None'.

Figure 3.2: Legend for colour coding of residual impact significance

Legend:

Major Beneficial
Moderate Beneficial
Minor Beneficial
Negligible Beneficial
Negligible Adverse
Minor Adverse
Moderate Adverse
Major Adverse
NOT APPLICABLE
Uncertain - Insufficient data available to undertake assessment

Table 3.2: Example of a SEA Appraisal Framework Table to be Completed for Each Drought Option

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

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

Topic	SEA objective	Scale of effect: (Small/ Medium/ Large)	**Certainty of effect (Low/ Medium/ High)**	Duration (short/ medium /long term)	**Permanence of effect** (permanent/ temporary)	Magnitude of effect (Low/ Medium/ High)	Value/ sensitivity of receptor (Low/ Medium/ High)	Potential residual effect on sensitive receptors	Residual Adverse Effect	Residual Beneficial Effect
Soil, geology and land use	4.4 To promote measures to enable and sustain long term improvement in water efficiency									
	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.									
	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.									
	5.3 To promote a catchment-wide approach to catchment land management.									
Air and Climate	6.1 To reduce air pollutant emissions.									
	6.2 To reduce energy consumption and greenhouse gas emissions.									
	6.3 To consider the need for adaptive measures for climate change.									
Archaeology and cultural	7.1 To conserve and enhance the historic environment, heritage assets and their settings and									

Topic	SEA objective	Scale of effect: (Small/ Medium/ Large)	**Certainty of effect (Low/ Medium/ High)**	Duration (short/ medium /long term)	**Permanence of effect** (permanent/ temporary)	Magnitude of effect (Low/ Medium/ High)	Value/ sensitivity of receptor (Low/ Medium/ High)	Potential residual effect on sensitive receptors	Residual Adverse Effect	Residual Beneficial Effect
	protect archaeologically important sites.									
Landscape and visual amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.									
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.									

The assessment has been undertaken by assessing each of the drought options against the objectives and key questions given in **Table 3.1**. The assessment has been informed by determining how far each drought option goes to meeting the objectives, or how far it results in deviation from the identified objective.

Where suitable mitigation measures are known and identified (e.g. as informed through environmental assessment reports, where available (see **Table 1.5**) or UU's drought management option forms, (see Section 1.4.2) 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[79], the SEA appraisals have been based on residual impacts. The guidance states: "*The assessment should focus on the residual effects along with transparency as to any mitigation measures".*

If, for one topic, a number of different impact significances are concluded, the overarching description of impact significance has been developed taking into account the range of potential impacts.

Table 3.3 sets out an assessment scale that has been used to determine how far each of the drought options goes towards meeting the objective.

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

Table 3.3: Assessment scale used to advise evaluation of each drought option against the objectives

SEA Topic	Objectives	Major Beneficial	Moderate Beneficial	Minor Beneficial	Negligible Adverse / Negligible Beneficial	Minor Adverse	Moderate Adverse	Major Adverse
Biodiversity, flora and fauna	To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Major positive effects on biodiversity, flora and fauna	Moderate positive effects on biodiversity, flora and fauna	Minor positive effects on biodiversity, flora and fauna	No perceptible change or environmentally acceptable change	Minor negative effects on biodiversity, flora and fauna	Moderate negative effects on biodiversity, flora and fauna	Major negative effects on biodiversity, flora and fauna
	To avoid introducing or spreading INNS.	Major positive effects on avoiding the introduction or spreading of INNS	Moderate positive effects on avoiding the introduction or spreading of INNS	Minor positive effects on avoiding the introduction or spreading of INNS	No perceptible change or environmentally acceptable change	Minor negative effects on avoiding the introduction or spreading of INNS	Moderate negative effects on avoiding the introduction or spreading of INNS	Major negative effects on avoiding the introduction or spreading of INNS
Population and human health	To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Degree of positive effects due to the continued supply of drinking water			No perceptible change or environmentally acceptable change	Degree of negative effects due to disruption to the supply of drinking water		
	To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Major positive effects on formal and informal recreation	Moderate positive effects on formal and informal recreation	Minor positive effects on formal and informal recreation	No perceptible change or environmentally acceptable change	Minor negative effects on formal and informal recreation	Moderate negative effects on formal and informal recreation	Major negative effects on formal and informal recreation
	To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Major positive effects on socio-economics	Moderate positive effects on socio-economics	Minor positive effects on socio-economics	No perceptible change or environmentally acceptable change	Minor negative effects on socio-economics	Moderate negative effects on socio-economics	Major negative effects on socio-economics

SEA Topic	Objectives	Major Beneficial	Moderate Beneficial	Minor Beneficial	Negligible Adverse / Negligible Beneficial	Minor Adverse	Moderate Adverse	Major Adverse
Material assets and resource use	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.	Degree of promotion of energy efficiency and energy saving. Degree of minimisation of waste production and/or potential for use of recycled materials during construction phase			No perceptible change or environmentally acceptable change	Degree of increase in waste production		
	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.	Degree of minimisation of consumption of resources. Including the reduction of water use			No perceptible change or environmentally acceptable change	Degree of increase in consumption of resources, including water use		
Water	To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Major positive effects on surface water or groundwater levels and flows	Moderate positive effects on surface water or groundwater levels and flows	Minor positive effects on surface water or groundwater levels and flows	No perceptible change or environmentally acceptable change	Minor negative effects on surface water or groundwater levels and flows	Moderate negative effects on surface water or groundwater levels and flows	Major negative effects on surface water or groundwater levels and flows
	To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Major positive effects on surface water or groundwater quality	Moderate positive effects on surface water or groundwater quality	Minor positive effects on surface water or groundwater quality	No perceptible change or environmentally acceptable change	Minor negative effects on surface water or groundwater quality	Moderate negative effects on surface water or groundwater quality	Major negative effects on surface water or groundwater quality
	To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Major positive effects on the sustainable management of abstractions and balance of supply with other functions and services	Moderate positive effects on the sustainable management of abstractions and balance of supply with other functions and services	Minor positive effects on the sustainable management of abstractions and balance of supply with other functions and services	No perceptible change or environmentally acceptable change	Minor negative effects on the sustainable management of abstractions and balance of supply with other functions and services	Moderate negative effects on the sustainable management of abstractions and balance of supply with other functions and services	Major negative effects on the sustainable management of abstractions and balance of supply with other functions and services

SEA Topic	Objectives	Major Beneficial	Moderate Beneficial	Minor Beneficial	Negligible Adverse Negligible Beneficial	Minor Adverse	Moderate Adverse	Major Adverse
	To promote measures to enable and sustain long term improvement in water efficiency.	Major positive effects on improvements in water efficiency and the awareness of water sustainability	Moderate positive effects on improvements in water efficiency and the awareness of water sustainability	Minor positive effects on improvements in water efficiency and the awareness of water sustainability	No perceptible change or environmentally acceptable change	Minor negative effects on improvements in water efficiency and the awareness of water sustainability	Moderate negative effects on improvements in water efficiency and the awareness of water sustainability	Major negative effects on improvements in water efficiency and the awareness of water sustainability
Soil, geology and land use	To protect and enhance geology, geomorphology and the quality and quantity of soils.	Major positive effects on the enhancement of geology, geomorphology and the quality and quantity of soils Degree of conservation or promotion of conservation of geologically important sites	Moderate positive effects on the enhancement of geology, geomorphology and the quality and quantity of soils Degree of conservation or promotion of conservation of geologically important sites	Minor positive effects on the enhancement of geology, geomorphology and the quality and quantity of soils Degree of conservation or promotion of conservation of geologically important sites	No perceptible change or environmentally acceptable change	Minor negative effects on geologically important sites through loss of land and reduction in soil quality	Moderate negative effects on geologically important sites through loss of land and reduction in soil quality	Major negative effects on geologically important sites through loss of land and reduction in soil quality
	To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Degree of promotion of the use of previously developed land.			No perceptible change or environmentally acceptable change	Degree of use of previously developed land		
	To promote a catchment-wide approach to catchment land management	Degree of promotion of a catchment-wide approach to catchment land management			No perceptible change or environmentally acceptable change	Degree of promotion of a catchment-wide approach to catchment land management		
Air and climate	To reduce air pollutant emissions.	Degree of improvements to air quality e.g. through replacement of equipment with more energy efficient models			No perceptible change or environmentally acceptable change	Degree of air quality impacts during construction (e.g. dust, CO_2) and proximity to AQMAs		

SEA Topic	Objectives	Major Beneficial	Moderate Beneficial	Minor Beneficial	Negligible Adverse / Negligible Beneficial	Minor Adverse	Moderate Adverse	Major Adverse
	To reduce energy consumption and greenhouse gas emissions.	Degree of minimisation of greenhouse gas emissions, for example through sourcing energy from renewable sources			No perceptible change or environmentally acceptable change	Degree of increase in greenhouse gas emissions		
	To consider the need for adaptive measures for climate change.	Degree of reduced vulnerability or increase resilience to risks associated with climate change			No perceptible change or environmentally acceptable change	Degree of increased vulnerability or reduced resilience to risks associated with climate change		
Archaeology and cultural heritage	To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites	Degree of conservation or promotion of conservation of archeologically important sites			No perceptible change or environmentally acceptable change	Minor negative effects on archeologically important sites	Moderate negative effects on archeologically important sites	Major negative effects on archeologically important sites
Landscape and visual amenity	To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Major positive effects on designated and undesignated landscapes, and/or landscape character, including the protection of outstanding universal value (OUV) features	Moderate positive effects on designated and undesignated landscapes, and/or landscape character, including the protection of outstanding universal value (OUV) features	Minor positive effects on designated and undesignated landscapes, and/or landscape character, including the protection of outstanding universal value (OUV) features	No perceptible change or environmentally acceptable change	Minor negative effects on designated and undesignated landscapes, and/or landscape character, including the protection of outstanding universal value (OUV) features	Moderate negative effects on designated and undesignated landscapes, and/or landscape character, including the protection of outstanding universal value (OUV) features	Major negative effects on designated and undesignated landscapes, and/or landscape character, including the protection of outstanding universal value (OUV) features
Inter-relationships	To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Degree of potential for beneficial impacts between topics			No perceptible change or environmentally acceptable change	Degree of potential for negative impacts between topics		

As referred to above, information provided by drought management option forms (included by UU in its Revised Draft Drought Plan 2022) has been used to complete the assessments. Where qualitative and/or quantitative information was available for an option (e.g. as identified by an Environmental Report, Review of Consents etc.), this has been used to inform the assessment, as explained below.

As described in Section 1.5, environmental assessment reports have been prepared by UU for all drought permit sites (see **Table 1.5**). These reports have been reviewed and the residual impacts to receptors (i.e. including those mitigation measures incorporated for avoidance, cancellation and reduction of impacts) have been used to inform the SEA. It is noted that the Environmental Reports were prepared with information and data available at the time of writing, and are to be reviewed and updated periodically to incorporate any changes to the baseline and any resulting implications for the impact assessment.

Consideration was also given to the relative locations of drought option sites and internationally and nationally designated sites. Where an Environmental Report has not been prepared for the drought option (e.g. supply side options), screening for effects has been determined on a proximity basis. Designated site(s) that are within 10km of the drought option location were identified and reviewed. Consideration was also given to sites within the same surface and groundwater catchments (where this information was available) to ensure that any connectivity over a longer distance that might affect water-dependent sites was taken into account. The Environment Agency had previously provided GIS mapping of groundwater Source Protection Zones (SPZs). The available information on the hydrological influence of each option has been summarised in the assessment tables (**Appendix D**).

Information and assessments from the Environment Agency's Review of Consents has also been used to inform the assessment. This is particularly applicable to supply side drought options (which are all operations within existing licensed conditions). The Review of Consents has also informed the assessment for drought permit options. It is noted, however, that the Review of Consents was carried out on normal licensed operating conditions and did not consider drought permit actions.

Where detailed environmental information was not available, professional judgement has been used to carry out the assessment, and it is noted that in some cases, there was not sufficient information to undertake the assessment. The assessment was aided by a prompt list of key questions to be considered in relation to each objective. Spatial analysis of each option in relation to environmental baseline features was also used. This used maps showing baseline features that could be affected by the option, to help the assessor determine the likelihood of effects occurring. Assessment of significance is based on the available information, using professional judgement and guidelines where appropriate (including CIEEM[80] and IEMA[81] Guidelines for EIA; noting, however, that these guidelines are focussed towards more detailed EIA assessment).

The impact evaluation includes consideration of the nature of the impact, complexity, duration, frequency, reversibility and probability of impact, in compliance with criteria for determining the likely significance of effects specified in the SEA Regulations Part 2, Regulation 9(2a) and Schedule 1. Temporary impacts could equate to periods of up to 6 months for the drought option (i.e. 6 months is the duration of a single drought permit should one be granted) plus any recovery time thereafter. Where known, any secondary effects of each option have been considered.

The appraisal table completed for each drought option (as documented in Section 1.4.2) includes a discussion of the justification for the impact ascribed, and a summary of the information (quantitative,

[80] Chartered Institute of Ecology and Environmental Management (2019)*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial. Freshwater and Coastal*. Version 1.1, September 2019.
[81] *Guidelines for Environmental Impact Assessment*, Institute of Environmental Management and Assessment, 2004

qualitative, professional judgement, etc.) that it is based on, and any difficulties such as uncertainties or limitations in the information, in line with ODPM recommendations.

The completed appraisal tables for each drought option are presented in full in **Appendix D**. A summary of the assessment is presented as a colour-coded visual evaluation (VE) matrix in Section 4. An example of a VE matrix is given in **Table 3.4**. For each drought option and each SEA topic listed in the left hand column of **Table 3.4**, the VE matrix summarises the likely significance of impacts (which is discussed in full in the completed appraisal tables presented in **Appendix D**).

Table 3.4: Example of a visual evaluation matrix

Drought option	Summary of potential impacts	SEA Topic									Comments
		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 and visual amenity	Inter-relationships	
Drought Option 1	*Summary of key impacts of implementing the drought option*										[summary]
Drought Option 2	*Summary of key impacts of implementing the drought option*										[summary]

Legend:

Major Beneficial	
Moderate Beneficial	
Minor Beneficial	
Negligible	
Minor Adverse	
Moderate Adverse	
Major Adverse	
NOT APPLICABLE	None
Uncertain - Insufficient data available to undertake assessment	

3.4 Secondary, Cumulative and Synergistic Environmental Effects Assessment

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.…*". This involves examining the likely significant effects of each of the drought options individually, in combination with each other (both inter- and intra- water resource zone), and in combination with the implementation of other plans and programmes. In assessing these effects, consideration has been given to factors which may affect the receiving environment in the short, medium and long term. Cumulative effects can include secondary effects and synergistic effects (those which interact to produce an impact greater than the sum of the individual parts)[82].

Supply side, demand side and drought permit drought options which have been assessed are listed in **Table 1.1** to **Table 1.3**. The locations of supply side and drought permit options are provided in **Appendix E**. The following cumulative, or in-combination, assessments have been undertaken:

1. For each supply side and drought permit option, assessment of the cumulative impacts of the option with UU's existing abstraction licences that operate within the zone of influence of the drought option. The results of these assessments have been summarised in **Table 5.1**(see Section 5.2).
2. Within each of UU's water resource zones, assessment of cumulative impacts of each of UU's supply side and each drought permit option, with each of UU's supply side and each drought permit option (intra-zone). Incompatible options have also been identified. These assessments are summarised as a matrix for each water resource zone (see Section 5.3).
3. Assessment of cumulative impacts of UU's supply side and drought permit options between each of UU's water resource zones (inter-zone) (see Section 5.4).
4. Within UU's entire water supply area, assessment of cumulative impacts of each demand management option with each demand management option. Note that demand management options are consistent across the whole of UU's region, and therefore the assessment takes into account the implementation of each option across the whole of UU's supply region. Demand management measures serve to reduce pressure on water resources and will have a positive influence on both supply side and drought permit options within each water resource zone (by reducing the demand for water and reducing abstraction at source). Therefore, demand management measures have not been assessed in detail against each supply side and drought permit option, other than to acknowledge that they will have a net positive effect by reducing pressure on water resources (see Section 5.5).
5. The following combination of drought options which have the potential to impact on the River Eden SAC will be assessed cumulatively[83] (see Section 5.6):

- North Eden boreholes drought permit options (Bowscar, Gamblesby, Tarn Wood)
- Ullswater drought permit option
- Castle Carrock dead storage supply side option[84].

6. Assessment of cumulative impacts with UU's WRMP schemes which are scheduled to be implemented and become operational within the time period of the Drought Plan (see Section 5.7).
7. Assessment of cumulative impacts of UU's Revised Draft Drought Plan 2022 with drought options included in Environment Agency Drought Plans (see Section 5.8)
8. Assessment of cumulative impacts of UU's Revised Draft Drought Plan 2022 with drought options included in neighbouring water company Drought Plans (see Section 5.9).

[82] Office of the Deputy Prime Minister (2005). *A Practical Guide to the Strategic Environmental Assessment Directive*.
[83] *This assessment has been included in response to comments from the Environment Agency on the SEA of the Drought Plan 2014*
[84] Note the Environment Agency also requested consideration of any scheme with an impact on the River Gelt within this cumulative assessment, but no such scheme has been included as a drought option in UU's Revised Draft Drought Plan 2022.

9. Assessment of cumulative impacts of UU's Revised Draft Drought Plan 2022 with National Policy Statements (see Section 5.10).

As described in Section 1.2.3, Drought Plans comprise a basket of measures, the implementation of which are dependent on the particular drought conditions experienced and are subject to temporal, spatial and other factors. The 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 UU's Drought Plan 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 is difficult 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 construction phases and then the operational phases of 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). In practice, the drought options are generally spatially distant and/or will be implemented at slightly different times (temporally distant).

Due to the uncertainty of timing of implementation of drought options, assessments of each drought option with each other drought option have been undertaken with the intention that in the event of a drought, the findings of the SEA 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 (inter- and intra- zone) presented in Sections 5.3 and 5.4.

The assessment of cumulative, or in-combination, effects have been informed by drought option forms prepared by UU and presented in Appendix D of the Revised Draft Drought Plan 2022). Mapping of the locations of the drought options, surface water catchments and groundwater catchments has been used to inform these assessments. Where information from the Environment Agency's Review of Consents is available for an abstraction licence, this has also been used to inform the in-combination assessment. It is noted, however, that the Review of Consents was carried out on normal licensed operating conditions and did not consider drought permit options. As such, information from the Review of Consents has been reviewed for context only. Where detailed information on the potential for cumulative effects is not available, cumulative effects have been considered using professional judgment.

3.5 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 options already undertaken by UU. No primary research or survey work has been carried 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 UU's Drought Plan should also be noted as discussed in Section 3.4, as implementation of drought options are dependent on the particular drought conditions experienced meaning that it may be difficult to provide an accurate cumulative assessment of the impacts of the plan for a possible future drought event.

Where site specific limitations or outstanding issues are known, these are briefly described in the SEA appraisal tables for the relevant drought option concerned.

4 Assessment of Drought Options

4.1 Drought Options Assessed

Supply side and drought permit drought options which have been assessed for each of the four water resource zones are listed in **Table 1.1** and **Table 1.3**, respectively. The locations of these are provided in **Appendix E**. Demand management schemes which have been assessed are common to all zones and are listed in **Table 1.2**.

4.2 Assessment of Schemes Against SEA Objectives

Assessment of drought options has been carried out in accordance with the methodology described in Section 3. Appraisal framework assessment tables have been completed for each drought option, and are presented in full in **Appendix D**. A summary of the assessments are presented in Sections 4.3, 4.4 and 4.5 as colour-coded visual evaluation (VE) matrices. For each drought option and each SEA topic listed in the left hand column of **Table 3.1**, 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. The definitions of these significance levels are set out in Section 3.3.

4.3 Supply Side Options

4.3.1 Strategic Resource Zone

No supply side options have been identified in the Strategic Resource Zone.

4.3.2 Carlisle Resource Zone

Castle Carrock Reservoir dead storage is the only supply side drought option in the Carlisle Resource Zone. A visual summary of SEA conclusions for this option is provided in **Table 4.1**. The completed appraisal table for the drought option is provided in **Appendix D**. The option involves abstraction of dead water from Castle Carrock Reservoir (which is not part of any area designated for nature conservation), and is not dependent on abstraction from the River Gelt i.e. the reservoir can be drawn down even if there is no abstraction from the river. Adverse environmental impacts are associated with drawdown of the reservoir on fish populations within the reservoir itself and landscape and visual amenity, as the site is within North Pennines AONB. There are, however, beneficial impacts on population and human health due to increased security of public water supply.

4.3.3 North Eden Resource Zone

No supply side options have been identified in the North Eden Resource Zone.

Table 4.1: Visual evaluation matrix summary for supply side options

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 and Visual Amenity	Inter-relationships	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	9.1	
Strategic Resource Zone																						
None																						
Carlisle Resource Zone																						
Castle Carrock Reservoir, dead water storage	Adverse											None			None			None				The implementation of this drought option would result in a minor adverse impacts on biodiversity and population and human health, due to potential impacts on fish populations and resulting impacts on angling. There are also anticipated to be temporary minor adverse impacts on river flows and water quality. Reservoir drawdown and exposure of shoreline margins may result in minor adverse impacts to soil, geology and land use. The impact of the drought option on landscape and visual amenity is considered to be moderate adverse but temporary. Impacts to inter-relationships between topics have been summarised as moderate adverse.
	Beneficial	None	None		None		None	None	None	None		None			None	None	None		None	None		Overall three minor beneficial effects were identified. These were in relation to population and human health based on continued supply of drinking water and a beneficial impact on adaptation to climate change. The remaining impacts on water, soil and geology, and inter-relationships would be negligible.
North Eden Resource Zone																						
None																						

Legend:

Major Beneficial	
Moderate Beneficial	
Minor Beneficial	
Negligible	
Minor Adverse	
Moderate Adverse	
Major Adverse	
NOT APPLICABLE	None
Uncertain - Insufficient data available to undertake	

4.4 Demand Side Options

A visual summary of SEA conclusions for each of the demand side options in UU's Revised Draft Drought Plan 2022 is provided in **Table 4.2**. 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 within each water resource zone by reducing customer demand for water, and therefore reducing the abstraction at source. This will in turn contribute to reducing the amount of energy needed for water abstraction, treatment and distribution. Impacts on the SEA topics material assets and resource use and water are minor to moderate beneficial for these drought options, due to decreased demand, and correspondingly reduced abstraction at source. Water savings will contribute to increased security of public water supply, resulting in minor to moderate beneficial impacts on population and human health.

Impacts on population and human health are minor to moderate adverse for water restrictions with impacts on recreation and businesses which are dependent on water use and/or pressure.

It is noted that small scale construction activities are associated with leakage detection and repair activities, which will result in increased energy and material usage, but overall, taking into account reductions in water lost, the impact of this option on material assets and resource use has been summarised as minor beneficial.

Table 4.2: Visual evaluation matrix summary for demand side options

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	Landscape and Visual Amenity	Inter-relationships	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	9.1	
Drought Publicity	Adverse	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	Overall negligible adverse effects have been identified relating to topics including Biodiversity, Flora and Fauna, Population and Human Health, Material Assets and Resource Use, Water, and Landscape and Visual Amenity, and Inter-relationships.
	Beneficial		None		None					None			None	None	None	None	None		None			Minor beneficial effects have been identified relating to Population and Human Health, Material Assets and Resource Use, Water and Air and Climate. The effect on inter-relationships was also assessed to be minor beneficial.
Enhanced leakage detection and repair	Adverse		None		None	None		None	None	None	None	None			None			None				Negligible adverse effects have been identified for the topics of Biodiversity, Population and Human Health, Material Assets and Resources, Soil, Geology and Land Use, Air and Climate, Landscape and Visual Amenity and Inter-relationships. These impacts are largely anticipated to be temporary and in relation to construction.
	Beneficial		None		None		None			None			None	None	None				None			Minor beneficial effects have been identified for the topics of Population and Human Health, Material Assets and Resource Use Water, and Air and Climate. The effects upon inter-relationships are assessed to be minor beneficial.
Campaign for voluntary water use restraint	Adverse	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	Overall negligible adverse effects have been identified relating to topics including Biodiversity, Flora and Fauna, Population and Human Health, Material Assets and Resource Use, Water, and Landscape and Visual Amenity, and Inter-relationships.
	Beneficial		None		None					None			None	None	None	None	None		None			Minor beneficial effects have been identified for the topics of Population and Human Health, Material Assets and Resource Use Water, and Air and Climate. The effects upon inter-relationships are assessed to be minor beneficial.
Temporary Use Ban (TUB)	Adverse	None	None				None		None	None	None	None	None	None	None	None	None	None	None	None	None	Minor adverse effects are anticipated on Population and Human Health as a result of impacts to informal recreation, domestic customers and certain business sectors.
	Beneficial		None		None	None				None			None	None	None	None	None		None			Minor beneficial effects have been identified for the topics of Population and Human Health, Material Assets and Resource Use Water, and Air and Climate. The effects upon inter-relationships are assessed to be minor beneficial.
Ordinary Drought Order (Non-Essential Use Ban)	Adverse	None	None				None	None	None	None		None	None	None	None	None	None	None	None			Minor to moderate adverse effects are anticipated on Population and Human Health as a result of impacts to informal recreation, domestic customers and certain business sectors.
	Beneficial		None		None	None				None			None	None	None	None	None		None			Minor to moderate beneficial effects have been identified for the topics of Population and Human Health, Material Assets and Resource Use Water, and Air and Climate. The effects upon inter-relationships are assessed to be minor beneficial.
Pressure management	Adverse	None	None		None		None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	Minor adverse impacts are anticipated to Population and Human Health as a result of the impact pressure management would have upon water-dependent businesses.
	Beneficial		None		None					None		None	None	None	None	None			None			Overall moderate beneficial effects are anticipated to Population and Human Health, Material Assets and Resource Use, Water and Air and Climate. The effects upon Inter-relationships are assessed to be minor beneficial.

Legend:

Major Beneficial	
Moderate Beneficial	
Minor Beneficial	
Negligible	
Minor Adverse	
Moderate Adverse	
Major Adverse	
NOT APPLICABLE	
Uncertain - Insufficient data available to undertake assessment	

4.5 Drought Permit Options

4.5.1 Strategic Resource Zone

A visual summary of SEA conclusions for each of the drought permit options in the Strategic Resource Zone is provided in **Table 4.3**. The completed appraisal tables for each of the drought options are provided in **Appendix D**.

Beneficial impacts on population and human health range from minor to major beneficial, based on improved security of public water supply. Minor adverse impacts are also anticipated on population and human health in relation to recreation (including angling) and local socio-economics.

Impacts on air and climate include minor to moderate beneficial impacts on climate change adaptation for all drought permit options, related to the effects on resilience of water supplies to drought.

Many of the drought permit options have a negative effect on the objectives for biodiversity, flora and fauna, water and landscape and visual amenity. This reflects the impacts of reduced surface water flows and levels on the environment within the zone of influence of the schemes and associated impacts on water quality. These impacts on biodiversity, flora and fauna are assessed as minor adverse for all drought permit options.

The assessment of the impacts of drought permit options has been informed by the Environmental Assessments which have been undertaken by UU for each of these options (see Section 1.5).

4.5.2 Carlisle Resource Zone

No drought permit/order options have been identified in the Carlisle Resource Zone.

4.5.3 North Eden Resource Zone

A visual summary of SEA conclusions for the drought permits in the North Eden Resource Zone is provided in **Table 4.3**. The completed appraisal table for the drought options is provided in **Appendix D**. The drought permit options n the North Eden Resource Zone are all groundwater sources.

Impacts on population and human health are minor to moderate beneficial, based on improved security of public water supply. Impacts on air and climate include minor to moderate beneficial impacts on climate change adaptation for all drought permit options, related to the effects on resilience of water supplies to drought.

Minor adverse impacts on water are anticipated in relation to potential impacts on third party abstractions. No adverse impacts on biodiversity, flora and fauna, water and landscape and visual amenity are predicted.

The assessment of the impacts of the drought permit options has been informed by the Environmental Assessments which have been undertaken by UU for this option (see Section 1.5).

Table 4.3: Visual evaluation matrix summary for drought permit options

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 and Visual Amenity	Inter-relationships	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	9.1	
Strategic Resource Zone																						
Delph Reservoir	Adverse					None	None	None				None		None	None	None	None	None				Overall, minor adverse effects were identified relating to the impact of riverine flow reduction on biodiversity, water quality, fluvial geomorphology and landscape and visual amenity. The impact of inter-relationships has been assessed as minor.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None		None	Minor beneficial effects were identified relating to population and human health based on continued supply of drinking water and benefits associated with the landscape amenity of the reservoir. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Dovestone Reservoir 10 Ml/d	Adverse					None	None	None				None		None	None	None	None	None				Minor adverse effects were identified relating to the impact of river flow reduction on biodiversity, water quality, fluvial geomorphology and landscape and visual amenity. The effect on Inter-relationships has been assessed as minor.
	Beneficial	None	None		None					None	None	None	None	None	None	None	None		None	None		Overall minor beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Dovestone Reservoir 5 Ml/d	Adverse					None	None	None				None		None	None	None	None	None				Minor adverse effects were identified relating to the impact of river flow reduction on biodiversity, water quality, fluvial geomorphology and landscape and visual amenity. The effect on Inter-relationships has been assessed as minor.
	Beneficial	None	None		None					None	None	None	None	None	None	None	None		None	None		Overall moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. As the drought permit will slow the rate of drawdown, it is also predicted to have a small positive effect on reservoir water level and exposure. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Fernilee Reservoir	Adverse			None		None	None					None		None	None	None	None	None				Minor adverse effects are anticipated to biodiversity, water flow and levels and fluvial geomorphology. The effect on Inter-relationships has also been assessed as minor.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Overall, minor beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Jumbles Reservoir 12 Ml/d	Adverse			None			None	None				None		None	None	None	None	None				The implementation of this drought option would result in minor adverse effects on the spread of INNS, water levels and flows, water quality, fluvial geomorphology and visual amenity. Subsequently, the impacts on inter-relationships have been assessed as minor.
	Beneficial	None	None						None	None	None	None	None	None	None	None	None		None			Minor beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change. Minor beneficial impacts were assessed due to the drought option resulting in more water being retained in Jumbles Reservoir, which would be expected to have a positive impact on aesthetics.

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 and Visual Amenity	Inter-relationships	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	9.1	
Jumbles Reservoir 6 Ml/d	Adverse			None			None	None				None		None	None	None	None	None				The implementation of this drought option would result in moderate adverse impacts to water levels and flows, and water quality. Minor adverse impacts are anticipated to biodiversity. A reduction in water levels would also result in minor adverse impacts upon WFD status, fluvial geomorphology, and landscape and visual amenity. Therefore the impact upon inter-relationships has been assessed as minor adverse.
	Beneficial	None	None						None	None	None	None		None	None	None	None		None			Improved resilience of water supplies to drought is assessed to have a moderate beneficial impact on adaptation to climate change. Moderate beneficial effects were also identified in relation to population and human health based on continued supply of drinking water. More water retained in the reservoir is anticipated to have a minor beneficial impact on recreation and landscape and visual amenity.
Longden-dale Reservoirs 25 Ml/d	Adverse			None		None	None	None				None		None	None	None	None	None				Moderate adverse impacts are anticipated on water levels and flow. The implementation of this drought option would result in minor adverse impact on biodiversity, water quality and on water dependent ecosystems in the affected reach. There would also be minor adverse impacts on the aesthetics and landscape of the study area
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Overall two major beneficial effects were identified relating to population and human health based on continued supply of drinking water. There would also be a minor beneficial impact from the drought option for adaptation to climate change. The remaining beneficial impacts on material assets and resources would be negligible.
Longden-dale Reservoirs 15 Ml/d	Adverse			None		None	None	None				None		None	None	None	None	None				Moderate adverse impacts are anticipated on water levels and flow. The implementation of this drought option would result in minor adverse impact on biodiversity, water quality and on water dependent ecosystems in the affected reach. There would also be minor adverse impacts on the aesthetics and landscape of the study area
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Overall two major beneficial effects were identified relating to population and human health based on continued supply of drinking water. There would also be a minor beneficial impact from the drought option for adaptation to climate change. The remaining beneficial impacts on material assets and resources would be negligible.
River Lune LCUS abstraction	Adverse						None	None				None		None	None	None	None	None				Minor adverse effects were identified relating to population and human health due to the impact upon recreation including angling and navigation. The effect on Inter-relationships has also been assessed as minor.
	Beneficial	None	None						None	None	None	None	None	None	None	None	None		None	None		Minor to moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Rivington Reservoirs – Brinscall Brook	Adverse			None		None	None	None				None		None	None	None	None	None				Overall minor adverse effects were identified relating to the impact of riverine flow reduction on biodiversity, flora and fauna, water quality, fish populations, ecosystem functions and services and landscape and visual amenity. Negligible adverse impacts are anticipated to the spread of INNS, angling, fluvial geomorphology, archaeology and visual amenity. The impact upon inter-relationships has been assessed as moderate.

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 and Visual Amenity	Inter-relationships	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	9.1	
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Two moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Rivington Reservoirs – White Coppice	Adverse			None		None	None	None				None		None	None	None	None	None				Overall minor adverse effects were identified relating to the impact of riverine flow reduction on biodiversity, flora and fauna, water quality, fish populations, ecosystem functions and services and landscape and visual amenity. Negligible adverse impacts are anticipated to the spread of INNS, angling, fluvial geomorphology, archaeology and visual amenity. The impact upon inter-relationships has been assessed as moderate.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Two moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change
Ullswater	Adverse			None		None						None		None	None			None				Minor adverse effects were identified relating to Material Assets and Resource due to increased energy requirements.
	Beneficial	None	None		None			None	None	None	None	None	None	None	None	None	None		None	None		Overall, minor beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Lake Vyrnwy	Adverse			None			None	None				None		None	None	None	None	None				Overall minor adverse effects were identified relating to the impact on Biodiversity, Population and Human Health, and Water. The effect on Inter-relationships has also been assessed as minor.
	Beneficial	None	None		None				None	None	None	None	None	None	None	None	None		None	None		Moderate beneficial effects were identified relating to population and human health based on continued supply of drinking water. Improved resilience of water supplies to drought is assessed to have a moderate beneficial impact on adaptation to climate change.
Lake Windermere	Adverse			None		None		None				None		None	None			None				Minor adverse impacts were identified relating to Biodiversity and Material Assets and Resource Use. The abstraction of water from Windermere will increase energy consumption and, therefore, greenhouse gas emissions, having a minor adverse impact upon Air and Climate. The effect on Inter-relationships has also been assessed as minor.
	Beneficial	None	None		None			None	None	None	None	None	None	None	None	None	None		None	None		The impact of the drought option on population and human health has been assessed as major beneficial based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a moderate beneficial impact on adaptation to climate change.
Carlisle Resource Zone																						
None																						
North Eden Resource Zone																						
Eden Valley	Adverse		None	None		None						None		None	None			None				Overall one minor adverse effect was identified relating to the impact of riverine flow reduction on third party abstractors.

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 and Visual Amenity	Inter-relationships	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	9.1	
boreholes - Bowscar boreholes																						
	Beneficial	None	None		None		None	None	None	None	None	None	None	None	None	None	None		None	None		Overall, moderate beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a moderate beneficial impact on adaptation to climate change.
Eden Valley boreholes - Gamblesby boreholes	Adverse		None	None		None						None		None	None			None				Overall one minor adverse effect was identified relating to the impact of riverine flow reduction on third party abstractors.
	Beneficial	None	None		None		None	None	None	None	None	None	None	None	None	None	None		None	None		Overall, minor beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.
Eden Valley boreholes - Tarn Wood boreholes	Adverse		None	None		None						None		None	None			None				Overall one minor adverse effect was identified relating to the impact of riverine flow reduction on third party abstractors.
	Beneficial	None	None		None		None	None	None	None	None	None	None	None	None	None	None		None	None		Overall, moderate beneficial effects are anticipated to population and human health based on continued provision of public water supplies. Improved resilience of water supplies to drought is assessed to have a minor beneficial impact on adaptation to climate change.

Legend:

Major Beneficial	
Moderate Beneficial	
Minor Beneficial	
Negligible	
Minor Adverse	
Moderate Adverse	
Major Adverse	
NOT APPLICABLE	None
Uncertain - Insufficient data available to undertake assessment	

4.6 Summary

Demand side options were found in general to have positive impacts on SEA objectives for population and human health and material assets and resource use. Adverse impacts on population and human health were associated with options involving water restrictions.

The magnitude of impact on SEA objectives for supply side and drought permit options varied between the options. Adverse impacts were mainly associated with adverse changes to surface water levels and flows and associated impacts on biodiversity, flora and fauna. Beneficial impacts on population and human health and on air and climate are associated with increased security of public water supply in drought conditions.

5 Cumulative Effects Assessment

5.1 Introduction

The cumulative, or in-combination, assessment findings presented in this section have been carried out in line with the methodology described in Section 3.4. Supply side and drought permit drought options which have been assessed are listed in **Table 1.1** and **Table 1.3**, respectively. The locations of these are provided in **Appendix E**.

5.2 Cumulative Effects With UU's Existing Abstraction Licences

Each supply side and drought permit option was reviewed to determine if any of UU's existing operational abstraction licences may have the potential to act cumulatively with the drought option, as described in Section 3.4. Mapping of location of drought options, surface water catchments and groundwater catchments has been used to inform these assessments. Where a licence has been subject to the Environment Agency Review of Consents, the information provided has been used to inform this assessment (noting that the Review of Consents was carried out on existing abstraction licence conditions and not drought permit conditions).

For drought permit options which constitute a modification to an existing abstraction licence, the cumulative impacts of the drought option with the existing licence are intrinsic in the primary assessment of the drought permit options (as presented in Section 4.5), and are not considered further here.

Figure 5.1 sets out the legend against which the findings of the cumulative assessments of UU's drought options with UU's existing licences are based, as set out in **Table 5.1**.

Figure 5.1: Legend for colour coding the cumulative assessments of UU's drought options with UU's existing abstraction licences

Legend

	No cumulative effects identified
	Groundwater schemes: Both options abstract from the same groundwater catchment, but with no adverse impacts anticipated
	Groundwater schemes: Both options abstract from the same groundwater catchment, with adverse impacts anticipated
	Options with potential for groundwater-surface water interactions
	Surface water schemes: Both options affect the same surface water resource but with no adverse impact anticipated
	Surface water schemes: Both options affect the same surface water resource with adverse impact anticipated
	Surface water schemes: Both options affect the same surface water resource and are sequential
	Uncertain – insufficient information available to undertake assessment

Table 5.1: Summary of potential cumulative effects of supply side and drought permit options and existing UU abstraction licences (options marked with # are also drought permit options).

Drought option	Existing licences within zone of influence	Potential for cumulative effects	Assessment summary
Supply Side options			
Strategic Resource Zone			
None			
Carlisle Resource Zone			
Castle Carrock Reservoir, dead water storage	None identified	-	-
North Eden Resource Zone			
None	-	-	-
Drought Permit Options			
Strategic Resource Zone			
Delph Reservoir	Dingle Reservoir	No cumulative impacts identified	
	Jumbles Reservoir#	Delph Reservoir compensation flow enters Delph Brook and then Eagley Brook. Jumbles reservoir compensation flow enters Bradshaw Brook. Bradshaw Brook and Eagley Brook join to form the River Croal. Adverse impacts are anticipated	
	Longworth Clough, Turton	No cumulative impacts identified	
	Springs Reservoir	No cumulative impacts identified	
Dovestone Reservoir	Longdendale Reservoir#	The compensation flows from both reservoirs eventually enter the River Mersey, with adverse impact anticipated	
	Yeoman Hey Reservoir	No cumulative impacts identified	
Fernilee Reservoir	None identified	-	-
Jumbles Reservoir	Delph Reservoir#	Delph Reservoir compensation flow enters Delph Brook and then Eagley Brook. Jumbles reservoir compensation flow enters Bradshaw Brook. Bradshaw Brook and Eagley Brook join to form the River Croal. Adverse impacts are	

Drought option	Existing licences within zone of influence	Potential for cumulative effects	Assessment summary
		anticipated	
Longdendale Reservoirs	Arnfield Reservoir	No cumulative impacts identified	
	Dovestone Reservoir#	The compensation flows from both reservoirs eventually enter the River Mersey with adverse impact anticipated	
	Hollingworth Reservoir	No cumulative impacts identified	
	Rhodeswood Reservoir	Rhodeswood Reservoir is part of the Longdendale chain of reservoirs. The drought permit at Longdendale Reservoir will result in more water in the system, and therefore no adverse cumulative impacts are identified.	
	Torside Reservoir	Torside Reservoir is part of the Longdendale chain of reservoirs. The drought permit at Longdendale Reservoir will result in more water in the system, and therefore no adverse cumulative impacts are identified.	
	Swineshaw Reservoir	No cumulative impacts identified	
	Torside Goyt	No cumulative impacts identified	
	Woodhead Reservoir	No cumulative impacts identified	
River Lune LCUS abstraction	River Lune at Caton	UU's Caton abstraction is upstream of the LCUS abstraction. The River Lune LCUS drought option relates to reducing the hands-off flow at Skerton Weir, which is downstream of both abstractions. Therefore, although both schemes abstract from the same resource, no adverse cumulative effects have been identified	
	River Lune at Lower Halton Weir	This source is downstream of the LCUS abstraction however this abstraction has never been utilised by UU and is unlikely to be in the future. Therefore, no cumulative effects have been identified	
Rivington Reservoirs – Brinscall Brook	Rivington Reservoirs – White Coppice#	Both White Coppice and Brinscall Brook flow in to the River Yarrow with adverse impact anticipated	
Rivington Reservoirs – White Coppice	Rivington Reservoirs – Brinscall Brook#	Both White Coppice and Brinscall Brook flow in to the River Yarrow with adverse impact anticipated	
Ullswater	None identified	-	-
Lake Vyrnwy	None identified	-	-
Lake Windermere	None identified	-	-
Fernilee Reservoir	None identified	-	-
Carlisle Resource Zone			
None	-	-	-
North Eden Resource Zone			
Bowscar Boreholes	Beacon Edge Borehole	Both options abstract from the same groundwater catchment, but with no adverse impacts anticipated	
	Cliburn Boreholes	Both options abstract from the same groundwater catchment, but with no adverse impacts anticipated	
	Eden Hall Boreholes	Both options abstract from the same	

Drought option	Existing licences within zone of influence	Potential for cumulative effects	Assessment summary
		groundwater catchment, but with no adverse impacts anticipated	
	Fairhill Boreholes	Both options abstract from the same groundwater catchment, but with no adverse impacts anticipated	
	Tarn Wood Boreholes#	Both options abstract from the same groundwater catchment, but with no adverse impacts anticipated	
Gamblesby Boreholes	None identified	-	
Tarn Wood Boreholes	Cliburn Boreholes	Both options abstract from the same groundwater catchment, but with no adverse impacts anticipated	

5.3 Cumulative Effects Between Drought Options (Intra-Zone)

Cumulative effects of each drought option with each other drought option on a one-on-one basis within each resource zone have been assessed and are summarised in the text and matrices in Sections 5.3.1 to 5.3.4. These assessments have been informed by the Drought Plan drought management option forms prepared by UU and mapping of locations of drought options, surface water and groundwater catchments.

5.3.1 Strategic Resource Zone

The matrix presented in **Figure 5.2** illustrates incompatible supply side and drought permit drought options and drought options with potential cumulative impacts in the Strategic Resource Zone.

Supply side options

No supply side options have been identified in the Strategic Resource Zone.

Drought permit options

Cumulative impacts of drought permit options were identified in Environmental Assessment Reports that have been prepared for each of the drought permit options (see Section 1.5). These include cumulative impacts resulting from concurrent implementation of:

- *Rivington Reservoirs – White Coppice and Rivington Reservoirs – Brinscall Brook.* The Environmental Reports concluded that the impacts of the options when implemented concurrently on hydrodynamics in the River Yarrow are anticipated to be of minor adverse.
- *Longdendale Reservoirs, Fernilee Reservoir and Dovestone Reservoir.* The Environmental Reports concluded that the impacts of the options when implemented concurrently on hydrodynamics in the River Goyt is predicted manifest as a 30% reduction in low floes in comparison to baseline drought conditions. Impact on the River Mersey (immediately downstream of the confluence between the River Goyt and the River Tame) are anticipated to be minor adverse.
- *Jumbles Reservoir and Delph Reservoir.* The Environmental Reports concluded that the impacts of the options when implemented concurrently on hydrodynamics in the River Tonge, River Croal and River Irwell (immediately downstream of its confluence with the River Croal) are anticipated to be moderate adverse.

Figure 5.2: Cumulative impacts matrix: Strategic Resource Zone

Supply Side and Drought Permit Options	Delph Reservoir	Dovestone Reservoir	Fernilee Reservoir	Jumbles Reservoir	Longdendale Reservoirs	River Lune LCUS abstraction	Rivington Reservoirs-Brinscall Brook	Rivington Reservoirs-White Coppice	Ullswater	Lake Vyrnwy
Dovestone Reservoir										
Fernilee Reservoir		■								
Jumbles Reservoir	■									
Longdendale Reservoirs		■	■							
River Lune LCUS abstraction										
Rivington Reservoirs-Brinscall Brook										
Rivington Reservoirs-White Coppice							■			
Ullswater										
Lake Vyrnwy										
Lake Windermere										

Legend:

	No cumulative effects identified
	Groundwater schemes: Both options abstract from the same resource, but with no adverse impacts anticipated
	Groundwater schemes: Both options abstract from the same resource, with adverse impacts anticipated
	Options with potential for groundwater-surface water interactions
	Surface water schemes: Both options affect the same resource but with no adverse impact anticipated
	Surface water schemes: Both options affect the same resource with adverse impact anticipated
	Surface water schemes: Both options affect the same resource and are sequential
	Groundwater-surface water schemes which are associated; if implemented, the groundwater option would alleviate pressure on the surface water option
	Uncertain – insufficient information available to undertake assessment

5.3.2 Carlisle Resource Zone

No drought permit options have been identified in the Carlisle Resource Zone.

5.3.3 North Eden Resource Zone

There are three drought permit options in the North Eden Resource Zone (Eden Valley boreholes). It is assumed these three permits would be applied for and implemented at the same time, therefore, an Environmental Assessment Report has been prepared and assesses the cumulative impacts, which are negligible..

5.4 Inter-Zone Cumulative Effects Between Drought Options

Assessment of the potential for cumulative impacts of supply side and drought permit options between water resource zones has been undertaken. Each supply side and drought permit/order option has been assessed for the potential for cumulative effects with each other supply side and drought permit/order option in other resource zones. These assessments have been informed by the Drought Plan drought management option forms prepared by UU and mapping of locations of drought options, surface water and groundwater catchments.

No cumulative inter-zone impacts were identified between drought options.

The potential for cumulative effects between the drought option at Ullswater (which is in the Eden catchment) and the Eden Valley Boreholes (Bowscar, Gamblesby and Tarn Wood Boreholes) was considered. The Environmental Assessment Report for the Eden Valley Boreholes drought permits concluded that cumulative hydrological impacts of all of the Eden Valley Boreholes drought option with the drought option at Ullswater are negligible (worst case in combination reduction of 0.08% of low flows); therefore, no cumulative effects between these drought options are anticipated.

5.5 Demand Management

5.5.1 Cumulative effects of demand management schemes

The matrix in **Figure 5.3** illustrates potential incompatibility and cumulative impacts between demand management schemes. An application for an ordinary drought order (non-essential use ban) would follow the implementation of water use restrictions (both voluntary and statutory).

Figure 5.3: Cumulative impacts matrix: demand management measures

Enhanced leakage detection and repair activity					
Campaign for voluntary water use restraint					
Temporary Use Ban (TUB)					
Ordinary Drought Order (Non-Essential Use Ban)					
Pressure management					
Demand Management Options	Drought publicity	Enhanced leakage detection and repair activity	Campaign for voluntary water use restraint	Temporary Use Ban (TUB)n	Ordinary Drought Order (Non-Essential Use Ban)

Legend:

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

5.5.2 Cumulative effects with supply side and drought permit options

Demand management options are consistent across the whole of UU's water supply region i.e. are not water resource zone specific. Demand management measures serve to reduce pressure on water resources and will have a positive influence on both supply side and drought permit options within each water resource zone by reducing customer demand for water, and therefore reducing the abstraction at source.

5.6 Eden Valley boreholes

The Eden Valley boreholes drought options comprises three boreholes (Bowscar, Gamblesby, Tarn Wood) which have the potential to impact on the River Eden SAC and therefore has been assessed cumulatively at the previous request of the Environment Agency[85]:

- Eden Valley boreholes (Bowscar, Gamblesby, Tarn Wood)
- Ullswater drought permit
- Castle Carrock Reservoir dead water[86].

The Environmental Assessment Report for the Eden Valley Boreholes drought permit concluded that cumulative hydrological impacts of all of the Eden Valley Boreholes drought option with the drought

[85] Olivier Barthélémy, Environment and Business Advisor - Water Resources, Environment Agency, *pers. comm.*
[86] Note the Environment Agency also requested consideration of any scheme with an impact on the River Gelt within this cumulative assessment, but no such scheme has been included as a drought option in UU's Drought Plan 2022.

option at Ullswater are negligible (worst case in combination reduction of 0.08% of low flows). As the Castle Carrock Reservoir dead water option does not include any changes to abstraction from the River Gelt or River Eden (option relates to utilisation of the dead water storage held within the reservoir itself only), no cumulative effects of this option with any other options are anticipated.

Overall, no cumulative effects of implementing the River Eden schemes concurrently are anticipated.

5.7 UU's WRMP Schemes

There are no resource management schemes identified within UU's WRMP 2019 that are due to be operational within the time period of the Drought Plan. There is a suite of leakage reduction and network metering actions being implemented. The demand management actions have potentially positive effects, as they will ultimately result in reduced abstraction at source, across all resource zones.

The Thirlmere Transfer scheme, identified in the 2015 WRMP, links UU's former West Cumbria Resource Zone to the Strategic Zone (see Section 1.3.3) and will be operational in 2022, and as such the construction phase of the scheme is not considered in this assessment.

An Environmental Impact Assessment, HRA Screening and statement of 'Information to Inform an Appropriate Assessment' (IIAA) were submitted in support of the Planning Application for the Thirlmere Transfer scheme. HRA Screening and the IIAA assessed the potential impacts of the operation phases of the scheme on Clints Quarry SAC, the River Derwent and Bassenthwaite Lake SAC, the River Eden SAC and the River Ehen SAC. The assessments concluded that assuming that all mitigation measures were implemented, then there would be no significant effects, either alone or in combination, on the Conservation Objectives or the qualifying features of the sites and thus no significant effect on site integrity. Therefore, no significant effects are anticipated in–combination with the drought options included in UU's Revised Draft Drought Plan 2022.

5.8 Environment Agency Drought Plans

Assessment of the potential for cumulative impacts of supply side and drought permit options with drought options listed in Environment Agency drought plans has been undertaken.

The information used to carry out these assessments is considered to be the most up to date information available at time of writing, but the assessments should be reviewed at the time of drought option implementation to ensure that no changes to Environment Agency drought plans have been made in the intervening period, and that the assessment, therefore, remains valid.

The following Environment Agency / Natural Resources Wales Drought Plans were reviewed:

- North West Operational Drought Plan (2020)
- Midlands Region Drought Plan (January 2012)
- Environment Agency Wales (now Natural Resources Wales) Drought Plan (January 2012).

Drought actions and triggers are given in the Environment Agency Drought Plans. Actions described in the Plans include communications (internal and external), monitoring and drought orders. Of these actions, those which are applicable for cumulative assessment with UU's drought options are external communications and drought orders. The other actions in the Plans relate to drought planning and monitoring and are not direct actions which would physically result in cumulative effects.

The Environment Agency[87] have previously advised that SEA of Environment Agency Drought Plans has not been undertaken, as these Plans do not meet the legal requirements for SEA because of their

[87] Mike Stokes, Environment Agency email to Kat Liney, Cascade Consulting, 7 September 2011.

voluntary status. However, the Environment Agency advised that when developing their plans they consider the principles behind SEA to help understand, assess and, where possible, mitigate the impacts of their drought management actions on the environment. Likewise, the Environment Agency advised that their Drought Plans do not contain actions / operations that could impact on a European site so have not undertaken HRA for their plans.

Drought Communications Plan (one of the actions in the Environment Agency's Drought Plans) may have positive cumulative effects with UU's drought publicity and campaign for water use restraint demand side options, as drought communication messages may reinforce each other, thereby resulting in increased demand savings.

Environment Agency drought order actions have the potential to have cumulative impacts with UU's drought options. The Environment Agency / Natural Resources Wales can apply to the Secretary of State / Welsh Ministers for drought orders for environmental reasons, e.g. if low flow is posing a risk to the aquatic environment. Environmental drought orders can be used to vary the compensation flow discharged from reservoirs in to the receiving rivers, provide measures to lower the controlled flow to conserve resources, or provide measures to reduce abstractions to ease demand on rivers and minimise the environmental effect of reduced support to river flow.

The Environment Agency / Natural Resources Wales can apply for an environmental drought order only if the environment is suffering serious damage as the result of abstraction during a drought. The Environment Agency North West Operational Drought Plan states that at compensation only reservoirs the precise reduction in compensation flow would be fully discussed between the Environment Agency, UU and NRW if necessary and would depend upon the need for additional water time of year and prevailing environmental circumstances. As a result it is hard to predict the location of all environmental drought orders in advance. However, a review following the 2018 drought assessed the likelihood of a drought order being needed at compensation only reservoirs, which was considered low at all sites other than the Upper and Lower Blackmoss reservoirs. No cumulative impacts with UU's drought options have been identified.

The Midlands Region Drought Plan states that the Environment Agency may in an exceptional drought situation apply to the Secretary of State for an environmental drought order on the River Severn to protect the freshwater flow in the river. Modification of the Vyrnwy compensation release is not listed in the Midlands Region Drought Plan as a condition of a potential River Severn drought order, however, it is noted that the Vyrnwy overdraft (waterbank) may be used to support the estuary, subject to other needs. The compensation flow and the Vyrnwy waterbank operate independently, and therefore, no cumulative effects of a potential UU drought permit at Vyrnwy and an Environment Agency River Severn environmental drought order are considered to be likely. Note that UU's Environmental Report for the Vyrnwy Drought Permit concluded no impact on the Severn Estuary SAC, and minor adverse hydrological impacts in the hydrological zone of influence of the scheme (to Llanymynech gauging station which is 200km upstream from the Severn Estuary SAC).

The Environment Agency Wales (now Natural Resources Wales) Drought Plan for North Wales states that there are no sites identified for environmental drought orders within the area and that the Environment Agency (now Natural Resources Wales) will apply for environmental drought orders if they prove necessary. The Plan notes that an environmental drought order was granted during the drought of 1995/6 to reduce the compensation discharge from Llyn Celyn reservoir. Since then the Dee General Directions have been revised and reissued (most recently in April 2009) to accommodate this. Note that UU does not have any drought options that result in modifications to abstractions on the River Dee, although several supply side drought options are groundwater sources which are in the vicinity of the River Dee. No impacts of these options on the River Dee have been identified and as such, no cumulative impacts of these groundwater sources are anticipated with any future potential environmental drought orders at Llyn Celyn.

In summary, no cumulative impacts of options in Environment Agency / Natural Resources Wales Drought Plans and UU's drought options are anticipated, however, due to the uncertainties of potential

locations, and potential revisions to the Environment Agency / Natural Resources Wales Drought Plans this should be considered further at the time of any potential application for drought permits by UU and the Environment Agency / Natural Resources Wales.

5.9 Other Water Company Drought Plans

Assessment of the potential for cumulative impacts of supply side and drought permit options with drought options listed in neighbouring water companies' drought plans has been undertaken.

It should be noted that all water company Drought Plans are subject to review on timescales that may not be aligned with the timescale of UU's Drought Plan revision. The information used to carry out these assessments is considered to be the most up to date information at available at time of writing, but the assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought options has been made in the intervening period, and that the assessment, therefore, remains valid.

The assessments have been informed by Drought Plan drought management option forms prepared by UU and mapping of locations of drought options, surface water and groundwater catchments. As stated above, the assessment has used the most recent information available on neighbouring water company Drought Plans.

Dŵr Cymru Welsh Water

No cumulative impacts between drought options in UU's Drought Plan with Dŵr Cymru Welsh Water's 2020 Drought Plan which would have potential for impact on European sites have been identified, UU's only drought option in Wales is Lake Vyrnwy and an Environmental Report has been prepared for this drought option which did not identify cumulative impacts with any other water company abstraction licence.

Severn Trent

An Environmental Report has been prepared for UU's Lake Vyrnwy drought option and concluded that the hydrological influence of the drought option extends to Llanymynech gauging station on the Afon Vyrnwy (i.e. upstream of the confluence of the Afon Vyrnwy with the River Severn and 200km upstream from the Severn Estuary SAC).

None of the drought options in the Severn Trent Water 2018 Drought Plan affect the hydrological zone of influence of the Lake Vyrnwy drought permit, and therefore, no in-combination impacts of Severn Trent's drought options with UU's drought option on European sites (including the Severn Estuary SAC) have been identified.

Yorkshire Water

No cumulative impacts between drought options in UU's Drought Plan with Yorkshire Water's 2019 Drought Plan which would have potential for impact on European sites have been identified.

Northumbrian Water

No drought permit options were included in Northumbrian Water's 2019 Drought Plan. All supply side options would be within existing licensed limits. No cumulative impacts between drought options in UU's Drought Plan with Northumbrian Water's Drought Plan which would have potential for impact on European sites have been identified.

Scottish Water

In England, the water companies have a statutory duty under the Water Act 2003 for the production of drought plans. Scottish Water currently has a duty under the Water (Scotland) Act 1980 to promote the conservation and effective use of the water resources of Scotland and they are presently in the process of producing drought plans for their strategic sources which they will subsequently agree with the Scottish Environmental Protection Agency and Scottish Natural Heritage.

Hafren Dyfrdwy

A supply-side option aimed at augmenting flows in the River Dee was the only supply side measure included in the Drought Plan 2019. No cumulative impacts between drought options in UU's Drought Plan with Hafren Dyfrdwy Drought Plan which would have potential for impact on European sites have been identified.

5.10 National Policy Statements

National Policy Statement for Water Resources Infrastructure[88]; sets out the need and policies for development of nationally significant infrastructure projects (NSIPs) for water resources in England. No cumulative effects with UU's drought options have been identified.

National Policy Statement for Wastewater[89]; states the policy of reducing demand for wastewater infrastructure by reducing domestic and industrial wastewater production and by implementation of Sustainable Urban Drainage Systems. Only two major infrastructure projects are put forward, both in the south east of the UK. No cumulative effects with UU's drought options have been identified.

National Policy Statement for Renewable Energy Infrastructure[90]**;** covers the following types of nationally significant renewable energy infrastructure; energy from biomass and/or waste (>50 megawatts (MW), offshore wind (>100MW) and onshore wind (>50MW)). Other types of energy generation including hydropower are not included. No cumulative effects with UU's drought options have been identified.

National Policy Statement for Nuclear Power [91]**;** identifies potentially suitable sites for the deployment of new nuclear power stations in England and Wales. Two sites, Heysham and Sellafield, are located within the United Utilities Strategic Resource Zone. No cumulative effects with UU's drought options have been identified.

A number of NSIPs listed on the Planning Inspectorate website are located within the United Utilities supply area. No cumulative effects with UU's drought options have been identified.

[88] Defra (2012) Draft *National Policy Statement for Water Resources*. November 2018.
[89] Defra (2012) *National Policy Statement for Wastewater*. March 2012.
[90] Department of Energy and Climate Change (2011) *National Policy Statement for Renewable Energy Infrastructure (EN-3)*. July 2011.
[91] Department of Energy and Climate Change (2011) *National Policy Statement for Renewable Energy Infrastructure (EN-3)*. July 2011.

6 Mitigation and Monitoring

6.1 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 1.6**). The sections below describe how these tasks have been addressed and how UU 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 can be assessed.

6.2 Mitigation

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

Consideration of mitigation measures has been an integral part of the SEA process. The methodology for the assessment of the drought options is provided in Section 3. 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 environmental assessment reports, where available (see Section 1.5) or UU's drought management option forms, within the Drought Plan, 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[92], the SEA appraisals have assumed the implementation of reasonable mitigation, such as the use of good construction practice. This is particularly applicable to stood down 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.
- Mitigation is an implicit component of abstraction licences which are issued and reviewed by the Environment Agency based on an assessment of the potential impacts on the environment. This is applicable to all supply-side options which are actions within existing abstraction licence limits which have been subject to the Environment Agency's Review of Consents process.

As described in Section 6.3, during implementation of a specific drought option, appropriate monitoring will be undertaken to track any potential environmental effects which will in turn trigger deployment of suitable and practicable mitigation measures.

6.3 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.

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

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

UU's Revised Draft Drought Plan 2022 includes a range of possible measures to allow UU 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 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.

Environmental Assessment Reports have been prepared for all of UU's drought permit options (see Section 1.5). These reports include an Environmental Monitoring Plan. Discussions between UU, the Environment Agency, Natural England and Natural Resources Wales have been held to agree the baseline, in-drought and post-drought monitoring required at each drought permit site (based on the Environmental Monitoring Plans contained within the environmental reports). EMPs for all sites are reviewed and shared with the EA annually.

As described in the Revised Draft Drought Plan 2022, in the event of a drought requiring the implementation of drought option(s), UU will review the requirement for environmental monitoring in consultation with the Environment Agency, Natural England and Natural Resources Wales (as appropriate).

7 Summary

7.1 Introduction

SEA of UU's Revised Draft Drought Plan 2022 has been undertaken. The Drought Plan provides a comprehensive statement of the actions UU will consider implementing during drought conditions to safeguard essential water supplies to customers and minimise environmental impact.

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 bespoke reaction in terms of measures. In the context of drought planning, individual drought options are taken to constitute alternatives. UU's Revised Draft Drought Plan 2022 comprises a total of 22 drought options (one supply side option, six demand options and 15 drought permit sites).

The purpose of SEA is to provide high level and strategic protection of the environment by incorporating environmental considerations into the preparation of plans and policy. The SEA assists in the identification of the likely significant environmental effects of UU's drought options and determines how any adverse impacts might be mitigated. The SEA also 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.

SEA Screening confirmed that UU's Revised Draft Drought Plan 2022 required both SEA and HRA. The HRA of UU's Revised Draft Drought Plan 2022 has been undertaken in parallel with the SEA and is reported separately in the HRA Screening Report. The HRA screening process identifies whether each drought option in the drought plan (either alone, in combination or with other plans or projects) is likely to have significant effects on European designated sites, i.e. sites of international conservation importance. The findings of both the SEA and HRA have fed into the revision of the Drought Plan in an iterative process.

The SEA and HRA have been guided by a Project Steering Group of representatives from Natural England, the Environment Agency, Historic England, Natural Resources Wales and Cadw. A SEA Scoping Report was issued in March 2020, and provided an opportunity for the statutory consultees to provide views on the proposed scope and level of detail of this SEA Environmental Report. Issues raised by consultees have been considered in preparing this report.

The findings of the SEA are presented within this Environmental Report, which accompanies UU's submission of the Revised Draft Drought Plan 2022 to Defra and the Welsh Government.

7.2 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; 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.

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 (both intra- and inter- water resource zone) and in combination with the implementation of other relevant plans and programmes.

7.3 Findings of the Assessments

The findings of the SEA of each drought option is summarised below.

Supply side options

Minor construction works are required to bring Castle Carrock back into operation and few residual environmental effects are anticipated. Operationally, the supply side option is within existing licensed abstraction limits and it is assumed that the existing abstraction licence would not have been granted if these options resulted in unsustainable abstraction. Overall, most of the impacts of implementing this option are anticipated to be negligible or minor adverse, with minor beneficial impacts associated with benefits to security of public water supply and climate change adaptation.

Demand side options

Demand side measures serve to reduce pressure on water resources by reducing customer demand for water, and therefore reducing the abstraction at source. This will in turn contribute to reducing the amount of energy needed for water abstraction, treatment and distribution. Overall, impacts for these drought options are considered to be negligible to major beneficial. Adverse impacts on population and human health were associated with options involving water restrictions.

Drought permit options

The magnitude of impacts on SEA objectives for drought permit options (i.e. where there is modification to the conditions of an existing abstraction licence) varies between and within the options, ranging from major beneficial for the SEA objective for population and human health, to minor adverse for the SEA objective for biodiversity, flora and fauna. The latter were associated with adverse changes to surface water levels and flows.

7.4 Cumulative impacts

The cumulative, or in-combination, assessment identified the potential for adverse impacts if two drought options were to be implemented at the same time, either intra- or inter- water resource zone. In the majority of combinations, no impacts are considered likely, however, in some cases, impacts have been identified where, for example, both options draw on the same water resource (e.g. same groundwater catchment or same river). Due to the uncertainty of timing of implementation of drought options, assessments of each drought option with each other drought option have been undertaken with the intention that in the event of a drought, the findings of the SEA 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.

Assessment of UU's Revised Draft Drought Plan 2022 with other plans and programmes, including UU's WRMP, Environment Agency / Natural Resources Wales Drought Plans, other water company Drought Plans and National Policy Statements, concluded that no significant cumulative, or in-combination, effects are anticipated.

7.5 Mitigation and Monitoring

Consideration of mitigation measures has been an integral part of the SEA process. The SEA appraisals have been based on residual impacts, i.e. those impacts likely to remain after the implementation of reasonable mitigation.

During implementation of one or more drought options, appropriate monitoring will be undertaken to track any potential environmental effects which will in turn trigger deployment of suitable and practicable mitigation measures. Prior to implementation, UU will review the specific requirements for environmental monitoring in consultation with the Environment Agency, Natural England and the Natural Resources Wales.

7.6 Going Forward

The Draft Drought Plan 2022 and the SEA Environmental Report have been issued for public consultation. Comments received through this consultation have been incorporated in a Revised Draft Drought Plan, and, where appropriate to do so, these changes have been assessed using the approach to SEA set out in this report. The Revised Draft Drought Plan will subsequently be published as a Final Drought Plan and an SEA post-adoption statement prepared. When the Drought Plan is implemented during an actual drought event, UU will monitor its effects on the environment, helping to ensure that the potential impacts identified in the SEA are considered in practice.

Appendix A: Summary of Construction Activities Required for Supply-Side Drought Options

This Appendix provides a summary of the construction activities required in order to bring each of the supply side drought options into operation.

This Appendix consists of two tables.

Table A1 outlines the key work elements required for each drought option, including an 'Activity Reference'.

Table A2 provides construction details relating to each 'Activity Reference', including plant and vehicle movements and the basic materials required.

Table A1 Summary of Construction Activities for Supply Side Option

Site	Scope	New borehole pumps /rising main	New mechanical and electrical works	Disinfection plant	UV plant	Acid dosing	Filter plant	Temporary pumping station	Existing WTW refurbishment	New Pipeline	Slipline maintainance	Activity Ref (see Table A2)
Carlisle Resource Zone												
Castle Carrock Reservoir dead water storage	Install temporary pumping equipment into reservoir in order to utilise dead storage (170 Ml) below Trigger 4, new pumps and rising main, modifications to include a temporary filter plant at the front of the works						X	X				7,8

Table A2 Construction Activities

Activity Ref	Activity	Scope	Traffic	Materials
1	New borehole pumps /rising main	Removal of existing borehole pump and rising main and replacement/renewal as needed. Use of mobile crane.	General construction (e.g. transit pick-up truck): 4 trips per day for 1 week Mobile crane: on-site for 1 week Pipe delivery: 1 HGV visit Pump delivery: 1 HGV visit	Pipes: length of rising main, assume 150mm diameter PE Borehole pump(s)
2	New mechanical and electrical works	Replacement or relocation of power supply/starter panel.	General construction (e.g. transit pick-up truck): 4 trips per day for 2 days Panel delivery: 1 HGV visit	Starter panel
3	Disinfection only plant > 5 Ml/d	Construction of concrete base and temporary building (~6mx4m) including access track. Installation of disinfection rig including tapping into existing pipework.	General construction (e.g. transit pick-up truck): 4 trips per day for 3 weeks Excavator (e.g. JCB): on site 2 week Sub-base delivery: 2 HGV visits Concrete delivery: 2 HGV visits Building/Rig delivery: 1 HGV visit Mobile crane: on-site for 1 week	Hardcore: ~ 20t Concrete: ~10m^3 Temporary building (6mx4m) Disinfection rig including control equipment Hypochlorite storage
4	Disinfection and UV plant Up to 5 Ml/d	Construction of concrete base and temporary building (~3mx4m) including access track. Installation of disinfection/UV rigs including tapping into existing pipework.	General construction (e.g. transit pick-up truck): 4 trips per day for 3 weeks Excavator (e.g. JCB): on site 2 weeks Sub-base delivery: 2 HGV visits Concrete delivery: 2 HGV visits Building/Rig delivery: 2 HGV visits Mobile crane: on-site for 1 week	Hardcore: ~ 15t Concrete: ~10m^3 Temporary building (3mx4m) Disinfection/UV rigs including control equipment Hypochlorite storage
5	Disinfection and UV plant > 5 Ml/d	Construction of concrete base and temporary building (~6mx4m) including access track. Installation of disinfection and UV rigs including tapping into existing pipework.	General construction (e.g. transit pick-up truck): 4 trips per day for 4 weeks Excavator (e.g. JCB): on site 2 week Sub-base delivery: 3 HGV visits Concrete delivery: 3 HGV visits Building/Rig delivery: 2 HGV visits Mobile crane: on-site for 2 weeks	Hardcore: ~ 25t Concrete: ~12m^3 Temporary building (6mx4m) Disinfection/UV rigs including control equipment Hypochlorite storage

Activity Ref	Activity	Scope	Traffic	Materials
6	Acid dosing	Construction of concrete base for dosing rig/M&E and building (~3mx4m) including access track. Installation of acid rig including tapping into existing pipework.	General construction (e.g. transit pick-up truck): 4 trips per day for 2 weeks Excavator (e.g. JCB): on site 2 weeks Sub-base delivery: 2 HGV visits Concrete delivery: 2 HGV visits Building/Rig delivery: 2 HGV visit Mobile crane: on-site for 1 week	Hardcore: ~ 20t Concrete: ~10m^3 Temporary building (3mx4m) Disinfection rig including control equipment Chemical storage
7	Filter plant	Construction of concrete base for pre-fabricated filtration plant and M&E building (~3mx4m) including access track. Installation of acid rig including tapping into existing pipework.	General construction (e.g. transit pick-up truck): 4 trips per day for 4 weeks Excavator (e.g. JCB): on site 3 weeks Sub-base delivery: 4 HGV visits Concrete delivery: 4 HGV visits Building/Rig delivery: 10 HGV visit Mobile crane: on-site for 1 week	Hardcore: ~ 30t Concrete: ~10m^3 Temporary building (3mx4m) Filtration plant including control equipment Chemical storage
8	Temporary Pumping Station	Construction of concrete base and temporary building (~3mx4m) including access track. Installation of pump-sets/M&E including tapping into existing pipework.	General construction (e.g. transit pick-up truck): 4 trips per day for 2 weeks Excavator (e.g. JCB): on site 1 week Sub-base delivery: 3 HGV visit Concrete delivery: 1 HGV visit Building/Pump/Generator delivery: 3 HGV visit Mobile crane: on-site for 1 week	Hardcore: ~ 30t Concrete: ~5m^3 Temporary building (3mx4m) Generator Pumps
9	Existing water treatment works refurbishment	Refurbish slipline/ filters/media/chemical dosing at existing works.	General construction (e.g. transit pick-up truck): 4 trips per day for 6 weeks General materials delivery: 12 HGV visits Mobile crane: on-site for 3 weeks	Filter media Pipework/dosing equipment
10	Temporary pipeline and pumping station	Installation and removal of temporary overland PE pipeline (3km 180mm PE). Temporary diesel pumps.	General construction (e.g. transit pick-up truck): 4 trips per day for 6 weeks Excavator (e.g. JCB): on site 3 weeks Sub-base delivery: 10 HGV visits Concrete delivery: 4 HGV visits Pump/fittings delivery: 2 HGV visits Pipe/fittings delivery/removal: 30 visits Mobile crane: on-site for 1 week	3km 180mm diameter PE80 pipe Diesel pumps 30 l/s @ 77m head Temporary fencing: 250m Sub-base material: ~ 50t Concrete: ~ 20m3

Activity Ref	Activity	Scope	Traffic	Materials
11	New Main	Construction of new supply pipeline.	General construction (e.g. transit pick-up truck): 4 trips per day for 6 weeks Excavator (e.g. JCB): on site 6 weeks Pipe surround deliveries/removal: 100 HGV visits Concrete delivery: 6 HGV visits Pipe/fittings delivery: 12 visits	

Appendix B: Statutory Consultee Responses to the 2020 SEA Scoping Report

Comments on the SEA Scoping Report, received from the **Environment Agency** on the 22nd March 2020, have been listed below. No comments were received from Natural Resources Wales, Historic England or Cadw. Comments were received from Natural England relating the the wider Drought Plan process.

Comment		**UU/Ricardo Response**
1	Table 1.3 seems to refer still to Windermere scenario 2 – we thought that option had now been removed.	Table 1.3 lists the options in the 2018 DP. As noted in the text above Table 1.3 UU are currently reviewing the options for 2021 plan
2	Pleased the need for UU to provide env assessment reports, monitoring plans and mitigation now for compensation only reservoirs is clarified.	Noted.
3	Section 2.3.4.1, 2.3.4.3, and Table 2.10 all refer to protect, maintain and enhance biodiversity which is welcomed but they then limit the focus of this onto designated sites. In order to comply with NERC Act this requirement needs to stretch beyond the designated site network and include all priority species and habitats even if they are undesignated or only have local non statutory designation.	While the initial portion of the baseline section focuses on designated sites, we provide a summary of other species and habitats in this section, as well as the Future baseline section. The key issue '•*The need to protect, maintain or enhance biodiversity, ecological functions and biodiversity connectivity within UU's supply and source areas, particularly protected sites designated for nature conservation.*' does not limit the focus of the assessment to designated sites only as we acknowledge the importance of all species and habitats. We would also note that the Environmental Assessment Reports which inform the SEA of each drought permit option includes comprehensive consideration of non-statutory sites (e.g. local wildlife sites) and prirority habitats and species.
4	Table 3.1 under the Air and climate section misses an opportunity to raise key considerations for UU's contribution to greenhouse gas sequestration e.g. through land management of catchment areas, tree planting, peat restoration, sensitive reservoir management	UU recognise the importance of catchment management interventions e.g. peat restoration, tree planting and have committed to continuing to work in these areas. However, the Drought Plan sets out short term actions undertaken in drought

		situations, and these are not relevant to long term land management issues.
5	The targets listed for climate change adaptation and emissions reductions is slightly out of date. The report refers to the old target of reducing greenhouse gas emissions to 80% of 1990 levels however this has now been superseded by the target of net zero by 2050.	The targets listed for climate change adaptation and emissions reductions have been updated to take into account the target of net zero by 2050 (Table 2.2 Key Policy Messages & Table 3.1 SEA Objectives Air & Climate topic; Appendix A Climate Change Act 2008) .
6	On page 21, the SEA refers to Environment Agency (2015) Greater Manchester, Merseyside and Cheshire Drought Plan. The most recent version of this is the Environment Agency (2018) North West Drought Plan. Danielle Talboys can send a version if needed, however, is currently finalising the updated drought plan hopefully in May, will it be too later to add this instead?	We will update the reference and utilise the more recent May 20 version for the assessment, which we now have a copy of.
7	S 1.1 – I'd like to understand a bit more about why "it has been determined that SEA & HRA are required" – I don't disagree but would just like to know more of the thinking behind this (especially given assumption that Ennerdale drought order is not in the new plan)?	The list of drought options has yet to be determined, so given this uncertainty there 'is potential for impacts on a European designated site which triggers the requirement for Appropriate Assessment under the Habitats Regulations 2017'
8	S 2.4 – Table 2.10 – some feel more WRMP-oriented - e.g. affordability, increasing population – rather than WCDP-related. Generally, it is a big list so maybe the company/consultants should prioritise and focus on aspects that the drought plan / drought actions really impact on (water env, fish/fauna, carbon maybe)?	We agree that some of these key messages are more relevant to WRMP assessment and have amended those in the Population and Human Health topic and Soil, geology and land use Topic.
9	S3 – Tables 3.1 and 3.2 – linked to my comment above, I'd like to see more detail focus on WFD i.e. not lumping GEP/GES and No Det together but separating out plus adding Groundwater Quantitative	The plan level nature of the assessment requires that both SEA objectives and 'key questions' are applicable to a broad range of drought options and encompass broad

	status as a key question in its own right. If I knew more about it (!) I'd probably say the same about impacts on salmonids / salmon action plan objectives etc as this may be significantly impacted by drought actions I think. So similar comments on Tables 3.1 and 3.2 here.	topics. We consider that as SEA objectives 4.1-4.3 all incorporate consideration of WFD and that these will ensure any relevant impacts are identified in the assessment.
10	S 3.2.1.2 – where impacts are uncertain, company and consultants should consider how important that is in the overall option assessment and (if necessary) collect data/info/monitor to provide that certainty in future assessments / plans. (so not just say "it is uncertain" every time the planning cycle comes round if it is important)	Where significant uncertainties remain following a review of all available information it is noted that the DPG requires UU to set out how these uncertainties will be reduced e.g. if further baseline data collection is required, and this will be covered in any proposed monitoring.
11	S 4.2 – what drought scenario(s) / worked example(s) is the company going to use to test the plan against the SEA objectives?	All drought options to be included in the draft Drought Plan will be assessed against the SEA objectives. If the list of drought options is modified following the SEA outcomes/other workstreams then new/revised options will be assessed and cumulative assessments revised as appropriate.
12	S 4.3 – suggest they keep the background bit (Section 1 of the draft structure) to a minimum – perhaps just hyperlink/refer to the same info in the drought plan itself rather than repeating it in the SEA report?	The report will be kept as concise as possible while retaining all required information.
13	General question – how will "more before level 4" extreme drought options be considered in the SEA process?	As above, any options to be included in the draft Drought Plan will undergo assessment against SEA objectives.
14	S 1.1: Assessments will not just assist in identification of preferred measures but should also be used to determine the preferred order or implementation, considering environmental risk (as emphasised in EA's latest guidance).	Agreed that this is a key area in which SEA can influence drought planning.

15	S1.3.1: Not all lessons learned were incorporated in August 2019 given timescales, further lessons from the 2018 dry weather will be incorporated into the new drought plan.	Noted.
16	S1.3.2: Step 4 of flow chart – would be good to have detail on where UU see the potential for impacts on European designated sites. What made this a yes?	As above.
17	S1.3.3: Yes nature of triggers varies, however, note EA's latest guidance expectation that there is standardised meaning for trigger zones.	Noted, and this will be reflected in the draft Drought Plan.
18	S1.3.3.1: Recommissioning would also require assessment of impacts, as would other significant change to normal operational abstraction, even when it isn't drought permit site. o Table 1.1: Tankering subsequently removed in August 2019.	The SEA incorporates assessment of all supply side options, including non-drought permit/order options. Where appropriate/relevant this includes consideration of both construction and recommissioning phases. Section 3.1 has been amended to clarify that in addition to construction information/details there will be a requirement to review details for plans on recommissioning.
19	S1.3.3.2: table 1.2 Formatting is strange. Where is Temporary Use Ban and appeal for restraint?	The title of Table 1.2 has been amended to clarify this is the list of options in the 2018 DP. The option 'drought publicity' incorporates appeal for restraint and the option 'Water Use Restriction' incorporates TUBs.
20	S1.3.3.3: Agree any other drought permit/order options identified should be included. o On CORs – suggest rewording on UU's responsibility in final paragraph – something like "As UU would not be the party applying for a drought order for a COR, the SEA and HRA assessments will not cover these"	Agreed and this has been amended.

21	S1.4: Typo in p3 “revision” should be “revising”	This error has been corrected.
22	S1.5.2: Reiterate point about assessment helping to determine order of implementation according to risk.	Section 1.5.2 has been amended to include the italic text: 'The outputs of the SEA will provide a comparative assessment of the environmental effects of implementing each drought option, which can be used by UU to advise the bespoke measures to be implemented at the time of an actual drought event, *and be used to inform the preferred order of the implementation according to its risk*.'
23	S1.5.3 – should include first para in intro.	The first paragraph of Section 1.1. includes the sentence 'It has been determined that Strategic Environmental Assessment (SEA) and a Habitats Regulations Assessment (HRA) of the Drought Plan are required.'
24	Table 2.2, page 21, typo “gain gain”. Also likely to cause spread of INNS… or increase risk of spread.	This typo has been correct and the key message has been reworded.
25	S2.3.4.2: Are we clear on what is meant by allowing wildlife to adapt to climate change?	The improvement in habitat and habitat connectivity is key to allowing wildlife to adapt to long term climatic changes, and therefore the protection and avoidance of damage to existing habitats is refered to here.
26	S2.3.5.1: Typo in para 3 of population – 20334 Health & deprivation – not just alterations to infrastructure but also restrictions to water use.	The typo has been corrected and the text 'and restrictions to water use' has been added.
27	S2.3.5.2: Need to accommodate for an increasing population and households (with occupancy rates per household reducing?)	Text has been amended.

28	S2.3.6.1: Quote WRMP19 not WRMP15	The reference has been amended to refer to WRMP 19.
29	Table 2.4: Fine although national framework may have more up to date data?	The 2017 data as reported in 2019 has now been included in the report.
30	S2.3.6.2 o General Q: Are you saying baseline for drought plan 2021 assume WRMP19 baseline rather than signed off, published preferred plan? o Think Average water use figure needs updating o Leakage – how much room is there for enhancement given stretching forecasts o Maintaining SELL is surely old plan – latest baseline would reflect WRMP19 signed off plan?	The 'predicted future baseline' does not refer to the baseline used for WRMP19, but rather it incorporates activities assumed to be taking place in the future, in this case in regards to leakage control. The enhanced leakage control relates to activity as specified in the 2018 DP. The leakage reductions proposed in the WRMP 19 are now referred to in the text rather than the 2019 Annual Water Resources Review.
31	S2.3.7.1: Wording on UU's wider operations in Wales – why phrasing as "issue"? Also note that if your operational use significantly changes during a drought but it doesn't require a drought permit, the environmental impacts of the changes should still be considered.	The SEA will assess all options in the drought plan, and the wording simply refers to the lack of any supply side options in the plan which are located in Wales.
32	S2.3.7.3: Need to improve resilience, flexibility & sustainability – this is welcomed and ambitions on environmental implications to be explored through WRW	Noted.
33	S2.3.9.1: Have UU made business commitments on CO2 emissions (i.e. a net zero target?)	By 2035 UU aim to reduce their greenhouse gas emissions by 60%. https://www.unitedutilities.com/corporate/responsibility/environment/climate-change/
34	S3.1: Will "likelihood and predicted frequency of deployment" be available for all measures including use of reserve/drought sources, demand restrictions and the various drought permits/orders?	This information on likelihood and liklihood of deployment is related to the triggers and is included in the Appendix 9 Drought option forms (related to Triggers)

35	o Page 55 – Natural Capital – given there hasn't been Natural Capital appraisal undertaken how will this be answered. Consider the question "Will it protect or enhance natural capital and ecosystem services?" very broad, and unclear how this can be answered effectively.	The nature of SEA means that a high level assessment is required and broad questions needs to be answered with as much confidence as is possible with the available information.
36	o Page 57: Is green infrastructure network well defined/accepted. Not clear exactly what it covers.	The definition of green infrastructure varies across English regions, however the main categories, as stated in the Natural England Green Infrastructure Guidance, include; parks and gardens, amenity greenspace, natural and semi-natural urban greenspaces, green corridors and other.
37	o Page 58: In terms of reduce greenhouse gas emissions, note that this can very much be choice of company as to energy supplier choice. Is UU committed to renewable energy only provider?	UU's energy strategy aims to achieve an appropriate balance between managing our energy consumption, use of renewables and self-generation and being smart about how we operate our assets to get best value while maintaining security of supply. In 2018/19 173GWh of renewable electricity was generated, an increase of 6GWh on the previous year. This was achieved with a mix of generation from wind, hydro, solar photovoltaics and energy recovery from bioresources. UU continues to invest in it's generation capability with nine new solar installations coming on line during the year. Most of the energy we generate is used to power our operations, but where there is excess or it makes commercial sense to do so we export to the grid. We are exploring emerging technologies such as batteries and electric vehicles and investigating how systems thinking and artificial intelligence might optimise our energy use and generation. For

		further information please got to our website: https://www.unitedutilities.com/corporate/responsibility/environment/climate-change/
38	o Page 59: Will it abstract from water with resource availability – will this be checked for all drought actions? Do UU have access to CAMS data or will use licensing strategies?	All drought options will be assessed against all SEA objectives and all key questions are asked. The SEA will use licencing strategies.
39	o Page 59: Will it affect RBMPs? This doesn't mean much as a question. Redefine – i.e. contribute /impact on ability to meet objectives of RBMPs?	Wording has been amended
40	o Page 62: typo – "in an areas sensitive to emissions"	Corrected.
41	o Page 64: OUV – spell out	Corrected.
42	•S3.2.1 o Remove error note o Reference alignment to EA latest guidance on value and sensitivity of receptors o There are numerous drought options that do not have EAR prepared. These will be at more risk of limited info. o I do not think expert judgment is accepted approach to minimizing uncertainty. Expert judgment	Clarification as to which EA guidance is referred to would be appreciated, is this the DPG supplementary advice? An SEA differs from project level assessment (e.g. EIA) as it is dependant on qualitative information, limited plan level quantitative information, and professional judgement. Where assumptions have been made these are documented in the report for review.

	will be used in the assessment to categorise and manage the varying levels of uncertainty? o Broad measures to prevent, reduce, and as fully as possible offset effects – what about mitigate? (Offset/compensate is last resort).	The use of offsetting and compensation is noted as being a last resort, with prevention and reduction (mitigation) employed prior to consideration of offsetting/compensation.
43	• Table 3.3: On aggregate potential impact, how is it determined? Could have more info, assume its in line with UKWIR guidance but would be good to understand further. o Will there be independent audit and measure to ensure consistency with other water companies? (E.g. through regional groups).	The methodology is fully in alignment with the UKWIR guidance. The impact is assigned per objective and is determined through use of the specific key questions for each objective and consideration of the scale/certainty/duration/permanence/magnitude of the effects and the sensitivity/value of the receptors. No audit is proposed.

Appendix C: Review of Plans and Policies

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 this Scoping Report. This table sets out the purpose and objectives of the policy, plans and programmes, their potential relationship with UU'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*	
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.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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 UU 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.
EC 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 (2014) The EU Regulation on invasive alien (non-native) species 1143/2014	
This Regulation imposes restrictions on a list of species known as "species of Union concern". These are species whose potential adverse impacts across the EU are such that concerted action across Europe is required. The IAS Regulation provides for a set of measures to be taken across the EU in relation to invasive alien species included on the Union list. Measures fall under three categories including; prevention, early detection and rapid eradication and management.	Drought options may introduce a risk of spreading invasive alien (non-native) species. The SEA should include an objective relating to INNS.
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	The implementation of the Drought Plan may influence biodiversity in the UU area and as

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
biodiversity loss by 2020. It reflects the commitments taken by the EU in 2010, within the international Convention on Biological Diversity.	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 discretion of each Member State (in the UK delivery is via several different statutes).	The SEA should seek to protect and conserve important bird habitats.
European Commission (2009), *Promotion of the use of energy from renewable sources Directive (2009/28/EC)*	
This promotes the use of energy from renewable sources.	The SEA should take account of the need to seek to promote the use of renewable energy.
European Commission (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 determineation 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 dixide (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)*	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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)*	
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 north west 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)*	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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)*	
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.
European Commission, The Bathing Waters Directives Council Directive 76/160/EEC of 8 December 1975 concerning the quality of bathing water and Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
The Bathing Waters Directives include mandatory standards for the quality of bathing waters (excluding water indented for therapeutic bathing purposes and water used in swimming pools). It sets the minimum quality criteria to be met by bathing water: • The physical, chemical and microbiological parameters • The mandatory limit values and indicative values for such parameters; • The minimum sampling frequency and method of analysis or inspection of such water. In March 2006, a revised Bathing Water Directive was adopted and become law in the UK in March 2008. As well as stricter water quality standards, it contains a requirement to provide more detailed and standardised information about bathing waters across Europe. Directive 2006/7/EC will repeal the Directive 76/160/EEC in 2014.	The DP will need to comply with set limits. The SEA assessment should take into account the effects of options on the water quality at designated bathing waters.
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: • Conservation of biological diversity • Sustainable use of its components • Fair and equitable sharing of benefits arising from genetic resources	The commitment to conserving biological diversity must be considered in any DP 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

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
	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.
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. Under The Climate Change Act 2008 (2050 Amendment) Order 2019 the UK is required to reduce all greenhouse gas emissions to net zero by 2050.	This target needs to be taken into account by the SEA.
Cadw, CCW and ICOMOS (UK)(International Council on Monuments and Sites) (2001), Register of Landscapes of Historic Importance	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Two-volume Register of Landscapes of Historic Interest in Wales. This advisory and non-statutory document highlights what are considered to be the best examples of different types of historic landscape in Wales and was the first step towards raising the profile of historic landscapes in Wales.	The DP and SEA should consider and take account of any potential impacts to heritage landscapes and assets.
Conservation of Habitats and Species Regulations 2017	
These regulations consolidate all the various amendments made to the Conservation (Natural Habitats) Regulations 1994 in England and Wales. 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 and Wales 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.
Countryside Council for Wales (CCW) (2003), *Priority Habitats of Wales*	
Gives information about Wales' priority habitats, as identified by UK Biodiversity Action Plans.	The DP and SEA objectives will need to consider the protection of priority habitats.
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	
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 United Utilities supply area.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Department of Energy and Climate Change (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity	
This white paper outlines a package of reforms so that by 2030 there will be a flexible, smart and responsive electricity system, powered by a range of low carbon sources of electricity. This includes engaging with consumers on energy use. Decarbonisation is important in meeting the 2050 targets.	The implementation of the DP may have an influence upon United Utilities total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
Department for Energy and Climate Change (2007) Energy White Paper: Meeting the Energy Challenge	
Meeting the energy challenge', sets our international and domestic energy strategy, in the shape of four policy goals: • Aiming to cut CO2 emissions by some 60% by about 2050, with real progress by 2020 • Maintaining the reliability of energy supplies • Promoting competitive markets in the UK and beyond • Ensuring every home is heated adequately and affordably.	The implementation of the DP may have an influence upon United Utilities' 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 (2016) Creating a great place for living	
In 2016 Defra produced a report that set out objects to great a great place for living, The objectives are related to the following topics: • Environment – a cleaner, healthier environment, benefiting people and the economy; • Food and farming – a world-leading food and farming industry; • Rural – a thriving rural economy, contributing to national prosperity and wellbeing; • Protection – a nation better protected against floods, animal and plant diseases and other hazards, with strong response and recovery capabilities; • Excellent Delivery – Excellent delivery, on time and to budget with outstanding value for money; • An outstanding organisation – an organisation striving to be the best, focused on outcomes and constantly challenging itself.	The SEA must take into account impacts of the 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 (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	Outputs from the SEA process will help to inform any future potential development by United Utilities 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,

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.	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 north west and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
Defra and Natural England (2014) Biodiversity duty: public authority duty to have regard to conserving biodiversity	
This guidance was created for public authorities to emphasise the duty they have to conserving biodiversity as part of policy or decision making. The guidance states that public authorities should be able to how their duty to have regard for conserving biodiversity if they have identified ways to integrate biodiversity when they manage land, buildings, public spaces, water and community amenities etc.	The DP may influence areas where public authorities have a duty to conserve biodiversity. The SEA should include an objective to maintain or enhance biodiversity.
Defra and Welsh Government (2014), River Basin Planning Guidance	
Aims to give guidance on practical implementation of the Water Framework Directive (WFD). The river basin planning process involves setting environmental objectives for all groundwater and surface waters (including estuaries and coastal waters) within the river basin district, and devising programmes of measures to meet those objectives.	The Drought Plan should take into account the contents of this statutory guidance
Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report	
Five themes are identified that form the priorities for adaptation in the UK.	The SEA should take into account the need for climate change adaptation.
Defra (2012) National Policy Statement for Waste Water	
National Policy Statement (NPS) sets out Government policy for the provision of major waste water infrastructure. It will be used by the Infrastructure Planning Commission (IPC) to guide its decision making on development consent applications for waste water developments that fall within the definition of Nationally Significant Infrastructure Project (NSIP) as defined in the Planning Act 2008.	The SEA should seek to ensure the DP considers any unforeseen NSIP proposals that come forward prior to adoption which may affect water resources in the United Utilities area.
Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services	
The objective for the next decade is: 'to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with	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

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.	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	
Ecosystems services from natural capital contribute to the economic performance of the nation.	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

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Information and tools to enable decision makers to understand the wider value of ecosystems and their associated services.	'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) The Groundwater (England and Wales) 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	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,

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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 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	
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 and the Welsh Government‘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.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.	
This 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.	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.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.	
Environment Agency (2019) Environmental assessment for water company drought plans – supplementary guidance, Consultation draft	
This supplements the guidance provided on how to write and publish a drought plan. It provides technical guidance on how to develop an environmental assessment for supply side drought management actions 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 (2016), Drought Plan Direction 2016	
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	
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.
Department of Trade and Industry (2003), *Energy White Paper. Our Energy Future: Creating a Low Carbon Economy*	
The long-term the aim of the white paper is to cut the UK's carbon dioxide emissions by 60% by the year 2050. Key objectives include maintaining the reliability of energy supplies, promoting competitive markets to help sustainable economic growth and improved productivity and ensuring that every home is adequately and affordably heated.	The implementation of the DP may have an influence upon United Utilities' 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.
The Energy Act 2013	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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 United Utilities' 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 and Wales	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 (2020) Water Company Drought Plan guideline	
This guidance, written in conjunction with Defra, outlines the legislative requirements for a drought plan. This document also provides a timeline for the drought planning process.	The SEA should seek to comply with Governmental Guidance regarding the writing and application of Drought Plans.
Environment Agency (2013), *Managing Water Abstraction*	
This sets out how the EA manages water resources in England and Wales.	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	
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 ensure the DP contributes to the reduction in flood risk and coastal erosion
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:	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.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• climate change • population growth • diffuse pollution • water for wildlife and wetlands The strategy looks at resource management for Wales to 2050 and beyond.	
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 and Natural Resources Wales (2018), *Water Resources Planning Guideline: Interim update*	
Technical guidelines published jointly by the Welsh Government, NRW, Defra, Environment Agency and Ofwat for the 2019 Water Resource Management Plans for England and Wales.	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, *Shoreline Management Plans*	
A large-scale assessment of the risks associated with coastal processes with the aim to help reduce these risks to people and the developed, historic and natural environments. Coastal processes include tidal patterns, wave height, wave direction and the movement of beach and seabed materials. The second generation of Shoreline Management Plans (SMPs) are in production, covering the entire 6000 kilometres of coast in England and Wales. This generation of plans aim to incorporate sea level rise resulting from climate change and current defences with limited life and improvement requirements.	The SEA should seek to promote a reduction of the risks identified in the Shoreline Management Plans.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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.
Environment Agency Wales (now Natural Resources Wales), Salmon Action Plans	
The Environment Agency and Natural Resources Wales have prepared a series of action plans, based on river catchments, setting out what needs to be done to support and restore salmon populations. A total of 63 plans were being prepared for salmon rivers in England and Wales by 2002 as part of the Agency's National Salmon Management Strategy. The Plans identify and cost a series of actions designed to help safeguard and improve Salmon populations. A revised approach for the protection of wild salmon has been determined by Natural Resources Wales and an action plan is being developed.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity particularly those of Salmon identified in the Action Plans. The SEA will cover fish passage as an element of at least one sustainability objective.
Welsh Government (2016) Environment Act (Wales)	
Puts in place legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and joined-up way. This positions Wales as a low carbon, green economy, ready to adapt to the impacts of climate change. Key parts of the act include: • Sustainable management of natural resources. • Climate change - powers to put in place statutory emission reduction targets (including at least an 80% reduction in emissions by 2050) and carbon budgeting. • Improvements to waste management processes. • Fisheries, shellfish and marine licensing. • Clarifications regarding flood risk management and land drainage. Section 6 contains Biodiversity and resilience of ecosystems duty and states public authorities must seek to maintain and enhance biodiversity in the exercise of functions and promote the resilience of ecosystems.	The SEA should seek to ensure that this legislation is reflected in the SEA objectives particularly regarding biodiversity and the sustainable management of natural resources.
English Heritage, now known as Historic England (2016) Heritage at Risk	
Heritage at Risk is a national project that aims to identify the endangered sites (historic buildings and places with	The SEA should seek to protect and enhance heritage and landscape.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
increased risks of neglect and decay) and then help secure them for the future. Regional Heritage at Risk Registers were most recently published in 2017.	
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 (2015) Historic Environment Good Practice Advice in Planning Note 3	
This provides guidance on managing change within settings of heritage assets. This includes archaeological remains, historic buildings, sites, areas and landscapes.	The SEA should take into account effects on settings of heritage assets.
Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment	
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 (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 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

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
The six key areas for action are: • Using and managing land sustainably, which includes embedding an 'environmental net gain' principle for development (including housing and infrastructure) • Recovering nature and enhancing the beauty of landscapes • Connecting people with the environment to improve health and wellbeing • Increasing resource efficiency, and reducing pollution and waste • Securing clean, productive and biologically diverse seas and oceans • Protecting and improving the global environment	The 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.
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.
MHCLG (2018) National Planning Policy Framework 2018	
Presumption in favour of sustainable development. Core planning principles include taking account of the	The DP and SEA should take account of the key components of sustainable development

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
development needs of an area; contribute to conserving and enhancing the environment; re-use of previously developed land; conserve heritage assets; deliver sufficient community facilities to meet local needs. Delivering sustainable development includes: • Building a strong competitive economy; • Supporting a prosperous rural economy; • Promoting sustainable transport; Requiring good design; • Promoting healthy communities; Protecting green belt land; • Meeting the challenge of climate change, flooding and coastal change; • Conserving and enhancing the natural environment (including providing net gains for biodiversity); • Conserving and enhancing the historic environment; • Facilitating the sustainable use of minerals. Reservoirs are included within the definition of open space - of public value due to opportunities for sport and recreation and providing a visual amenity.	and seek to promote biodiversity net gain, Also, reservoirs contribute to recreation and visual amenity.
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 has a general purpose to ensure the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development. Section 40 places a duty to conserve biodiversity on public authorities which may include enhancing, restoring or protecting a population or habitat. This duty extends to the list of species and habitats published in Section 41 of the Act and also applies to Local Wildlife Sites.	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.
Natural Resources Wales, 2020, Salmon and sea trout plan of action for Wales	
This plan provides details of, the actions required to restore healthy and more sustainable populations of salmon and sea trout in Welsh rivers.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity. The impacts of the DP on populations of salmon and sea trout 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.	The Act Provides statutory requirements for maintaining fish passage. The SEA will cover fish passage as an element of at least one

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Proposals have been made to extend the legislation to apply to more fish species e.g. coarse fish, eel and lamprey species. These proposals are currently under review. The Act covers legislation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement. Proposed extensions to the legislation (under review) include the provision of fish passes and screening of water abstraction and discharge points for coarse fish, eel and lamprey species.	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 (England and Wales) Regulations 2009	
Implement European Council Regulations 1100/2007 establishing measures for the recovery of the stock of European eel. The Regulations will help implement delivery Eel Management Plans. They address eel records and re-stocking, close season and reduction of fishing effort, passage of eels and entrainment. The key objective is to ensure that at least 40% of the potential production of silver eels returns to the sea to spawn. This will be achieved by reducing exploitation of all life-stages of the eel and restoration of their habitats.	The SEA should seek to should seek to maintain or enhance the quality of habitats and biodiversity, and take regard of protected species identified. This should include migratory 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 (2009) UK Climate Projections UKCP09	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
The UKCP09 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 does take account of UKCP09 projections as its formulation through the WRMP process which takes account of climate change in its supply and demand projections. The SEA should also use UKCP09 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 (Water Framework Directive) (England and Wales) Regulations, 2017	
The Water Framework Directive (WFD) established a legal framework for managing the water environment across Europe. The requirements of this are set out in domestic law under these regulations. The overall aims are the sustainable use of water, preventing deterioration of water body status and the protection and improvement of inland surface waters, groundwater and transitional and coastal waters. River Basin Management Plans set out how these requirements will be delivered.	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) (England and Wales) Regulations 2009 SI3104	
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	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.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
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	
National Assembly for Wales (2015) *Well-being and Future Generations (Wales) Act 2015*	
This makes provision for sustainable development and a well-being duty on public bodies.	Well-being objectives need to be taken into account in the SEA.
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.
Welsh Government (2004) Technical Advice Note 15: Development and Flood Risk	
TAN 15 sets out a precautionary framework to guide planning decisions. The approach seeks to first, direct new development away from those areas which are at high risk of flooding and, second, where development has to be considered in high risk areas (Zone C), allow only those developments which can be justified to be located within such areas.	The DP should take account of flood risk management. The SEA should include a guide question relating to flood risk.
Welsh Government (2009) Technical Advice Note 5: Nature Conservation and Planning	
TAN 5 sets out how the planning system should contribute to protecting and enhancing biodiversity and geological conservation. It specifies that the planning system should: • Work to achieve nature conservation objectives through a partnership between local planning	The DP should seek to protect and enhance biodiversity and geodiversity.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
authroities, NRW, voluntary organisations, developers, landowners and other key stakeholders; • Integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time; • Ensure that the UK's international and national obligations for site, species and habitat protection are fully met in all planning decisions; • Look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally; • Help to ensure that development does not damage, or restrict access to, or the study of, geological sites and features or impede the evolution of natural processes and systems, especially on rivers and the coast; and. • Plan to accommodate and reduce the effects of climate change by encouraging development that will reduce damaging emissions and energy consumption and that help habitats and species to respond to climate change.	The SEA objectives should reflect the need to conserve, and where possible, enhance, biodiversity and geodiversity.
Welsh Government (2012) Energy Wales: A Low Carbon Transition	
Energy Wales sets out what the Welsh Government intend to do to achieve a low carbon economy whilst delivering economic benefits and jobs, ensure real community benefits and manage the interface with the natural environment.	The DP should seek to incorporate low carbon energy and energy efficiency. The SEA should include a guide question relating to climate change.
Welsh Government (2015) Water Strategy for Wales	
This Strategy is set within the context of our long-term policy direction to improve our natural resource management and covers a broad range of matters relating to the management of our water systems, including all inland waters, estuaries and coastal waters. Six key themes were identified for the strategy; 1. Water for nature, people and business 2. Improving the way we plan and manage our water services 3. Delivering excellent services to customers 4. Protecting and improving drinking water quality 5. 21st century swereage and drainage systems 6. Supporting delivery	The DP should have regard to the key themes of the Water Strategy for Wales. The SEA should include an objective relating to water resources.
Welsh Government (2016) The State of the Natural Resources Report (SoNaRR)	
This report sets out the state of Wales' natural resources. It assesses the extent to which natural resources in Wales are being sustainably managed, and recommends a proactive approach to building resilience, whilst also linking to the well-being of the people of Wales. The report identifies risks, threats and opportunities for integrates solutions that provide	The DP should take into account opportunities to address the risks and threats identified in the report. The SEA should have regard to risks, threats and opportunities identified in the report.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
multiple benefits, including; social, economic, environmental and cultural.	
Welsh Government (2017) Natural Resources Policy	
The Natural Resources Policy (NRP) is the second statuary product of the Environment 9Wales) Act. The NRP focuses on the sustainable management of Wales natural resources, to maximise their contribution to achieving goals set out in the Well-being of Future Generations Act. The three National Priorities included in the policy are: 1. Delivering nature-based solutions 2. Increasing renewable energy and resource efficiency 3. Taking a place-based approach.	The DP should take into account the National Priorities in the NRP. The SEA should include assessment criteria relating to protection and enhancement of the environment, ecology, soils, flooding and climate change.
Welsh Government (2018) Planning Policy Wales (2018) Edition 10	
Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. Its primary objective is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales. Chapter 6 Distinctive and Natural Places addresses water. Objectives of the planning system include: • To protect and improve water resources by promoting and encouraging increased efficiency and demand management of water as part of new developments, particularly in those areas where water resources may be under pressure or not available; • To ensure that the infrastructure on which communities and businesses depend is adequate to accommodate proposed development so as to minimise risk to human health and the environment and prevent pollution at source; • To ensure sustainable drainage systems are an integral part of design approaches for new development; and • To ensure the protection of the quantity and quality of surface and ground water supplies is taken into account as part of development proposals.	The SEA should take into account the objectives relating to water supply.
Welsh Government (2019) Draft National Development Framework (final emerging 2020)	
The National Development Framework (NDF) will help deliver sustainable places across Wales by 2040 and will replace the spatial plan. The NDF will cover big issues important to Wales' prosperity and well-being, such as the economy, housing, transport, energy and the environment. Outcomes of the NDF include a Wales where people live… • And work in connected, inclusive and healthy places • And work in towns and citites which are a focus and springboard for sustainable growth	The DP should have regard to the intended outcomes of the NDF. The SEA should take into account the outcomes of the NDF.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• In places that sustainable manage their natural resources and reduce pollution • In places with biodiverse, resilient and connected ecosystems • In places which are decarbonised. A draft was published and consulted on in 2019 and the final NDF will be published in 2020 and cover a 20 year period up to 2040.	
Welsh Government (2019) Draft National Flood and Coastal Erosion Risk Management Strategy for Wales	
This draft strategy sets out how the Welsh Government intend to manage risks from flooding and coastal erosion across Wales. It sets objectives and measures for all partners to work towards.	The DP should contribute to the reduction in flood risk and coastal erosion where possible. The SEA should include an objective/guide question relating to flooding.
Wildlife and Countryside Act, 1981	
The Act is the principle mechanism for providing legislative protection of wildlife in Great Britain. Species listed in Schedule 5 of the Act are protected from disturbance, injury, intentional destruction or sale. Other provisions outlaw certain methods of taking or killing listed species. This Act is brought up to date regularly to ensure the most endangered animals are on the schedule. The Act also improved protection for the most important wildlife habitats.	Some aspects of the DP may have effects on habitats and species in the United Utilities supply area and beyond. The SEA should seek to maintain or enhance the quality of habitats and biodiversity, and take regard of protected species and habitats.
Regional	
Canal & River Trust (2015) *North West Waterway Fisheries & Angling Action Plan*	
The action plan sets out several issues of importance to the local angling communities across the North West. Addressing these issues aims to improve the angling experience, fish stocks and the water environment. The actions are grouped under 10 themes, which include: • Develop & improve access to the fishery. • Fish passage and migration. • Predation & non native species • Fisheries and water quality and quantity.	The DP should seek to avoid harm to fisheries. The SEA assessment framework should include the protection or enhancement of factors affecting fisheries.
Environment Agency (undated), Managing Drought in the North West	
The document sets out the measures that the North West Region drought team will take to plan for and manage droughts. The drought plan's main aims are to: • Give a structured and flexible framework to deal with droughts of different type (for example, groundwater or surface-water) and severity; and	The supply of water resources in the region may be affected by future drought, therefore this plan is linked closely with the DP. The SEA should seek to address the causes of drought, and include objectives which seek to address the causes of drought, and where possible ensure that the symptoms of droughts are minimised.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• Set out a system of monitoring and reporting to identify and track the onset and progress of drought.	
Environment Agency (2012), Midlands Region Drought Plan	
This document sets out the measures that the Midlands Region drought team will take to plan for and manage droughts. It covers the Severn and Trent catchments from the Humber to the Severn Estuary including; Birmingham, Nottingham, Derby, Leicester, Stoke-on-Trent, Coventry, Shrewsbury, Stratford-on-Avon, Worcester and Gloucester. The drought plan's main aims are to: • Give a structured and flexible framework to deal with droughts of different type (for example, groundwater or surface-water) and severity; and • Set out a system of monitoring and reporting to identify and track the onset and progress of drought.	The supply of water resources in the region may be affected by future drought, therefore this plan is linked closely with the DP. The SEA should seek to address the causes of drought, and include objectives which seek to address the causes of drought, and where possible ensure that the symptoms of droughts are minimised.
Environment Agency (2015) Cumbria and Lancashire Drought Plan	
In 2015 the Environment Agency produced a drought plan for Cumbria and Lancashire. The report sets out: • The areas drought management structure; • The drought monitoring to be undertaken in the area; • The drought management options and the trigger for these actions; and • How the area deals with drought permits and drought order applications and site specific details.	The supply of water resources in the region may be affected by future drought, therefore this plan is linked closely with the DP. The SEA should seek to address the causes of drought, and include objectives which seek to address the causes of drought, and where possible ensure that the symptoms of droughts are minimised.
Environment Agency (2015) North West River Basin District River Basin Management Plan	
Provides a framework for protecting and enhancing the benefits provided by the water environment. It provides baseline classification of waterbodies, statutory objectives for protected areas and for water bodies and a programme of measures to achieve statutory objectives.	The DP will need to ensure that it is consistent with the principles of the River Basin Management Plan and that it does not adversely affect the issues identified as significant water management issues.
English Heritage, now known as Historic England, Heritage at Risk Register: North West (2018) West Midlands (2018)	
Historic England Corporate Plan 2015-2018 is reducing the risk to heritage assets. In order to achieve this aim we are working to: • Better understand the nature and extent of risk • Encourage others to save and re-use heritage at risk • Build the capacity of the sector to deliver solutions for heritage at risk • Provide advice and grants to help remove heritage from the register	It is unlikely the DP will have an effect on the Heritage at Risk Register.
Natural Resources Wales, Drought Plan	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Natural Resources Wales produces a drought plan which describes the indicators currently used to classify the different stages of drought.	The supply of water resources in the region may be affected by future drought, therefore this plan is linked closely with the DP. The SEA should seek to address the causes of drought, and include objectives which seek to address the causes of drought, and where possible ensure that the symptoms of droughts are minimised.
United Utilities Ltd (2019), *Final Water Resources Management Plan 2019-2045*	
See WRMP.	The DP will take into account the objectives of United Utilities' WRMP.
United Utilities Ltd (2020)., *Revised business plan for 2020-2025*	
The revised business plan sets various pledges United Utilities for the period 2020-2025. The commitments and targets relate to; provision of water, disposal of wastewater, value for money, customer service and environmental protection.	The DP should seek to support he Business Plan and the SEA framework should consider and echo the priorities set out in the Business Plan.
Water Company (various) Drought Plans adjacent to supply area	
This looks at the management of water resources to maintain service to customers during drought in the surrounding areas. The plans considered include; • Hafren Dyfrydwy Draft Drought Plan 2019 • Dwr Cymru Welsh Water Draft Drought Plan 2020 • Severn Trent Draft Drought Plan 2019-2024 • Yorkshire Water Draft Drought Plan 2019 • Northumbrian Water Final Drought Plan 2019	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.
Water Resources Management Plans from adjacent water companies	
These set out the plans to manage water resources by companies in adjacent areas, including: • Hafren Dyfrydwy Final Water Resources Management Plan 2019 • Hafren Dyfrydwy Final Water Resources Management Plan 2019 • Dwr Cymru Welsh Water Final Water Resources Management Plan 2019 • Severn Trent Final Water Resources Management Plan 2019 • Yorkshire Water Revised Draft Water Resources Management Plan 2019 • Northumbrian Water Final Water Resources Management Plan 2019	The DP should not conflict with the other water company operations especially drought options that may be operated simultaneously.
Sub-regional	
River Restoration and Water Level Management Plans	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Natural England and Environment Agency, Cumbria River Restoration Strategy	The DP may have an effect on River Restoration Plans for non-Natura 2000 sites. The SEA should include objectives that take into account the objectives of these sites where relevant.
AONB Management Units (various) *AONB Management Plans*	
The following AONBs are present in the United Utilities area: Anrnside and Silverdale; Forest of Bowland; North Pennines and the Solway Coast. The management plans for AONBs contain actions to ensure the protection and enhancement of the landscape.	The SEA should consider the effects of options on landscapes, including designated landscapes.
Defra (2010), *Eel Management Plans for the United Kingdom*: Dee River Basin District; Eel Management Plans for the United Kingdom: Northwest River Basin District	
These plans aim to achieve an escapement of silver eel to the spawning population that equals or exceeds a target set at 40 per cent of the potential biomass that would be produced under conditions with no anthropogenic disturbance due to fishing, water quality or barriers to migration. The aim of each Eel Management Plan is to describe the nature of the eel population and fishery in the RBD, to assess whether the stock is meeting its 40 per cent escapement target, and to present management actions that will ensure the long-term viability of the eel population.	The SEA should consider the potential impacts of the DP on eel populations and escapement targets.
Greater Manchester Combined Authority (2017), Our People Our Place: *Greater Manchester Strategy*	
The strategy identifies ten priorities for the future of the Manchester city-region to make it: • A place where all children are given the best start in life and young people grow up inspired to exceed expectations. • A place where people are proud to live, with a decent home, a fulfilling job, and stress-free journeys the norm. But if you need a helping hand you'll get it. • A place of ideas and invention, with a modern and productive economy that draws in investment, visitors and talent. • A place where people live healthy lives and older people are valued. • A place at the forefront of action on climate change with clean air and a flourishing natural environment. • A place where all voices are heard and where, working together, we can shape our future.	There could be some social, economic and environment effects associated with the implementation of the DP that may have effect with a particular focus upon a number of social, health and infrastructure related issues in the Manchester area.
Cumbria Strategic Partnership (2004), Sustainable Cumbria - A sub-regional strategy for Cumbria	
This Strategy sets out a sustainable approach to securing economic growth, social progress and environmental protection and enhancement in Cumbria over the next 20 years. Objectives:	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 Cumbria sub-region.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• Sustainable Cumbria will be a County that: • Celebrates its diversity, creativity and heritage; • Engages everyone in the mainstream of community life; • Retains and attracts the skilled and talented; • Participates to the full as a competitive sub-region; • Strengthens its infrastructure; • Makes a positive contribution to the wealth of the North West; and • Marries economic growth with social progress and environmental protection and enhancement. The strategy also includes 9 priority areas, 4 of these are town/area specific topics, the remaining 6 are: • Sustainable communities and well-being; • High quality tourism; • Strategic communications through improvements to the road, rail and air transport infrastructure; • Creating wealth and a diversified economy; • Rural regeneration; and • Addressing housing market failure and lack of affordable housing.	The SEA should seek to address the potential effects upon the local economy.
Environment Agency (2013) Abstraction Licensing Strategies (Catchment Abstraction Management Strategies (CAMS) process)	
This Licensing Strategies set out how the EA will manage the water resources of a catchment and contribute to implementing the WFD. It provides information about where water is available for further abstraction and an indication of how reliable a new abstraction licence may be. Strategies within the United Utilities area include: • Derwent and West Cumbria • Eden and Esk • South Cumbria • Lune and Wyre • Ribble, Douglas and Crossens • Lower Mersey and Alt • Northern Manchester • Upper Mersey • Weaver and Dane • Dee	The DP should consider the Strategy. The SEA framework should include objectives relating to sustainable water use.
Hadrian's Wall Partnership Board (2015), Hadrian's Wall Management Plan 2015-2019	
Objectives include: • Informed management of the world heritage site; • Maintaining boundaries of the world heritage site. • Protect the outstanding universal value (OUV) of the site using appropriate legislation, planning policy, guidance and management measures. • To maintain effective protection and management of the undesignated remains. • To pre-empt where possible direct and indirect threats to the OUV. • To manage the archaeological remains in the world heritage site. • To achieve a sustainable balance whereby the OUV can be conserved within current and future land use.	The SEA should ensure that there are no negative direct or indirect impacts, for example during construction, on the world heritage site.
Lake District National Park – State of the Park (2018): Reporting on the Partnership's Plan 2015-2020	

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
This report summarises the progress made by the Lake District National Park Partnership to deliver Vision for the National Park. The findings of this report will be used to develop the next Partnership Plan.	The DP should recognise the importance of effective management of water resources as an issue for natural landscapes. The DP may also have an effect on access to the national park and recreational opportunities for local communities and visitors. The SEA should seek to protect the landscapes and environment of the Lake District National Park.
Lake District National Park Authority (2006), *A Vision for 2030*	
This vision will guide the review of the National Park Management Plan and development policies and plans within the Local Development Framework. **Vision and objectives:** The Lake District National Park will be an inspirational example of sustainable development in action. A place where its prosperous economy, world class visitor experiences and vibrant communities come together to sustain the spectacular landscape, its wildlife and cultural heritage. Local people, visitors, and the many organisations working in the National Park or have a contribution to make to it, must be united in achieving this. The 4 key elements of the National Park plan are: **A Prosperous Economy** – Businesses will locate in the National Park because they value the quality of opportunity, environment and lifestyle it offers – many will draw on a strong connection to the landscape. Entrepreneurial spirit will be nurtured across all sectors and traditional industries maintained to ensure a diverse economy; **World Class Visitor Experiences** –High quality and unique experiences for visitors within a stunning and globally significant landscape. Experiences that compete with the best in the international market; **Vibrant Communities** –People successfully living, working and relaxing within upland, valley and lakeside places where distinctive local character is maintained and celebrate; and **A Spectacular Landscape** – A landscape which provides an irreplaceable source of inspiration, whose benefits to people and wildlife are valued and improved. A landscape whose natural and cultural resources are assets to be managed and used wisely for future generations.	The DP could help to ensure resources required to achieve the visions for local communities and economic development. The SEA should ensure that there are no negative impacts, for example during construction, on heritage sites.
Lake District National Park Authority (2008) Landscape Character Assessment and Guidelines	
The Assessment seeks to provide a framework for developing a shared understanding of the current character of the Lake District's landscapes and its future management needs. The specific aims and objectives for the two elements of the Assessment are: ***Character Assessment*** *Aims* • To improve the knowledge and understanding of the Lake District landscape to help conserve and enhance the overall characteristics, qualities and diversity of landscape character, its sense of place and local distinctiveness; • To identify and understand factors influencing landscape change; and • To provide baseline data to facilitate future monitoring. *Objectives*	The DP should recognise the importance of effective management of water resources as an issue for natural landscapes. The DP may also have an effect on access to the national park and recreational opportunities for local communities and visitors. The SEA should seek to protect the landscapes of the Lake District National Park; including the conservation and enhancement of the historic environment and the enrichment of biological diversity.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• To highlight and describe the character of the physical, cultural, historical, ecological, visual and sensory landscape; • To identify past, present and future forces for change and describe their impacts; and • To assess the sensitivity to and capacity for change, for each defined landscape character unit. ***Guidelines*** *Aims* • To support a holistic approach to managing change and encourage the sustainable planning and management of the Lake District landscape including the conservation and enhancement of the historic environment and the enrichment of biological diversity. *Objectives* • To provide planning, management and design guidelines, integrated with the Local Development Framework and the National Park Management Plan, for each landscape character type and area of distinctive character; and To suggest indicators for monitoring landscape change.	
Lake District National Park Authority (2010) Core Strategy	
This document sets out how the strategic vision for the National Park will be delivered by 2025. Other local plan documents include Allocations of Land and Minerals Safeguarding Areas.	The DP could help to ensure resources required to achieve the visions for local communities and economic development. The DP should recognise the importance of effective management of water resources as an issue for natural landscapes. The DP may also have an effect on access to the national park and recreational opportunities for local communities and visitors. The SEA should seek to protect the landscapes and environment of the Lake District National Park.
One West Lancs Partnership (formed 2013)	
One West Lancs is a new partnership which aims to improve the quality of life for everyone in West Lancashire. It was formed in April 2013 and is a partnership of local voluntary, public and business sectors. The key aims of One West Lancs are to: • To reduce health inequalities across West Lancashire • To improve educational attainment across West Lancashire • To develop and deliver an action plan for transport within and connecting West Lancashire • To promote energy efficiency, sustainable living and tackle fuel and food poverty • To promote excellent local services tailored to local priorities • To stand up for communities in West Lancs, listen to what they say and take appropriate action	There may be some economic effects associated with the implementation of the DP and the future management of water resources in the north west. The DP may also have some effects upon recreational and leisure opportunities. This may have an impact upon some of the strategic ambitions set out in the objectives of One West Lancs. The SEA should seek to address the potential effects upon the local economy.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
• To support and work towards the priorities of the West Lancs Sustainable Community Strategy which are: Safer, stronger communities, Improved health for all, Affordable housing, Sustainable development, Improved opportunities for young and older people, High quality accessible services, Improved economy and increased jobs and Better and protected environments.	
Local Biodiversity Action Plans (various)	
Local biodiversity action plan objectives include those associated with maintaining and safeguarding the current extent of protected designations and recognised habitats and achieving favourable status for these areas. The United Utilities assessment area covers many Local BAPs, including: • Cumbria; • Greater Manchetser; • Lancashire; • Cheshire; • North Merseyside; and, • Powys	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).
Local Planning Authority (various) Land Use Plans	
The United Utilities area covers a large number of Local Planning Authorities. Additionally, Local Development Plans prepared by local authorities in Wales may also be relevant to the DP and SEA. The main objectives of the existing and emerging Land Use Plans in these areas are related to the sustainable development of the area.	SEA should seek to ensure the DP options should be consistent with the Land Use Plans of those local authorities that will be affected by the option.
Local Geodiversity Action Plans (LGAPs)	
Local Geodiversity Action Plans (LGAPs) set out actions to conserve, enhance and promote the geodiversity of a particular area. They aim to identify, conserve and enhance the best sites that represent the geological history of an area. They also aim to promote geological sites, provide a local geodiversity audit and influence local planning policy. Currently, LGAPs exist or are in development for Cheshire Region, Cumbria, Greater Manchester, Lancashire, West Yorkshire, North Pennines AONB and Clwydian Range.	DP options should take into account the aims of the LGAPs. The SEA assessment should consider effects of options on geodiversity and outline enhancement and mitigation opportunities where these are identified.
Local Planning Authority (various) Local Plans/Local Development Plans	
The United Utilities assessment area includes a large number of Local Planning Authorities, identified as: - Cheshire East - Cheshire West and Chester; - Halton Borough Council; - Warrington Borough Council; - Allerdale Borough Council; - Copeland Borough Council; - Barrow In-Furness Borough Council; - Carlisle City Council; - Cumbria County council; - Eden District Council; - South Lakeland District Council;	The DP should take into account the Local Plans and emerging Local Plans. The SEA assessment framework should consider the effects of the DP on the achievement of the Plans' visions and the effects of options on sustainable land use.

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
- Bolton Metropolitan Borough Council; - Bury Metropolitan Borough Council; - Manchester City Council; - Oldham Metropolitan Borough Council; - Rochdale Metropolitan Borough Council; - Salford City Council; - Stockport Metropolitan Borough Council; - Tameside Metropolitan Borough Council; - Trafford Metropolitan Borough; - Wigan Metropolitan Borough Council; - Blackburn with Darwen Borough Council; - Blackpool Council; - Burnley Borough Council; - Chorley Borough Council; - Fylde Borough Council; - Hyndburn Borough Council; - Lancashire County Council; - Lancaster City Council; - Pendle Borough Council; - Preston City Council; - Ribble Valley Borough; - Rossendale Borough Council; - South Ribble Borough Council; - West Lancashire Borough Council; - Wyre Borough Council; - Knowsley Metropolitan Borough Council; - Liverpool City Council; - Sefton Council; - St. Helens Metropolitan Borough Council; - Wirral Metropolitan Borough Council; - Bradford District Council; - Calderdale Metropolitan Borough Council; - Craven District Council; - High Peak Borough Council; - Kirklees Metropolitan Borough Council; - Newcastle-under-Lyme Borough Council; - Richmondshire District Council; - Staffordshire Moorlands District Council; - Lake District National Park Authority;	
Local Wildlife Trust Strategies (various)	
There are a number of local Wildlife Trusts in the United Utilities area, including: • Cumbria Wildlife Trust • Lancashire Wildlife Trust • Cheshire Wildlife Trust • Derbyshire Wildlife Trust	The DP should take into account the key objectives of Wildlife Strategies and protect local wildlife. The SEA assessment framework should consider the effects of options on biodiversity.
Natural England National Character Area (NCA) Profiles	
There are over 30 NCAs within United Utilities' operating boundary. Each of these have individual objective relating to specific landscapes, habitats and species. Generalised objectives for each of these include: Conserve characteristic historic structures Protect the area's rich and diverse archaeology Protect the area's high levels of tranquillity	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
Protect, manage and enhance the good rights of way network Manage and enhance existing habitats Encourage the maintenance of traditional land management practices Protect, and encourage sympathetic management Protect and manage geological features Plan for climate change mitigation and adaptation	
Outline Water Cycle Studies (Various)	
Water cycle studies identify tensions between growth proposals, particularly housing development, and environmental requirements, and identify potential solutions to addressing them. Outline Water Cycle Studies have been prepared for Mid Mersey (Warrington Borough Council, Halton Borough Council and St. Helens Council), Cheshire West and Chester and Central Lancaster and Blackpool Councils have jointly prepared an Outline Water Cycle Study. The strategic objectives for Outline Water Cycle Studies are to: • Identify whether environmental resources can cope with further development, with particular reference to Water Framework Directive targets and UKCP09 climate change projections (i.e.can growth be accommodated without breaching water quality and abstraction limits); • Identify any potential impacts of development on the specially designated conservation sites and watercourses in the specified areas and other sites or features of significant nature conservation importance resulting from additional abstraction and wastewater discharge;	The DP should take into account any water cycle studies completed for identified growth areas (Mid Mersey, Cheshire West and Chester, Central Lancashire and Blackpool). The SEA assessment framework should include an objective relating to the efficient management of water.
Public Rights of Way Improvement Plans (ROWIPs)	
Objectives include those associated with each local authority's rights of way improvement plans.	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.
Peak District National Park Authority (2018), *Peak District National Park Management Plan 2018-2023*	
The National Park Management Plan provides the framework that encourages everyone to work together to achieve national park purposes. It is not a plan for an individual organisation or group but a plan for the place. It is, therefore, a partnership plan. It is the single most important strategic document for the Peak District National Park. It shares with everyone what the main issues and priorities are. It then sets out how, together, we are going to tackle those issues over the next five years. Compared with the previous management plan, fresh challenges have emerged through the nation's pending departure from the European Union alongside developing ideas in how we should manage protected landscapes. This has created a remarkable opportunity for us to shape the	Effective management of water resources is vital for continued economic, cultural and sustainable development. The DP should recognise the importance of climate change as an issue for the north west's natural landscapes. The DP may also have an effect upon on the theme of promoting a sustainable economy and thriving communities and access to the national park and recreational opportunities for local communities and visitor The SEA should seek to protect the landscapes of the national park; encourage continued development of the local economy

Objectives identified in the Policy, Plan or Programme	Influences on the DP and the SEA objectives
Peak District National Park in a fresh and innovative way whilst ensuring its special qualities are enhanced for the benefit of all.	and cultural heritage; and the protection of natural resources and biodiversity. The SEA should also include objectives relating to health and well-being, in particular how recreational opportunities may influence this and those relating to sustainable economy and thriving communities.
Snowdonia National Park Authority, Snowdonia National Park Management Plan 2010-2015	
Provides the strategic policy framework for the entire National Park and includes a specific Action Plan to be implemented.	The SEA should ensure that there are no negative impacts on the Snowdonia National Park.
Cheshire and Warrington Enterprise Partnership (2017) Cheshire and Warrington Matters, A Strategic and Economic Plan for Cheshire and Warrington	
This strategy, refreshed in July 2017, is intended to be a high level, strategic road map to achieving growth ambition. It includes the deployment of funding for additional homes and new job opportunities.	The implementation of the DP and the future availability of water resources may have an effect upon community cohesion, well being and continued prosperity within a sustainable environment. The SEA should seek to maintain and improve welfare and community infrastructure and maximise positive social impacts.
Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24	
The National Park Management Plan is the most important document for the Yorkshire Dales National Park. It is, in effect, a five year work programme for a whole range of organisations operating across the area. By 2040, it will be: • A distinctive, living, working, cultural landscape that tells the ongoing story of generations of people interacting with their environment. • A friendly, open and welcoming place with outstanding opportunities to enjoy its special qualities. • Home to the finest variety of wildlife in England. • Resilient and responsive to the impacts of climate change, storing more carbon each year than it produces. • Providing an outstanding range of benefits for the nation based on its natural resources, landscape and cultural heritage, which underpin a flourishing local economy. • Home to strong, self-reliant and balanced communities with good access to the services they need.	Effective management of water resources is vital for continued economic, cultural and sustainable development. The DP may also have an effect upon providing services for communities, access to the national park and recreational opportunities for local communities and visitors and the protection of biodiversity. The SEA should seek to protect the landscapes of the national park; encourage continued development of the local economy and cultural heritage; and the protection of natural resources and biodiversity. The SEA should also include objectives relating to providing access to services for communities and for health and well-being, in particular how recreational opportunities may influence this.

Appendix D: SEA Appraisal Tables

Drought Plan Option Name: Castle Carrock reservoir, dead water storage

Drought Plan Option Description: Temporary pumping to utilise dead storage (170.7 Ml volume). Will require installation of temporary pumping equipment and associated pipework.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over- abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** Minor construction work will be required to bring the source online as a drought option. There will be no loss of designated habitat due to the scheme as the construction footprint does not overlap any designated sites. Assuming best practice construction measures, impacts on nearby designated sites (including the North Pennine Moors SAC and River Eden SAC) will be negligible. Construction activities may result in disturbance to local habitats and species during the works. This disturbance is anticipated to be short term, temporary and reversible and is expected to be of negligible impact. Assuming best practice construction and mitigation methods are implemented, the potential impacts of construction, including on the potential spread of invasive species, are considered to be negligible. **Operation** The drought option involves abstraction of deadwater from Castle Carrock Reservoir only (which is not part of any area designated for nature conservation) and is not dependent on abstraction from the River Eden i.e., the reservoir can be drawn down even if there is no abstraction from the river. As such, there are no impacts on the designated features of the River Eden SAC. There may be fish resident in the reservoir, and there may be impacts on this population dependent on the extent of drawdown. It is assumed any impacts on fish populations will be mitigated e.g., through fish rescues. This impact has been assessed as minor adverse.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Medium	High	Long-term	Temporary	Low	Low	**Construction** Assuming best practice construction and mitigation methods are implemented, the potential impacts of construction on the potential spread of invasive species are considered to be negligible.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	High	Long-term	Temporary	Low	Medium	**Construction** Construction impacts are likely to be of a short-term and temporary nature. As they will be limited in scale, the impacts on the local community will be short-term, reversible and minor. It is assumed that public rights of way will be maintained during the construction phase. During the construction phase, there will be no impact on security of supplies or quality of drinking water. **Operation** Implementation of this drought option would enable the continued supply of water if dry weather continues. Without implementation of this drought option in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as minor beneficial, based on moderate beneficial impacts due to continued supply of drinking water and minor adverse impacts on recreation (angling).	Negligible adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Short-term	Temporary	Low	Medium	**Construction** Construction impacts are likely to be of a short-term and temporary nature. Given that construction activities will take place within an existing site, negligible impacts are anticipated. **Operation** As a result of the reservoir drawdown, there may be some minor adverse impacts on recreation due to potential impacts on fish populations and resulting impacts on angling.	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	Moderate	Long-term	Temporary	Low	Medium	**Construction** Construction impacts are likely to be of a short-term and temporary nature. As they will be limited in scale, the impacts on the local community will be short-term, reversible and minor. During the construction phase, there will be no impact on security of supplies or quality of drinking water. **Operation** Implementation of this drought option would enable the continued supply of water if dry weather continues. Without implementation of this drought option in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as minor beneficial based on continued supply of drinking water.	Negligible adverse	Minor beneficial
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.	Small	Moderate	Short-term	Permanent	Low	Low	**Construction** Construction requirements for the modifications to the filter plant and installation of the temporary pumping station include a concrete base for pre-fabricated filtration plant and M&E building (~3mx4m) and access track. Installation of an acid rig and pump-sets/M&E including tapping into existing pipework. A small volume of materials will be required, including 60t of hardcore and 20m^3 of concrete. It is assumed that pumps and any materials required would be sourced locally to minimise transportation and greenhouse gas emissions. On decommissioning, it has been assumed that materials will be recycled appropriately. **Operation** Small changes to energy use are envisaged due to increased pumping of water from the reservoir. Overall, the impacts on material assets and resource use have been assessed as negligible.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Permanent	Low	Low	**Operation** Minor changes to energy use are envisaged due to increased pumping of water from the reservoir. Overall, the impacts on material assets and resource use have been assessed as negligible	Negligible adverse	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** Temporary submersible pumps would be required to pump the dead storage. The impact of installation of the pumps may be temporary localised minor impacts towards flows in the reservoir, which are anticipated to be negligible. **Operation** Abstraction of dead storage would result in increased drawdown of the reservoir by an estimated additional 6m below the normal operational drawdown limit. However, it is noted that the reservoir is a storage reservoir and not a natural water body, and overall, this impact has been assessed as minor adverse, temporary and reversible.	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** Temporary submersible pumps would be required to pump the dead storage. The impact of installation of the pumps may be temporary localised minor impacts in water quality in the reservoir, which are anticipated to be negligible. **Operation** Abstraction of dead storage would result in increased drawdown of the reservoir by an estimated additional 6m below the normal operational drawdown limit. However, it is noted that the reservoir is a storage reservoir and not a natural water body, and overall, this impact has been assessed as minor adverse, temporary and reversible.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** Temporary submersible pumps would be required to pump the dead storage. The impact of installation of the pumps may be temporary localised minor impacts in water quality in the reservoir, which are anticipated to be negligible. **Operation** Abstraction of dead storage would result in increased drawdown of the reservoir by an estimated additional 6m below the normal operational drawdown limit. However, it is noted that the reservoir is a storage reservoir and not a natural water body. Overall, impacts are assessed as minor adverse, temporary and reversible and no risk to WFD status is anticipated.	Minor adverse	Negligible beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There would be no major land use changes associated with this option, and works are within the existing UU site. Installation of the pumps in the reservoir may result in small localised reversible changes to geomorphology (due to any disturbance of bed material). This impact has been assessed as negligible. **Operation** Reservoir drawdown and exposure of shoreline margins may result in minor adverse, temporary and reversible geomorphological impacts. Overall, the impacts on soil, geology and land use are summarised as minor adverse.	Minor adverse	Negligible beneficial
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There would be no major land use changes associated with this option, and works are within the existing UU site. Installation of the pumps in the reservoir may result in small localised reversible changes to geomorphology (due to any disturbance of bed material). The small footprint provides limited opportunity for enhancement. The overall impact has been assessed as negligible. **Operation** No impacts on ecosystem functions of land, soil or geology are anticipated during operation.	Negligible adverse	Negligible beneficial
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Small	Moderate	Short-term	Temporary	Low	Low	**Construction** The installation of the pumps will require delivery of plant and materials to site. It is assumed that pumps and materials will be sourced locally to minimise transport requirements. Transport requirements would include a total of 8 HGV trips per day for 2 weeks and 4 HGV trips per day for 4 weeks and a further 25 HGV trips for delivery of the sub-base, generator, building, rig and pump. This impact has been assessed as negligible. **Operation** No operational impacts on air quality are anticipated.	Negligible adverse	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	Moderate	Long-term	Temporary	Low	Low	**Construction** The installation of the pumps will require delivery of plant and materials to site, resulting in a small increase in CO_2 emissions. **Operation** Minor changes to energy use and therefore CO_2 emissions are envisaged due to pumping of water from the reservoir. This impact has been assessed as negligible.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** The installation of the pumps will require delivery of plant and materials to site, resulting in a small increase in CO_2 emissions. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Small	Moderate	Short-term	Temporary	Low	Low	**Construction** The construction phase is restricted to the area within the existing site, and as such, it is not anticipated that any sites of archaeological or cultural heritage importance will be affected. Construction impacts on archaeology and cultural heritage are anticipated to be negligible. **Operation** Additional drawdown of the reservoir is not anticipated to impact any sites of archaeological or cultural heritage importance, or palaeo-environmental remains. In summary, impacts on archaeology and cultural heritage are anticipated to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Large	Moderate	Short-term	Temporary	Low	High	**Construction** There may be a slight impact to landscape and visual amenity during installation of the temporary pumps, due to plant and vehicles on site. This impact is temporary and reversible and has been assessed as minor adverse (as the site is within the North Pennines AONB). **Operation** Temporary minor adverse effects on landscape and visual amenity are anticipated due to changes in exposure of the reservoir shoreline. The new buildings are relatively small in size and within the existing site area. In view of the fact that the reservoir levels are likely to be at their lowest during peak tourist season and the site is within the North Pennines AONB, the impact of the drought option on landscape and visual amenity is considered to be moderate adverse but temporary.	Moderate adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Large	Moderate	Short-term	Temporary	Low	High	**Construction** No significant inter-relationships have been identified during the construction phase. **Operation** Key inter-relationships between topics include reservoir level impacts on biodiversity, flora and fauna, soil, geology and land use and landscape and visual amenity. Overall, these have been summarised as moderate adverse.	Moderate adverse	Negligible beneficial

Drought Plan Option Name: E2.1 Drought Publicity

Drought Plan Option Description: On reaching Level 1 UU would enhance their water conservation/efficiency publicity programme to customers. At each subsequent level the communications to customers would reflect the actions associated with that trigger (e.g. at Level 1, a campaign for voluntary water use restraint may commence using our Agile communications approach). Concurrent actions could include rezoning of water supplies. A combination of increased publicity and a campaign for voluntary water use restraint could result in a saving of 2% of the average dry weather demand expected during a drought period. During the winter, publicity will focus on providing advice to customers to use water wisely inside the home and to lag their pipes to prevent bursts in freezing temperatures. Whereas in the spring/summer, publicity would concentrate on the use of water for garden watering etc.

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Large	Moderate	Long-term	Temporary	Low	Low	Drought publicity is assumed to be communicated through radio, internet/social media and newspaper advertisements. Such methods of publicity are considered to have no impact on biodiversity, flora or fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow sensitive habitats/species). Overall, the impact of this option on biodiversity has been summarised as negligible.	None	Negligible beneficial
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Long-term	Temporary	Low	Medium	Drought publicity will result in water savings, which will contribute towards improving the security of supply of water in UU's supply region. There is potential for the media/water efficiency campaign to raise awareness of the importance and value of water environment for health and well-being.	None	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Long-term	Temporary	Low	Medium	Drought publicity will result in water savings, which will contribute towards improving the security of supply of water in UU's supply region. The impact of this option has been summarised as minor beneficial and temporary, taking into account the potential for reduced water consumption.	None	Minor beneficial
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.	Large	Moderate	Long-term	Temporary	Low	Medium	Drought publicity will not involve any increased material resource use. Drought publicity will result in increased awareness of the public of water resource consumption and waste (water). This option will reduce the amount of water used in the region. Impacts have been summarised as minor beneficial and temporary.	None	Minor beneficial
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.	Large	Moderate	Long-term	Temporary	Low	Medium	Drought publicity will result in increased awareness of the public of water resource consumption and waste (water). This option will reduce the amount of water used in the region. Impacts have been summarised as minor beneficial and temporary.	None	Minor beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Large	Moderate	Long-term	Temporary	Low	Medium	Drought publicity is assumed to be communicated through radio, internet/social media and newspaper advertisements. Such methods of publicity are considered to have beneficial impact on water, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source. Overall, the impact of this option on water has been summarised as minor beneficial.	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Large	Moderate	Long-term	Temporary	Low	Medium	Drought publicity is assumed to be communicated through radio and newspaper advertisements. Such methods of publicity are considered to have beneficial impact on water, acknowledging that reduced consumer demand for water (2% of the average dry weather demand expected during a drought period) will result in reduced requirement for abstraction at source. Overall, the impact of this option on water has been summarised as minor beneficial.	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	Large	Moderate	Long-term	Temporary	Low	Medium	The drought publicity is considered to have beneficial impact on water via reduced consumer demand for water. This may have long term impacts on consumer behaviour and water usage through information provision and providing information to the public regrading water efficiency methods.	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	Drought publicity is assumed to be communicated through radio, internet/social media and newspaper advertisements and as such will not involve any increased resource use, or increased CO_2 emissions. No impacts of drought publicity on air and climate are anticipated.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Large	Moderate	Short-term	Temporary	Low	Low	Demand measures are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Large	Moderate	Long-term	Temporary	Low	Low	Drought publicity is considered to have no impact on landscape and visual amenity, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related landscape or visual impacts. This option is not anticipated to have any implications for access to the countryside. Overall, the impacts have been assessed as negligible.	None	Negligible beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Large	Moderate	Long-term	Temporary	Low	Medium	Reduction in water use (Material Assets and Resource Use) has the potential to positively affect other topics including Biodiversity, Flora and Fauna, Water, and Landscape and Visual Amenity due to reduced requirement for abstraction at source. This impact has been summarised as minor beneficial.	None	Minor beneficial

Drought Plan Option Name: Increased leakage detection and repair activity

Drought Plan Option Description: Increased leakage detection and repair activity: Savings made through enhanced leakage detection and repair will vary across the region and will depend upon the situation in other regions of the country, the location and severity of the drought, the timescale for implementation of the action etc. Potential saving of up to 8.9 Ml/d, however enhanced leakage detection and repair may not result in a reduction in leakage levels, but rather reduce the increase that would otherwise have occurred.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over- abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Large	Moderate	Short-term	Temporary	Low	Low	Construction activities associated with leakage detection and repair activities may result in disturbance to local habitats and species during the works. This disturbance is, however, anticipated to be short term, temporary and reversible and, overall, is expected to be negligible. It is acknowledged that reduction in water lost through leakage will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow sensitive habitats/species). Impacts on biodiversity have been summarised as negligible.	Negligible adverse	Negligible beneficial
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Short-term	Temporary	Low	Medium	Leakage detection and repairs will provide water savings of up to 8.9Ml/d which will contribute towards improving the security of supply of water in the UU's supply region. Drinking water quality will not be affected by the leakage detection and repair. As such, this option will have a minor beneficial impact due to the security of supply of drinking water. 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.	Negligible adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Large	Moderate	N/A	N/A	N/A	N/A	It is assumed that public rights of way will be maintained during repair activities and there will be no impacts upon recreational opportunity.	None	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Short-term	Temporary	Low	Medium	Leakage detection and repairs will provide water savings of up to 8.9Ml/d which will contribute towards improving the security of supply of water in the UU's supply region. As such, this option will have a minor beneficial impact due to the security of supply of drinking water.	None	Minor beneficial
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.	Large	Moderate	Short-term	Temporary	Low	Medium	Leakage detection and repairs will result in the reduction of water lost in the supply network (of up to 8.9Ml/d). There will be vehicle movements associated with these activities. Repairs may require raw materials, and it has been assumed that any materials required would be obtained locally, and any waste materials recycled appropriately.	Negligible adverse	None
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.	Large	Moderate	Short-term	Temporary	Low	Medium	Leakage detection and repairs will result in the reduction of water lost in the supply network (of up to 8.9Ml/d). The impact of this option has been summarised as minor beneficial, taking into account reductions in water lost.	None	Minor beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Large	Moderate	Short-term	Temporary	Low	Medium	This option will not directly result in or modify any abstraction (surface water or groundwater). Reduction in water lost through leakage will result in reduced requirement for abstraction at source. Overall, the impacts have been assessed as minor beneficial.	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts on surface water or groundwater quality are anticipated.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Large	Moderate	Short-term	Temporary	Low	Medium	Reduction in water lost through leakage will result in reduced requirement for abstraction at source. Overall, the impacts have been assessed as minor beneficial.	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	Large	Moderate	Short-term	Temporary	Low	Medium	The option will improve the efficiency of the water supply network.	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Large	Moderate	Short-term	Temporary	Low	Low	Construction activities associated with leakage detection and repair activities may result in localised disturbance to soils and geology during the works. As leakage detection and repair activity will be on pipelines which are already in situ, this disturbance is anticipated to be short term, temporary and reversible and overall impacts are expected to be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Large	Moderate	Short-term	Temporary	Low	Low	As leakage detection and repair activity will be on pipelines which are already in situ, this disturbance is anticipated to be short term, temporary and reversible and overall impacts are expected to be negligible.	Negligible adverse	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Large	Moderate	Short-term	Temporary	Low	Low	Excavation works and repair activity will require the use of plant and vehicles, which will result in temporary increase in CO_2 emissions in the short term, associated with construction activities. 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 CO_2 emissions associated with decreased need for water treatment and pumping). Given these long term benefits, the impacts on air and climate are anticipated to be negligible.	Negligible adverse	Negligible beneficial
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	Moderate	Long-term	Permanent	Low	Low	Excavation works and repair activity will require the use of plant and vehicles, which will result in temporary increase in CO_2 emissions in the short term, associated with construction activities. 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 CO_2 emissions associated with decreased need for water treatment and pumping). Given these long term benefits, the impacts on air and climate are anticipated to be negligible.	Negligible adverse	Negligible beneficial
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Large	Moderate	Short-term	Temporary	Low	Low	Demand measures are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Large	Moderate	Short-term	Temporary	Low	Low	Leakage detection and repair activity 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. Impacts on archaeology and cultural heritage are anticipated to be negligible.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Large	Moderate	Short-term	Temporary	Low	Low	Although there will be some temporary, short term impacts of leakage detection and repair activity upon localised landscapes, the effect of the leakage detection and repair is not anticipated to have any long term impacts upon landscape, as the works will be on pipelines which are already in situ. It is acknowledged that reduced consumer demand for water will result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related landscape or visual impacts. Impacts on landscape and visual amenity are anticipated to be negligible.	Negligible adverse	Negligible beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Large	Moderate	Long-term	Permanent	Low	Medium	Reduction in water lost (Material Assets and Resource Use) has the potential to positively affect other topics including Biodiversity, Flora and Fauna, Water, and Landscape and Visual Amenity due to reduced requirement for abstraction at source. This impact has been summarised as minor beneficial.	Negligible adverse	Minor beneficial

Drought Plan Option Name: Campaign for voluntary water use restraint

Drought Plan Option Description: In order to encourage a reduction in customer demand for water, UU will commence a campaign for voluntary water use restraint at drought level 1. The message will be conveyed through the use of press releases and coverage on our website and social media channels. The saving associated with a campaign for voluntary water use restraint has been estimated to be 3-5%
of the average dry weather demand expected during the drought period.

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Large	Moderate	Long-term	Temporary	Low	Low	Campaign for voluntary water use restraint is assumed to be communicated through the use of press releases and coverage on the UU website and social media channels. Such methods of publicity are considered to have no impact on biodiversity, flora or fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow sensitive habitats/species). Overall, the impact of this option on biodiversity has been summarised as negligible.	None	Negligible beneficial
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Long-term	Temporary	Low	Medium	The saving associated with a campaign for voluntary water use restraint has been estimated to be 3-5% of the average dry weather demand expected during the drought period, which will contribute towards improving the security of supply of water in UU's supply region. There is potential for the media/water efficiency campaign to raise awareness of the importance and value of water environment for health and well-being.	None	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	N/A	N/A	N/A	N/A			No impacts on recreation are anticipated.	None	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Long-term	Temporary	Low	Medium	The saving associated with a campaign for voluntary water use restraint has been estimated to be 3-5% of the average dry weather demand expected during the drought period, which will contribute towards improving the security of supply of water for businesses in UU's supply region.	None	Minor beneficial
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.	Large	Moderate	Long-term	Temporary	Low	Medium	Campaign for voluntary water use restraint is assumed to be communicated through the use of press releases and coverage on our website and social media channels and as such will not involve any increased material resource use. The option will result in increased awareness of the public of water resource consumption and waste (water). This option will reduce the amount of water used in the region, 3-5% of the average dry weather demand per year. Impacts have been summarised as minor beneficial and temporary.	None	Minor beneficial
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.	Large	Moderate	Long-term	Temporary	Low	Medium	Campaign for voluntary water use restraint will result in increased awareness of the public of water resource consumption and waste (water). This option will reduce the amount of water used in the region, 3-5% of the average dry weather demand per year. Impacts have been summarised as minor beneficial and temporary.	None	Minor beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Large	Moderate	Long-term	Temporary	Low	Medium	Campaign for voluntary water use restraint is assumed to be communicated through the use of press releases and coverage on our website and social media channels. Such methods of publicity are considered to have beneficial impact on water, acknowledging that reduced consumer demand for water (3-5%) will result in reduced requirement for abstraction at source. Overall, the impact of this option on water has been summarised as minor beneficial.	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	N/A	N/A	N/A	N/A			No impacts on surface and groundwater quality of waterbodies are anticipated.	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Large	Moderate	Long-term	Temporary	Low	Medium	Campaign for voluntary water use restraint is assumed to be communicated through the use of press releases and coverage on our website and social media channels. Such methods of publicity are considered to have beneficial impact on water, acknowledging that reduced consumer demand for water (3-5% of the average dry weather demand expected during a drought period) will result in reduced requirement for abstraction at source. Overall, the impact of this option on water has been summarised as minor beneficial.	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	Large	Moderate	Long-term	Temporary	Low	Medium	The drought publicity is considered to have beneficial impact on water via reduced consumer demand for water. This may have long term impacts on consumer behaviour and water usage through information provision and providing information to the public regrading water efficiency methods.	None	Minor beneficial

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	Campaign for voluntary water use restraint is assumed to be communicated through the use of press releases and coverage on our website and social media channels and as such will not involve any increased resource use, or increased CO2 emissions. No impacts of the drought option on air and climate are anticipated.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of the drought option on air and climate are anticipated.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Large	Moderate	Short-term	Temporary	Low	Low	Demand measures are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of drought publicity on any archaeological or historic sites are anticipated.	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Large	Moderate	Long-term	Temporary	Low	Low	Campaign for voluntary water use restraint is considered to have no impact on landscape and visual amenity, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related landscape or visual impacts. This option is not anticipated to have any implications for access to the countryside. Overall, the impacts have been assessed as negligible.	None	Negligible beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Large	Moderate	Long-term	Temporary	Low	Medium	Reduction in water use (Material Assets and Resource Use) has the potential to positively affect other topics including Biodiversity, Flora and Fauna, Water, and Landscape and Visual Amenity due to reduced requirement for abstraction at source. This impact has been summarised as minor beneficial.	None	Minor beneficial

Drought Plan Option Name: Water use restriction

Drought Plan Option Description: This drought option is comprised of voluntary water use restrictions (applying to the general use of a hosepipe for domestic purposes) and statutory water use restrictions. The saving associated with water use restrictions has been estimated to be 3-5% of the average dry weather demand expected during the drought period.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over- abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Large	Moderate	Long-term	Temporary	Low	Low	The temporary use ban is considered to have no impact on biodiversity, flora or fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow sensitive habitats/species). Overall, the impact of this option on biodiversity has been summarised as negligible.	None	Negligible beneficial
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Long-term	Temporary	Low	Medium	The temporary use ban will provide water savings which will contribute towards improving the security of supply of water in the UU's supply region. Drinking water quality will not be affected by the restrictions. This option has been summarised as having minor beneficial impacts on population and human health taking into account beneficial impacts of security of supply of drinking water, and as having potential minor adverse effects to informal recreation.	Minor adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Large	Moderate	Long-term	Temporary	Low	Medium	There may be potential for minor impacts upon recreational opportunity due to restriction on filling of domestic swimming or paddling pools and water use in gardens and allotments etc.	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Long-term	Temporary	Low	Medium	The impact of the drought option would be restricted to domestic customers. It is assumed the temporary use ban would include an exemption for relevant businesses e.g. car wash/window cleaners. Vulnerable members of the population would also be exempted from the measures imposed under the temporary use ban. There may be some impact on the horticultural business sector in general, as plant buying patterns have the potential to change during the imposition of a temporary use ban, however this may also result in long term behaviour changes towards the use of more sustainable/water efficient planting.	Minor adverse	None
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.	Large	Moderate	Long-term	Temporary	Low	Medium	A hose-pipe ban 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.	None	Minor beneficial
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.	Large	Moderate	Long-term	Temporary	Low	Medium	Water use restrictions will reduce the demand for water in the region, improving the efficiency of existing resource use. Impacts have been summarised as minor beneficial and temporary (i.e., while the restrictions are in place).	Negligible adverse	Minor beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Large	Moderate	Long-term	Temporary	Low	Medium	This option will not directly result in or modify any abstraction (surface water or groundwater). Reduction in demand for water will result in reduced requirement for abstraction at source. Overall, the impacts have been assessed as minor beneficial.	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Large	Moderate	Long-term	Temporary	Low	Medium	This option will not directly result in or modify any abstraction (surface water or groundwater). Reduction in demand for water will result in reduced requirement for abstraction at source. Overall, the impacts have been assessed as minor beneficial.	None	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	Large	Moderate	Long-term	Temporary	Low	Medium	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.	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on soil, geology and land use are anticipated.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on soil, geology and land use are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on soil, geology and land use are anticipated.	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on air and climate are anticipated.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on air and climate are anticipated.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Large	Moderate	Short-term	Temporary	Low	Low	Demand measures are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on any archaeological or historic sites are anticipated.	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Large	Moderate	Long-term	Temporary	Low	Low	Demand restrictions are considered to have no impact on landscape and visual amenity, other than to acknowledge that reduced demand for water will result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related landscape or visual impacts. This option is not anticipated to have any implications for access to the countryside. Overall, the impacts have been assessed as negligible.	None	Negligible beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Large	Moderate	Long-term	Temporary	Low	Medium	Reduction in water use (Material Assets and Resource Use) has the potential to positively affect other topics including Biodiversity, Flora and Fauna, Water, and Landscape and Visual Amenity due to reduced requirement for abstraction at source. This impact has been summarised as minor beneficial.	None	Minor beneficial

Drought Plan Option Name: Ordinary Drought Order (Non-Essential Use Ban)

Drought Plan Option Description: Drought order to ban non-essential uses of water

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Large	Moderate	Long-term	Temporary	Low	Low	An Ordinary Drought Order is considered to have no impact on biodiversity, flora or fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow sensitive habitats/species). Overall, the impact of this option on biodiversity has been summarised as negligible.	None	Negligible beneficial
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Long-term	Temporary	Low	Low	An Ordinary Drought Order will provide water savings which will contribute towards improving the security of supply of water in the UU's supply region. Drinking water quality will not be affected by the restrictions. This option has been summarised as beneficial impacts on population and human health due to impacts of security of supply of drinking water, and potential minor adverse effects to recreation and socio-economics.	Minor adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Large	Moderate	Long-term	Temporary	Low	Medium	There may be potential for moderate impacts upon recreational opportunity due to any restrictions on filling of non-domestic swimming pools and on water use in commercial premises, gardens and allotments etc.	Moderate adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Long-term	Temporary	Low	Medium	The option carries the risk of economic impact on businesses that benefit directly or indirectly from water usage (e.g. window cleaning businesses, car washes, sports and leisure facilities including swimming pools, garden and landscape orientated businesses.	Moderate adverse	None
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.	Large	Moderate	Long-term	Temporary	Low	Medium	An Ordinary Drought Order will reduce the demand for water in the region. It will not result in any increase in the generation of waste.	None	Moderate beneficial
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.	Large	Moderate	Long-term	Temporary	Low	Medium	An Ordinary Drought Order will reduce the demand for water in the region. Impacts have been summarised as minor beneficial and temporary (i.e., while the restrictions are in place).	None	Moderate beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Large	Moderate	Long-term	Temporary	Low	Medium	This option will not directly result in or modify any abstraction (surface water or groundwater). Reduction in demand for water will result in reduced requirement for abstraction at source. Overall impacts have been assessed as minor beneficial.	None	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts on surface water or groundwater quality are anticipated.	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Large	Moderate	Long-term	Temporary	Low	Medium	This option will not directly result in or modify any abstraction (surface water or groundwater). Reduction in demand for water will result in reduced requirement for abstraction at source. Overall impacts have been assessed as minor beneficial.	Negligible adverse	Minor beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	Large	Moderate	Long-term	Temporary	Low	Medium	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.	None	Minor beneficial
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on soil, geology and land use are anticipated.	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on soil, geology and land use are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on soil, geology and land use are anticipated.	None	None

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on air and climate are anticipated.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on air and climate are anticipated.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Medium	High	Long-term	Temporary	Low	High	Demand measures are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Moderate beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of demand restrictions on any archaeological or historic sites are anticipated.	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Large	Moderate	Long-term	Temporary	Low	Low	An Ordinary Drought Order is considered to have no impact on landscape and visual amenity, other than to acknowledge that reduced demand for water will result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related landscape or visual impacts. This option is not anticipated to have any implications for access to the countryside.	Negligible adverse	Negligible beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Large	Moderate	Long-term	Temporary	Low	Medium	Reduction in water use (Material Assets and Resource Use) has the potential to positively affect other topics including Biodiversity, Flora and Fauna, Water, and Landscape and Visual Amenity due to reduced requirement for abstraction at source. This impact has been summarised as minor beneficial.	Negligible adverse	Minor beneficial

Drought Plan Option Name: E2.5 Pressure Management

Drought Plan Option Description: At drought levels 1, 2 and 3 UU would consider reducing the pressure in certain parts of the water network, to help reduce demand. It is anticipated pressure reduction at level 1 will give up savings of up to 4.8 Ml/d, level 2 up to 12.6 Ml/d and Level 3 up to 35.15 Ml/d. This corresponds to increased targeting of pressure reduction as a drought progresses.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over- abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Large	Moderate	Short-term	Temporary	Low	Low	There are no construction activities associated with this drought option. Reducing the pressure in certain parts of the water network, to help reduce demand is considered to have no impact on biodiversity, flora or fauna, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source (and therefore, potential for positive impacts on flow sensitive habitats/species). Overall, the impact of this option on biodiversity has been summarised as negligible.	None	Negligible beneficial
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Short-term	Temporary	High	Medium	Pressure management will result in annual water savings for level 1 of up to 4.8 Ml/d, level 2 up to 12.6 Ml/d and Level 3 up to 35.15 Ml/d Ml/d per year, which will contribute towards improving the security of supply of water in UU's supply region. The impact of this option has been summarised as moderate beneficial and temporary, taking into account the potential for reduced water consumption. Reduced pressure may have adverse impacts on water dependent recreational activities due to delays e.g. filling swimming pools and ponds, however these are assessed as negligible.	Negligible adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	N/A	N/A	N/A	N/A	N/A	N/A	No impacts on recreation are anticipated.	None	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Short-term	Temporary	High	Medium	Pressure management will result in annual water savings for level 1 of up to 4.8 Ml/d, level 2 up to 12.6 Ml/d and Level 3 up to 35.15 Ml/d Ml/d per year, which will contribute towards improving the security of supply of water in UU's supply region. The impact of this option has been summarised as moderate beneficial and temporary, taking into account the potential for reduced water consumption. Reduced pressure may have adverse impacts on water dependent businesses due to delays in providing services which rely on specific volumes or pressure of water e.g. non-domestic swimming pools, car/window washing businesses.	Minor adverse	Moderate beneficial
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.	Large	Moderate	Short-term	Temporary	High	Medium	Reducing the pressure in certain parts of the water network, to help reduce demand will not involve any increased material resource use. This option will result in annual water savings for level 1 of up to 4.8 Ml/d, level 2 up to 12.6 Ml/d and Level 3 up to 35.15 Ml/d Ml/d per year. The impact of this option has been summarised as moderate beneficial and temporary, taking into account the potential for reduced water consumption.	None	Moderate beneficial
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.	Large	Moderate	Short-term	Temporary	High	Medium	Through concentrating on areas that would provide the biggest demand saving benefits and where there is a low risk of impacting customers and businesses, the risk to disruption to service levels would be minimised. This option will result in annual water savings for level 1 of up to 4.8 Ml/d, level 2 up to 12.6 Ml/d and Level 3 up to 35.15 Ml/d Ml/d per year. Impacts have been summarised as moderate beneficial and temporary.	None	Moderate beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Large	Moderate	Short-term	Temporary	High	Medium	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, by up to 4.8 Ml/d for level 1, level 2 up to 12.6 Ml/d and Level 3 up to 35.15 Ml/d Ml/d per year. Overall, the impact of this option on water has been summarised as moderate beneficial.	None	Moderate beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	N/A	N/A	N/A	N/A			No impacts on surface water or groundwater quality are anticipated.	None	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Large	Moderate	Short-term	Temporary	High	Medium	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, by up to 4.8 Ml/d for level 1, level 2 up to 12.6 Ml/d and Level 3 up to 35.15 Ml/d Ml/d per year. Overall, the impact of this option on water has been summarised as moderate beneficial.	None	Moderate beneficial
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	This option will not contribute to the long-term improvement in water efficiency.	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of pressure management on soil, geology and land use are anticipated.	None	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of pressure management on soil, geology and land use are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of pressure management on soil, geology and land use are anticipated.	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	The option will not involve any increased resource use, or increased CO2 emissions. No impacts of pressure management on air and climate are anticipated.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	Moderate	Long-term	Permanent	High	High	This option will have a beneficial impact on air and climate, acknowledging that reduced consumer demand for water will result in reduced requirement for abstraction at source, by up to 4.8 Ml/d for level 1, level 2 up to 12.6 Ml/d and Level 3 up to 35.15 Ml/d Ml/d per year. A corresponding reduction in greenhouse gas emissions as a result of the reduction in energy use for abstraction, is anticipated. Overall, the impact of this option on air and climate has been summarised as moderate beneficial.	None	Moderate beneficial
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Medium	High	Long-term	Temporary	Low	High	Demand measures are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Moderate beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	N/A	N/A	N/A	N/A	N/A	N/A	No impacts of pressure management on any archaeological or historic sites are anticipated.	None	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Large	Moderate	Short-term	Temporary	Low	Low	Pressure management is considered to have no impact on landscape and visual amenity, other than to acknowledge that reduced consumer demand for water will result in reduced requirement for abstraction at source, potentially reducing any impacts of drought related landscape or visual impacts. This option is not anticipated to have any implications for access to the countryside. Overall, the impacts have been assessed as negligible.	None	Negligible beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Large	Moderate	Long-term	Permanent	High	Medium	Reduction in water lost (Material Assets and Resource Use) has the potential to positively affect other topics including Biodiversity, Flora and Fauna, Water, and Landscape and Visual Amenity due to reduced requirement for abstraction at source. This impact has been summarised as minor beneficial.	None	Minor beneficial

Drought Plan Option Name: Delph Reservoir

Drought Plan Option Description: Reduce compensation flow from 3.7 to 1.0 Ml/d.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Delph and included an assessment of impacts of the drought option on biodiversity. Impacts on brown trout spawning and incubation were assessed as moderate should the drought permit coincide with spawning (October-December) and egg incubation (January-March) periods. Impacts on river fish populations (brown trout, bullhead, coarse fish, rheophilic fish), macroinvertebrates and riverine macrophytes and diatoms were assessed as minor adverse. Impacts on all other ecological receptors (otters, water voles, great crested newts, wading birds, wildfowl and gulls, riverine birds) and habitats were assessed as negligible, including negligible impacts on Nob End SSSI. Overall, the impact of the drought option is summarised as minor adverse and temporary.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The environmental assessment considered likely impacts on INNS. Impacts towards the risk of further spreading Himalayan balsam, giant hogweed, Rhododendron and the common carp were assessed. Due to the low sensitivity of these species, reductions in water levels and flow velocities are considered to be of negligible significance. Therefore, negligible impacts on the potential spread of INNS are anticipated.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water and maintain compensation releases if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. An Environmental Report has been prepared for drought contingency planning for the drought option at Delph. No third-party abstractors have been identified in the study area downstream of the Delph compensation release point. Therefore, negligible impacts were predicted. Overall, the impacts on population and human health have been assessed as minor beneficial, based on minor beneficial impacts on security of water supply.	Negligible adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Delph and included an assessment of impacts of the drought option on recreation including angling. Negligible impacts were predicted.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water and maintain compensation releases if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. An Environmental Report has been prepared for drought contingency planning for the drought option at Delph. The report concluded negligible adverse socio-economic impacts. Overall, the impacts on population and human health have been assessed as minor beneficial, based on minor beneficial impacts on security of water supply.	None	Minor beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial
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.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Delph and included an assessment of impacts of the drought option on hydrodynamics. The report concluded negligible to medium magnitude impacts on riverine hydrodynamics. Impacts on the reservoir were assessed as negligible. Overall, given the small scale of the reduction in compensation flow, the impacts on water have been assessed as minor adverse and temporary.	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Delph and included an assessment of impacts of the drought option on water quality. Water quality impacts of the drought option on the Eagley Brook (which receives compensation flow from Delph Reservoir) were assessed as negligible, whereas low magnitude and short-term impacts were concluded towards the Tonge Brook and Croal Brook. Impacts on the reservoir were assessed as negligible. Overall, the impacts on water have been assessed as minor adverse and temporary.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The drought permit will likely have some minor, but temporary adverse impact on water dependent ecosystems in the affected reaches. There are no third party abstractors in the zone of influence of the drought permit (downstream of the Delph compensation release point).	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Delph, and included an assessment of impacts of the drought option on fluvial geomorphology which concluded the negligible to medium magnitude impacts due to the effects of changes in sedimentation and reductions in depth wetted perimeter and mean velocity on habitat and geomorphology which may be expected. Overall, minor adverse effects are anticipated.	Minor adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Delph Reservoir. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Delph and included an assessment of impacts of the drought option on archaeology and cultural heritage. There are no scheduled monuments located in the area and no records were found to indicate that anaerobic / organic remains are located adjacent to the watercourses. A total of nine listed buildings were identified, but only three of these (former mills) occur immediately adjacent to the channels. Overall, the report concluded impacts on archaeology were predicted to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Delph and included an assessment of impacts of the drought option on landscape and visual amenity. The option is not within any designated landscape and impacts were assessed as negligible. The proposed Delph drought permit will result in more water being retained in Delph Reservoir, which would be expected to have a minor beneficial impact on aesthetics/landscape. Uncertainty remains regarding the hydrological and habitat and geomorphological impacts towards the impacted river waterbodies, but the character of the landscape is unlikely to be altered significantly. Impacts towards aesthetics were assessed as minor adverse and temporary.	Minor adverse	Minor beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Key inter-relationships include minor adverse impacts of hydrodynamics and water quality on biodiversity (fish and macrophyte populations).	Minor adverse	None

Drought Plan Option Name: Dovestone Reservoir

Drought Plan Option Description: Reduce compensation flow from 15.9 to 10.0 Ml/d

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on biodiversity. Moderate adverse impact on brown trout spawning and brown trout and bullhead egg incubation if the drought for a drought permit implemented during the autumn-spring period (October – February for brown trout, March – June for bullhead). Impacts on all other fish species/ life stages were deemed to be minor year-round although impacts are anticipated to be short-lived. The report concluded negligible adverse impacts on macrophytes and phytobenthos and in-river habitats. Negligible to minor adverse impacts on macroinvertebrates were additionally identified. Impacts on all other ecological receptors (otter, water vole, wading birds, wildfowl and gulls, riverine birds and great crested newts) were assessed as negligible. Overall, the impact of the drought option is summarised as minor adverse and temporary.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The environmental assessment considered likely impacts on INNS. Impacts towards the spread of INNS, including Japanese knotweed, Himalayan balsam, rhododendron, giant hogweed, Canadian waterweed, and common carp, were assessed. Although a reduction in water levels as a result of the drought permit could increase the area available for colonisation by riparian INNS, due to the low sensitivity of these species the influence of water level changes in the Chew Brook, River Tame and River Mersey is considered to result in, at most, a minor impact.	Minor adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water and maintain compensation releases if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone. Negligible impacts were predicted. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	Negligible adverse	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on recreation including angling. Negligible impacts were predicted.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water and maintain compensation releases if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. No impacts on abstractions on the Chew Brook or River Tame are predicted under any of the proposed drought permit options. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	None	Minor beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on hydrodynamics. The report concluded negligible to medium magnitude impacts on receiving watercourses downstream of the reservoir. Minor adverse impacts on riverine hydrodynamics are anticipated. The drought permit is predicted to have a low impact magnitude on Dovestone Reservoir. However, since the drought permit will slow the rate of drawdown, it is also predicted to have a small positive effect on reservoir water level and exposure. Overall, the impacts on water have been assessed as minor adverse and temporary.	Minor adverse	Negligible beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on water quality. The report concluded negligible to medium magnitude impacts on receiving watercourses downstream of the reservoir. Minor adverse impacts on water quality are anticipated. Impacts on the reservoir were assessed as negligible. Overall, the impacts on water have been assessed as minor adverse and temporary.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option and included an assessment of impacts on WFD deterioration. The report concluded negligible impacts on the current WFD status, future WFD objectives and supporting element status of all waterbodies.	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on fluvial geomorphology which identified that reductions in flow under the drought permit are predicted to cause modest reductions in wetted habitat space with potential for marginal exposure towards the riverbank at riffle locations. The report concluded negligible to medium magnitude impacts on receiving watercourses downstream of the reservoir, and no notable effects on geomorphology were modelled.	Minor adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Medium	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone. No impacts on soil, geology and land are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. The option involves modifications to compensation flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Low	Construction There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on archaeology and cultural heritage. The only scheduled monument identified was as post-medieval glassworks near Haughton Green. No records were found to indicate that anaerobic / organic remains are located within or immediately adjacent to the watercourses. A total of 22 listed buildings were identified, but only eight of these (mainly aqueducts and bridges) occur immediately adjacent to the channels. Overall, the report concluded impacts on archaeology were predicted to be negligible, given the absence of a clear pathway of impact on these features.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on landscape and visual amenity. Dovestone reservoir is just within the Peak District National Park boundary. The Environmental Report predicted minor adverse impacts on landscape and visual amenity, given that the magnitude of the changes in wetted perimeter are at worst expected to be of medium magnitude (Chew Brook) and otherwise low/ negligible.	Minor adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** Key inter-relationships include minor adverse impacts of hydrodynamics and water quality on biodiversity (macrophyte populations and in-river habitats).	Minor adverse	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on biodiversity. Moderate adverse impact on brown trout spawning and brown trout and bullhead egg incubation if the drought for a drought permit implemented during the autumn-spring period (October – February for brown trout, March – June for bullhead). Impacts on all other fish species/ life stages were deemed to be minor year-round although impacts are anticipated to be short-lived. The report concluded negligible adverse impacts on macrophytes and phytobenthos and in-river habitats. Negligible to minor adverse impacts on macroinvertebrates were additionally identified. Impacts on all other ecological receptors (otter, water vole, wading birds, wildfowl and gulls, riverine birds and great crested newts) were assessed as negligible. Overall, the impact of the drought option is summarised as minor adverse and temporary.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The environmental assessment considered likely impacts on INNS. Impacts towards the spread of INNS, including Japanese knotweed, Himalayan balsam, rhododendron, giant hogweed, Canadian waterweed, and common carp, were assessed. Although a reduction in water levels as a result of the drought permit could increase the area available for colonisation by riparian INNS, due to the low sensitivity of these species the influence of water level changes in the Chew Brook, River Tame and River Mersey is considered to result in, at most, a minor impact.	Minor adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	High	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water and maintain compensation releases if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone. Negligible impacts were predicted. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	Negligible adverse	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on recreation including angling. Negligible impacts were predicted.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	High	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water and maintain compensation releases if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. No impacts on abstractions on the Chew Brook or River Tame are predicted under any of the proposed drought permit options. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	None	Moderate beneficial
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.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on hydrodynamics. The report concluded negligible to medium magnitude impacts on receiving watercourses downstream of the reservoir. Minor adverse impacts on riverine hydrodynamics are anticipated. The drought permit is predicted to have a low impact magnitude on Dovestone Reservoir. However, since the drought permit will slow the rate of drawdown, it is also predicted to have a small positive effect on reservoir water level and exposure. Overall, the impacts on water have been assessed as minor adverse and temporary.	Minor adverse	Minor beneficial
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on water quality. The report concluded negligible to medium magnitude impacts on receiving watercourses downstream of the reservoir. Minor adverse impacts on water quality are anticipated. Impacts on the reservoir were assessed as negligible. Overall, the impacts on water have been assessed as minor adverse and temporary.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option and included an assessment of impacts on WFD deterioration. The report concluded negligible impacts on the current WFD status, future WFD objectives and supporting element status of all waterbodies.	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on fluvial geomorphology which identified that reductions in flow under the drought permit are predicted to cause modest reductions in wetted habitat space with potential for marginal exposure towards the riverbank at riffle locations. The report concluded negligible to medium magnitude impacts on receiving watercourses downstream of the reservoir, and no notable effects on geomorphology were modelled.	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone. No impacts on soil, geology and land are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. The option involves modifications to compensation flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	Construction There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on archaeology and cultural heritage. The only scheduled monument identified was as post-medieval glassworks near Haughton Green. No records were found to indicate that anaerobic / organic remains are located within or immediately adjacent to the watercourses. A total of 22 listed buildings were identified, but only eight of these (mainly aqueducts and bridges) occur immediately adjacent to the channels. Overall, the report concluded impacts on archaeology were predicted to be negligible, given the absence of a clear pathway of impact on these features.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Dovestone and included an assessment of impacts of the drought option on landscape and visual amenity. Dovestone reservoir is just within the Peak District National Park boundary. The Environmental Report predicted minor adverse impacts on landscape and visual amenity, given that the magnitude of the changes in wetted perimeter are at worst expected to be of medium magnitude (Chew Brook) and otherwise low/ negligible.	Minor adverse	None

Drought Plan Option Name: Fernilee Reservoir

Drought Plan Option Description: Reduce compensation flow from 13.6 to 7.0 Ml/d.

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Fernilee and included an assessment of impacts of the drought option options on biodiversity. No impacts on South Pennine SAC, Peak District Moors (South Pennine Moors Phase 1) SPA, Goyt Valley SSSI and Todd brook Reservoir and Combs Reservoir SSSIs are anticipated. Several Local Nature Reserves (LNRs) are located within the River Goyt valley; two are on, or directly adjacent to, the impacted reaches: Goytside Meadows, Mousley Bottom LNR and Chadkirk Country Estate, Poise Brook and Mersey Vale Nature Park LNRs. Brookfield Pond Local Nature Reserve is also located close to the River Goyt; however, the two are not hydrologically connected. It was considered unlikely that any of the flora and fauna supported by nature reserves located on, or directly adjacent to, the impacted reaches (The Goyt), would be directly impacted by changes in flow as a result of the drought permit and impacts are assessed as negligible. The report concluded moderate adverse impacts towards in-stream habitats for fish populations (brown trout (juvenile), bullhead and lamprey) and minor adverse impacts towards brown trout (spawning) and salmon upstream migration in the Goyt. Impacts on fish populations overall are reported as minor adverse, as these impacts are anticipated to be short-lived and the small reductions in wetted width and depth are considered unlikely to be of significance. Impacts towards other ecological receptors (otters, water vole, wading birds, wildfowl and gulls, riverine birds, great-crested newt, macrophytes and macroinvertebrates) were concluded as negligible.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The environmental assessment considered likely impacts on INNS. Negligible impacts on the potential spread of INNS (including Himalayan balsam, giant hogweed, and Japanese knotweed) are anticipated.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	Moderate	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as minor beneficial based on continued supply of drinking water.	None	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Short-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought options at Longdendale and included an assessment of impacts of the drought option on recreation, including walking and cycling around Fernilee Reservoir, which links to the adjacent Errwood Reservoir. The reservoir is not currently used for water sports; however, Errwood Sailing Club and Peak Paddlers operate from nearby Errwood Reservoir. The River Goyt is used for various recreational activities, including fishing, canoeing and kayaking. Overall, negligible effects are anticipated on recreation.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	Moderate	Short-term	Temporary	Low	Medium	**Operation** Fernilee Reservoir provides drinking water for the Stockport area, significantly contributing to the provision of a safe and reliable water resource. The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, given the lack of significant negative socio-economic impacts on the regional community, and the benefits of reduced reservoir drawdown, impacts on population and human health have been assessed as minor beneficial.	None	Minor beneficial
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	Negligible adverse	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Fernilee and included an assessment of impacts of the drought option options on hydrodynamics. Reduction in compensation flow to 7M/d was assessed as having a negligible impact on the water level and exposure of the Reservoir. Hydromorphological effects of the drought option on the River Mersey were considered. The drought option would cause limited reduction in depth and wetted width on the River Goyt, with effects being most noticeable upstream of the Randall Carr Brook confluence and less noticeable downstream of the Randall Carr Brook confluence. Minor adverse impacts are therefore anticipated towards the River Goyt. Overall, the impact on water has been summarised as minor adverse and temporary.	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Fernilee and included an assessment of impacts of the drought option options on water quality. The drought option is likely to increase the concentrations of ammonia and/or orthophosphate downstream of the two STWs that operate downstream of the Reservoir. Elsewhere in the reach downstream of the Reservoir, the scale of the effect on water quality is expected to be small as there are no STWs for which dilution would be an issue. The impact of the drought option on the water quality of the River Goyt is considered to be short- term and of small scale and therefore of negligible magnitude. With mitigation, the impacts on riverine water quality are predicted to be negligible to minor adverse. Negligible impact on reservoir water quality are anticipated. Overall, the impact on water has been summarised as minor adverse and temporary.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Short-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Fernilee and included an assessment of impacts of the drought option options on water quality and implications for achievement of WFD compliance. There are no predicted changes to WFD status. The potential impacts of the proposed drought option on the four downstream abstractors were considered and negligible impacts were concluded. Overall, negligible impacts are anticipated.	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Fernilee and included an assessment of impacts of the drought option options on fluvial geomorphology. The report concluded negligible to low magnitude of flow effects on sediment dynamics. Given the regional value of the geomorphology of the rivers, an overall minor impact on geomorphology is anticipated.	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Fernilee. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None

SEA topics and objectives		Assessment of								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium- term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to energy use and, therefore, greenhouse gas emissions, are envisaged.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Short-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought options at Fernilee and included an assessment of impacts of the drought option options on archaeology. The only scheduled monument identified was Marple aqueduct, which is located over the River Goyt. A total of 25 listed buildings were identified, but only nine of these (mainly aqueducts and bridges) occur immediately adjacent to the channels. No records were found to indicate that anaerobic / organic remains are located within or immediately adjacent to the watercourses. The heritage features identified as within or immediately adjacent to the rivers within the area of study (including Marple aqueduct) are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter and the overall impact on archaeology is considered to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Short-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought options at Fernilee and included an assessment of impacts of the drought option options on landscape. The aesthetics and landscape of the watercourses and reservoir in the Fernilee study area can be considered to be of parish/neighbourhood value. Fernilee reservoir is within the Peak District National Park boundary. Given that the magnitude of the changes in wetted perimeter, are likely to be negligible, it is anticipated that the proposed drought options will have a negligible impact on the aesthetics and landscape of the study area.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Key inter-relationships include the minor adverse impact of riverine flow reduction on water quality, fish populations and fluvial geomorphology.	Minor adverse	Negligible beneficial

Drought Plan Option Name: Jumbles Reservoir

Drought Plan Option Description: Reduce compensation flow from 19.9 Ml/d to 12 Ml/d.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on biodiversity. Impacts on juvenile brown trout, rheophilic coarse fish, bullhead and riverine macrophytes, diatoms and macroinvertebrates and in-river habitats have been assessed as negligible. Impacts on all other ecological receptors (otters, water voles, great crested newts, wading birds, wildfowl and gulls, riverine birds) were assessed as negligible. No designated sites are within the zone of influence of the drought option. The overall impact has been assessed as negligible adverse and temporary.	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The environmental assessment considered likely impacts on INNS. A reduction in water levels as a result of the drought permit may lead to an increase in the relative density of aquatic INNS (*Himalayan balsam* , giant hogweed, rhododendron, yellow archangel, common carp). However, reduced flow velocities would result in a decrease in the potential dispersal of these INNS. In addition, New Zealand flatworm may be detrimentally affected by changes in water quality as a result of the drought permit scenarios. Overall, negligible adverse impacts on the potential spread of INNS are anticipated.	Minor adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** Jumbles Reservoir is used as a compensation release reservoir only (no water is abstracted from Jumbles reservoir for public supply). The function of the drought option at Jumbles would be to conserve storage in the reservoir, thereby reducing the transfer of water needed from Wayoh and Entwistle reservoirs to Jumbles and maintaining water in those reservoirs for abstraction and public water supply. An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles. Impacts were assessed as negligible. Overall, the impacts on population and human health have been assessed as minor beneficial, based on minor beneficial impacts on security of water supply.	None	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** Jumbles Reservoir is used as a compensation release reservoir only (no water is abstracted from Jumbles reservoir for public supply). The function of the drought option at Jumbles would be to conserve storage in the reservoir, thereby reducing the transfer of water needed from Wayoh and Entwistle reservoirs to Jumbles and maintaining water in those reservoirs for abstraction and public water supply. An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on recreation including angling. Minor beneficial impacts were assessed due to the drought option resulting in more water being retained in Jumbles Reservoir, which would be expected to have a positive impact on tourism and recreational activities, e.g. sailing. Negligible impacts are expected towards angling groups.	Negligible adverse	Minor beneficial
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles. The report identified that third-party surface water abstractions are not currently known to be present within the study area. Impacts were assessed as negligible. Overall, the impacts on population and human health have been assessed as minor beneficial, based on minor beneficial impacts on security of water supply.	Negligible adverse	Minor beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on hydrodynamics. Given the negligible to medium magnitude of potential effects towards Jumbles Reservoir and impacted river waterbodies, with mitigation, impacts of the drought option on hydrology were assessed as minor adverse and temporary.	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on water quality. Negligible to low magnitude of potential effects were assessed towards Jumbles Reservoir and impacted river waterbodies.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option and included an assessment of impacts on WFD deterioration. The report concluded negligible impacts on the current WFD status, future WFD objectives and supporting element status of all waterbodies.	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on fluvial geomorphology. Negligible to medium magnitude impacts were assessed towards impacted river waterbodies due to changes in sedimentation and impacts towards in-stream habitats. Overall, minor adverse and temporary impacts are anticipated.	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and Climate	6.1 To reduce air pollutant emissions.	Small	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. The option involves modifications to compensation flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on archaeology and cultural heritage. There are no scheduled monuments located in the area and no records were found to indicate that anaerobic / organic remains are located adjacent to the watercourses. Four listed buildings were identified in the vicinity. Overall, the report concluded impacts on archaeology were predicted to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on landscape and visual amenity. The option is not within any designated landscape. Minor beneficial impacts were assessed due to the drought option resulting in more water being retained in Jumbles Reservoir, which would be expected to have a positive impact on aesthetics. Uncertainty remains regarding the hydrological and habitat and geomorphological impacts towards the impacted river waterbodies, but the character of the landscape is unlikely to be altered significantly. Impacts towards aesthetics were assessed as minor adverse and temporary.	Minor adverse	Minor beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** Key inter-relationships include minor adverse impacts of hydrodynamics and water quality on biodiversity (fish) and landscape.	Minor adverse	Negligible beneficial

Drought Plan Option Name: Jumbles Reservoir

Drought Plan Option Description: Reduce compensation flow from 19.9 Ml/d to 6 Ml/d.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on biodiversity. Impacts on brown trout, rheophilic coarse fish and bullhead are assessed as moderate. Impacts on all other fish macrophytes, diatoms and macroinvertebrates have been assessed as minor. Impacts on all other ecological receptors (otters, water voles, great crested newts, wading birds, wildfowl and gulls, riverine birds) were assessed as negligible. No designated sites are within the zone of influence of the drought option. The overall impact has been assessed as minor adverse and temporary.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** The environmental assessment considered likely impacts on INNS. A reduction in water levels as a result of the drought permit may lead to an increase in the relative density of aquatic INNS (*Himalayan balsam* , giant hogweed, rhododendron, yellow archangel, common carp). However, reduced flow velocities would result in a decrease in the potential dispersal of these INNS. In addition, New Zealand flatworm may be detrimentally affected by changes in water quality as a result of the drought permit scenarios. Overall, negligible adverse impacts on the potential spread of INNS are anticipated.	Minor adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	High	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** Jumbles Reservoir is used as a compensation release reservoir only (no water is abstracted from Jumbles reservoir for public supply). The function of the drought option at Jumbles would be to conserve storage in the reservoir, thereby reducing the transfer of water needed from Wayoh and Entwistle reservoirs to Jumbles and maintaining water in those reservoirs for abstraction and public water supply. An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles. Impacts were assessed as negligible. Overall, the impacts on population and human health have been assessed as moderate beneficial, based on moderate beneficial impacts on security of water supply.	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** Jumbles Reservoir is used as a compensation release reservoir only (no water is abstracted from Jumbles reservoir for public supply). The function of the drought option at Jumbles would be to conserve storage in the reservoir, thereby reducing the transfer of water needed from Wayoh and Entwistle reservoirs to Jumbles and maintaining water in those reservoirs for abstraction and public water supply. An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on recreation including angling. Minor beneficial impacts were assessed due to the drought option resulting in more water being retained in Jumbles Reservoir, which would be expected to have a positive impact on tourism and recreational activities, e.g. sailing. Negligible impacts are expected towards angling groups.	Negligible adverse	Minor beneficial
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	High	Long-term	Temporary	Low	High	**Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles. The report identified that third-party surface water abstractions are not currently known to be present within the study area. Impacts were assessed as negligible. Overall, the impacts on population and human health have been assessed as moderate beneficial, based on moderate beneficial impacts on security of water supply.	Negligible adverse	Moderate beneficial
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Medium	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on hydrodynamics and concluded medium impacts on river flows. Impacts of the drought option on hydrology are assessed as moderate adverse and temporary.	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Medium	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on water quality. Medium magnitude of potential effects was assessed towards impacted river waterbodies.	Moderate adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option and included an assessment of impacts on WFD deterioration. The report concluded minor impacts on the current WFD status, future WFD objectives and supporting element status of all waterbodies.	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on fluvial geomorphology. Negligible to medium magnitude impacts were assessed towards impacted river waterbodies due to changes in sedimentation and impacts towards in-stream habitats. Overall, minor adverse and temporary impacts are anticipated.	Minor adverse	Negligible beneficial
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Small	Moderate	Long-term	Temporary	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. The option involves modifications to compensation flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Medium	High	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Moderate beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on archaeology and cultural heritage. There are no scheduled monuments located in the area and no records were found to indicate that anaerobic / organic remains are located adjacent to the watercourses. Four listed buildings were identified in the vicinity. Overall, the report concluded impacts on archaeology were predicted to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Jumbles and included an assessment of impacts of the drought option on landscape and visual amenity. The option is not within any designated landscape. Minor beneficial impacts were assessed due to the drought option resulting in more water being retained in Jumbles Reservoir, which would be expected to have a positive impact on aesthetics. Uncertainty remains regarding the hydrological and habitat and geomorphological impacts towards the impacted river waterbodies, but the character of the landscape is unlikely to be altered significantly. Impacts towards aesthetics were assessed as minor adverse and temporary.	Minor adverse	Minor beneficial
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** Key inter-relationships include moderate adverse impacts of hydrodynamics and water quality on biodiversity (fish) and landscape.	Minor adverse	Negligible beneficial

Drought Plan Option Name: Longdendale Reservoirs

Drought Plan Option Description: Reduce compensation flow from 45.5 to 25.0 Ml/d

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on biodiversity. Overall, the impacts on brown trout, bullhead, brook lamprey and coarse fish were summarised as minor to moderate adverse. Impacts on a salmon (all life stages) are assessed as negligible all year round. Minor adverse impacts on macrophytes, phytobenthos and macroinvertebrates were also predicted. The impacts on other ecological receptors (otter, water vole, wading birds, wildfowl and gulls, riverine birds and great crested newts) were assessed as negligible. Impacts on designated sites, including Compstall Nature Reserve SSSI, are assessed as negligible.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Low	**Operation** The environmental assessment considered likely impacts on INNS. The drought permit involves only a change to existing compensation release and does not involve intra or inter-catchment transfer and will not result in the introduction of new INNS. The drought permit implementation alone, and for all in-combination scenarios (with possible Fernilee and Dovestone drought permits) is considered likely to result in a negligible impact on the INNS communities of the affected reservoir and rivers. Negligible impacts on the potential spread of INNS are anticipated.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	Moderate	Long-term	Temporary	Medium	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as major beneficial based on continued supply of drinking water.	None	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on recreation, including angling. The assessment concluded a minor negative impact predicted on the aesthetic value of the river channels.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	Moderate	Long-term	Temporary	Medium	High	**Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as major beneficial based on continued supply of drinking water.	None	Major beneficial
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Medium	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on hydrodynamics. Reduction in compensation flow to 25M/d was assessed as having medium adverse impacts on riverine hydrodynamics. Negligible impact on reservoir hydrodynamics are anticipated. Overall, the impact on water has been summarised as moderate adverse and temporary.	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on water quality. With mitigation, the impacts on riverine water quality are predicted to be low to medium adverse. Overall, the impact on water quality has been summarised as minor adverse and temporary.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	Moderate	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The drought permit will likely have some minor, but temporary adverse impact on water dependent ecosystems in the affected reach. There are three abstractions in the zone of influence of the drought permit. The environmental assessment concluded that impacts on other abstractors are considered negligible.	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on fluvial geomorphology. The report concluded negligible to medium magnitude of flow effects on sediment dynamics. Given the regional value of the geomorphology of the rivers, an overall minor impact on geomorphology is anticipated.	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Medium	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Small	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to energy use and, therefore, greenhouse gas emissions, are envisaged.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on archaeology. The only scheduled monument identified was Marple aqueduct, which is located over the River Goyt. There were a number of listed buildings identified. No records were found to indicate that anaerobic / organic remains are located within or immediately adjacent to the watercourses. The heritage features identified as within or immediately adjacent to the rivers within the area of study (including Marple aqueduct) are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter and the overall impact on archaeology is considered to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on landscape. The aesthetics and landscape of the watercourses and reservoir in the Longdendale study area can be considered to be of parish/neighbourhood value. Bottoms Reservoir (the lowest reservoir in the Longdendale reservoir chain from which the compensation flow to the River Etherow is released) is just within the Peak District National Park boundary. Given that the magnitude of the changes in wetted perimeter, are likely to be low, it is anticipated that the proposed drought option will have a minor adverse temporary impact on the aesthetics and landscape of the study area.	Minor adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Key inter-relationships include the minor adverse impact of riverine flow reduction on water quality, fish populations and landscape and visual amenity.	Minor adverse	Negligible beneficial

Drought Plan Option Name: Longdendale Reservoirs

Drought Plan Option Description: Reduce compensation flow from 45.5 to 15.0 Ml/d

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on biodiversity. Overall, the impacts on brown trout, bullhead, brook lamprey and coarse fish were summarised as minor to moderate adverse. Impacts on a salmon (all life stages) are assessed as negligible all year round. Minor adverse impacts on macrophytes, phytobenthos and macroinvertebrates were also predicted. The impacts on other ecological receptors (otter, water vole, wading birds, wildfowl and gulls, riverine birds and great crested newts) were assessed as negligible. Impacts on designated sites, including Compstall Nature Reserve SSSI, are assessed as negligible.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The environmental assessment considered likely impacts on INNS. The drought permit involves only a change to existing compensation release and does not involve intra or inter-catchment transfer and will not result in the introduction of new INNS. The drought permit implementation alone, and for all in-combination scenarios (with possible Fernilee and Dovestone drought permits) is considered likely to result in a negligible impact on the INNS communities of the affected reservoir and rivers. Negligible impacts on the potential spread of INNS are anticipated.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	Moderate	Long-term	Temporary	Medium	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as major beneficial based on continued supply of drinking water.	None	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on recreation, including angling. The assessment concluded a minor negative impact predicted on the aesthetic value of the river channels.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	Moderate	Long-term	Temporary	Medium	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as major beneficial based on continued supply of drinking water.	None	Major beneficial
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Medium	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on hydrodynamics. Reduction in compensation flow to 15M/d was assessed as having medium adverse impacts on riverine hydrodynamics. Negligible impact on reservoir hydrodynamics are anticipated. Overall, the impact on water has been summarised as moderate adverse and temporary.	Moderate adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on water quality. With mitigation, the impacts on riverine water quality are predicted to be low to medium adverse.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	Moderate	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The drought permit will likely have some minor, but temporary adverse impact on water dependent ecosystems in the affected reach. There are three abstractions in the zone of influence of the drought permit. The environmental assessment concluded that impacts on other abstractors are considered negligible.	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on fluvial geomorphology. The report concluded negligible to medium magnitude of flow effects on sediment dynamics. Given the regional value of the geomorphology of the rivers, an overall minor impact on geomorphology is anticipated.	Minor adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Medium	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Small	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to energy use and, therefore, greenhouse gas emissions, are envisaged.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Medium	High	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Moderate beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on archaeology. The only scheduled monument identified was Marple aqueduct, which is located over the River Goyt. There were a number of listed buildings identified. No records were found to indicate that anaerobic / organic remains are located within or immediately adjacent to the watercourses. The heritage features identified as within or immediately adjacent to the rivers within the area of study (including Marple aqueduct) are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter and the overall impact on archaeology is considered to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Longdendale and included an assessment of impacts of the drought option on landscape. The aesthetics and landscape of the watercourses and reservoir in the Longdendale study area can be considered to be of parish/neighbourhood value. Bottoms Reservoir (the lowest reservoir in the Longdendale reservoir chain from which the compensation flow to the River Etherow is released) is just within the Peak District National Park boundary. Given that the magnitude of the changes in wetted perimeter, are likely to be low, it is anticipated that the proposed drought option will have a minor adverse temporary impact on the aesthetics and landscape of the study area.	Minor adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Key inter-relationships include the minor adverse impact of riverine flow reduction on water quality, fish populations and landscape and visual amenity.	Minor adverse	Negligible beneficial

Drought Plan Option Name: River Lune LCUS abstraction

Drought Plan Option Description: Reduce prescribed flow from 365.0 to a minimum of 200 Ml/d.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over- abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune and included an assessment of impacts of the drought option on biodiversity. The report concluded negligible impacts on fish populations (salmon smolt, sea trout smolt, Atlantic salmon, brown trout, bullhead, coarse fish and lamprey species). Impacts macroinvertebrates are assessed as negligible. Impacts on all other ecological receptors (macrophytes and diatoms, macro-invertebrates, wildfowl, gulls, piscivorous birds and other riverine birds) were assessed as negligible to minor. No impacts on the Morecombe Bay SAC are anticipated. Overall, the impact of the drought option is summarised as negligible adverse and temporary.	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** The drought permit involves only a change to existing minimum prescribed flow and does not involve intra or inter-catchment transfer and will not result in the introduction of new INNS. The drought permit implementation alone is considered likely to result in a negligible impact on the INNS (including Japanese knotweed and common cord-grass) of the affected reservoir and rivers, given that an overall reduction in the potential dispersal of INNS would be expected.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	High	Long-term	Temporary	High	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** The drought powers (reduction in hands-off flow) would allow water resources to be supported for a longer period, preserving reservoir storages elsewhere in the system, and at greater volumes than would otherwise be possible. However, if weather conditions prove to be favourable, abstraction would only be carried out under normal conditions. Only in sustained dry conditions would the drought powers be required. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune. Overall, the impacts on population and human health have been assessed as moderate beneficial, taking into account minor negative impacts on recreation (canoeing & rowing) and on other abstractors and major beneficial impacts on security of water supply.	Negligible adverse	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Medium	High	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune and included an assessment of impacts of the drought option on recreation including angling and navigation. Minor adverse impacts were predicted for angling, canoeing, tourism and recreation, and navigation. However, net beneficial effects are anticipated for the Haaf net fishery on the Lune estuary, due to potentially increased catches of salmon.	Minor adverse	Minor beneficial
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	High	Long-term	Temporary	High	Medium	**Operation** The drought powers (reduction in hands-off flow) would allow water resources to be supported for a longer period, preserving reservoir storages elsewhere in the system, and at greater volumes than would otherwise be possible. However, if weather conditions prove to be favourable, abstraction would only be carried out under normal conditions. Only in sustained dry conditions would the drought powers be required. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Minor adverse impacts on other amenity and commercial abstractors were identified, which could result in adverse local socio-economic impacts. Overall, the impacts on population and human health have been assessed as moderate beneficial, taking into account minor negative impacts on recreation and on other abstractors and major beneficial impacts on security of water supply.	Negligible adverse	Major beneficial
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.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to flow release only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune and included an assessment of impacts of the drought option on hydrodynamics. Impacts on river flows were assessed as short term and negligible, given that the drought option would not increase the frequency of the lowest flows (<200 Ml/d). Overall, the impacts on water have been assessed as negligible.	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune and included an assessment of impacts of the drought option on water quality. Impacts on water quality are negligible. Overall, the impacts on water quality have been assessed as negligible adverse and temporary.	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Small	Moderate	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune and included an assessment of impacts of towards other abstractors. There are three relatively large industrial abstractions within Skerton pool. In operation, although sufficient depth will always be present for existing abstraction pipework to remain submerged, some uncertainty remains given the inability to confirm recent years abstraction experiences from one third party abstraction. Therefore, a low magnitude of effect is concluded, and the resultant impact significance is determined to be negligible. No change in the WFD status of the River Lune is predicted with respect to water quality.	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune and included an assessment of impacts of the drought option on fluvial geomorphology which the report concluded to be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to hands-off flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to hands-off flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to hands-off flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to hands-off flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to flow release only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune and included an assessment of impacts of the drought option on archaeology and cultural heritage. The four heritage features identified as occurring within or immediately adjacent to the River Lune were assessed as unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter. The overall impact on archaeology is considered to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at the River Lune and included an assessment of impacts of the drought option on landscape and visual amenity. The River Lune LCUS pumping station is just within the Forest of Bowland AONB. However, any impacts would be short-term and the landscape character would be unlikely to change (of local value). The Environmental Report identified the impact on landscape and visual amenity as minor adverse or negligible and temporary.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to hands-off flow only. **Operation** Key inter-relationships include minor adverse impacts of hydrodynamics on recreation (including angling), navigation and other users (abstractors).	Minor adverse	Negligible beneficial

Drought Plan Option Name: Rivington Reservoirs – Brinscall Brook

Drought Plan Option Description: Reduce compensation flow from 3.9 to 2.0 Ml/d.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook) and included an assessment of impacts of the drought option on biodiversity. The environmental study identified moderate impacts on fish species including trout and bullhead at any time of year. Impacts on all other receptors were concluded as minor or negligible. Impacts on in-river habitats within the study area were assessed as minor adverse. Overall, the impacts on biodiversity have been assessed as minor adverse and temporary.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The environmental assessment considered likely impacts on INNS. Negligible impacts on the potential spread of INNS are anticipated.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	High	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook) and included an assessment of impacts of the drought option on recreation including angling. Impacts were assessed as negligible. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook). Impacts were assessed as negligible.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	High	Long-term	Temporary	Low	High	**Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	None	Moderate beneficial
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.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involve modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial
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.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook) and included an assessment of impacts of the drought option on hydrology . The report concluded a minor adverse impact on hydrodynamics of the affected riverine water bodies (including wetted perimeter), and a negligible impact on reservoir hydrodynamics. The Environmental Report considered cumulative effects of concurrent operation with the Rivington - White Coppice drought option, and concluded minor adverse effects on hydrodynamics in the River Mersey. Overall, the impact is summarised as minor adverse and temporary.	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook) and included an assessment of impacts of the drought option on water quality. Impacts on water quality were assessed as minor adverse. Overall, the impact is summarised as minor adverse and temporary.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	Moderate	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The drought permit will likely have some minor, but temporary adverse impact on water dependent ecosystems in the affected reach.	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook) and included an assessment of impacts of the drought option on fluvial geomorphology which the report concluded to be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook). No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. The option involves modifications to compensation flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook) and included an assessment of impacts of the drought option on archaeology and cultural heritage. The only scheduled monument identified in the study area was Croston Town Bridge, which is located over the River Yarrow. No records were found to indicate that anaerobic / organic remains are located adjacent to the watercourses. The report concluded that heritage features identified as occurring within or immediately adjacent to the rivers within the area of study are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter and the overall impact on archaeology is negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (Brinscall Brook) and included an assessment of impacts of the drought option on landscape and visual amenity. The report concluded that the magnitude of changes in wetted perimeter are likely to be minor and are anticipated to have a negligible impact on the landscape and visual amenity.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Key inter-relationships include the potential minor adverse impacts of hydrodynamics and water quality on riverine fish populations.	Minor adverse	Negligible beneficial

Drought Plan Option Name: Rivington Reservoirs – White Coppice

Drought Plan Option Description: Reduce compensation flow from 4.9 to 2.0 Ml/d

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice) and included an assessment of impacts of the drought option on biodiversity. The environmental study identified moderate impacts on fish species including trout and bullhead at any time of year. Impacts on all other receptors were concluded as minor or negligible. Impacts on in-river habitats within the study area were assessed as minor adverse. Overall, the impacts on biodiversity have been assessed as minor adverse and temporary.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The environmental assessment of the drought permit considered the risk of spread of INNS. Negligible impacts on the potential spread of INNS are anticipated.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	Moderate	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice). Impacts were assessed as negligible. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice) and included an assessment of impacts of the drought option on recreation including angling. Impacts were assessed as negligible.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	High	Long-term	Temporary	Low	High	**Operation** The reduction in compensation flow under drought powers would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	None	Moderate beneficial
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.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involve modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial
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.	Medium	High	Long-term	Temporary	Low	Low	**Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice) and included an assessment of impacts of the drought option on hydrology. The report concluded a minor adverse impact on hydrodynamics of the affected riverine water bodies, and a negligible impact on reservoir hydrodynamics. The Environmental Report considered cumulative effects of concurrent operation with the Rivington - Brinscall Brook drought option, and concluded minor adverse effects on hydrodynamics in the River Mersey. Overall, the impact is summarised as minor adverse and temporary.	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice) and included an assessment of impacts of the drought option on water quality. The report concluded a minor adverse impact on water quality. Overall, the impact is summarised as minor adverse and temporary.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	Moderate	Long-term	Temporary	Low	Medium	**Operation** The drought permit will likely have some minor, but temporary adverse impact on water dependent ecosystems in the affected reach.	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice) and included an assessment of impacts of the drought option on fluvial geomorphology which the report concluded to be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice). No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice) and included an assessment of impacts of the drought option on archaeology and cultural heritage. The only scheduled monument identified in the study area was Croston Town Bridge, which is located over the River Yarrow. No records were found to indicate that anaerobic / organic remains are located adjacent to the watercourses. The report concluded that heritage features identified as occurring within or immediately adjacent to the rivers within the area of study are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter and the overall impact on archaeology is negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Rivington (White Coppice) and included an assessment of impacts of the drought option on landscape and visual amenity which the report concluded to be negligible.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Key inter-relationships include the potential minor adverse impacts of hydrodynamics and water quality on riverine fish populations and impact on water dependent ecosystems in the affected reach.	Minor adverse	Negligible beneficial

Drought Plan Option Name: Ullswater

Drought Plan Option Description: Reduce hands-off flow conditions to a minimum of 175 Ml/d. Relax 12-month rolling abstraction license limit.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** Ullswater and the River Eamont form part the Eden catchment and are included in the River Eden SAC and River Eden and Tributaries SSSI. An Environmental Report has been prepared for drought contingency planning for Ullswater, and includes an assessment of the hydrological, water quality and ecological impacts of the drought option. The report concluded that there would be negligible impacts on fish (including Arctic charr, European eel, perch, minnow, three-spined stickleback, lamprey species, salmon and sea trout), birds, mammals (otter) and invertebrates (including the white-clawed crayfish). No impacts on freshwater macrophyte communities are anticipated when implementing the drought order. No adverse impacts on SACs or SSSI sites are anticipated.	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** The environmental assessment considered likely impacts on INNS. Negligible impacts on the potential spread of INNS, including Himalayan balsam, are anticipated.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** The water abstracted from Ullswater under drought powers would augment the storage in Haweswater Reservoir if dry weather continues. Without these powers, in a severe drought, there would be a growing risk of a storage deficit, placing public water supplies at an unacceptable risk. This option is, therefore, deemed to have a beneficial impact in ensuring security of supply of drinking water. Overall, the impacts on population and human health have been assessed as minor beneficial based on continued provision of public water supplies.	None	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** Recreational activities on Ullswater include angling, boating, commercial navigation (including lake cruisers) and watersports. With implementation of this drought option there would be no deviation in lake level outside the normal envelope of extremes at any time of the year. Impacts on recreational and / or commercial activities are, therefore, negligible. Canoeing is carried out on the Eamont, mainly from downstream of Eamont Bridge. Other recreational activities along the Eamont include angling and walking. Implementation of the drought option will have negligible impacts on angling and canoeing.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** The water abstracted from Ullswater under drought powers would augment the storage in Haweswater Reservoir if dry weather continues. Without these powers, in a severe drought, there would be a growing risk of a storage deficit, placing public water supplies at an unacceptable risk. This option is, therefore, deemed to have a beneficial impact in ensuring security of supply of drinking water.	None	Minor beneficial
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.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** The abstraction of water from Ullswater is via pumped abstraction and will result in associated increase in resource use. The option will make use of existing infrastructure.	Negligible adverse	Negligible beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	Moderate	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** The abstraction of water from Ullswater is via pumped abstraction and will increase energy consumption. Overall, the impact has been assessed as minor adverse.	Minor adverse	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** An Environmental Report has been prepared for drought contingency planning for Ullswater and includes an assessment of the hydrological impacts of the drought option. The report concluded little effect of the drought option on water levels in Ullswater, which would remain within natural lake level variability and negligible impacts on flow in the River Eamont.	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** An Environmental Report has been prepared for drought contingency planning for Ullswater and includes an assessment of the water quality impacts of the drought option. The report concluded that implementation of the drought option would result in negligible impacts to the physical environment of the river including water quality and hydrodynamics.	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** The drought permit will have a negligible impact on water dependent ecosystems in the affected reach. Impacts towards other abstractors were assessed as negligible.	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** There would be no significant land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for Ullswater and includes an assessment of geomorphological impacts. Overall, the impacts on geomorphology have been summarised as negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** There would be no significant land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for Ullswater. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** The abstraction of water from Ullswater is via pumped abstraction and a small increase in abstraction will increase air emissions. This impact has been assessed as negligible adverse.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** The abstraction of water from Ullswater is via pumped abstraction and will increase energy consumption and, therefore, greenhouse gas emissions. This impact has been assessed as negligible adverse.	Negligible adverse	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** Eamont Bridge is a scheduled ancient monument. Under drought option conditions, flow variation in the River Eamont is likely to be within the natural fluctuations experienced in the river, although minor adverse impacts to flows may occur in autumn / winter. However, no significant implications for Eamont Bridge or any previously undiscovered anaerobic / organic remains are anticipated. There is one Scheduled Ancient Monument within the zone of influence of the drought permit on Ullswater - a Moated site and annexe south of Gale Bay. No impacts on archaeology are anticipated as there will be no reduction in lake level outside of the normal lake level envelope. Impacts on archaeology and cultural heritage are, therefore, considered to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** Ullswater and the River Eamont are set within the Lake District National Park. An Environmental Report has been prepared for drought contingency planning for Ullswater and includes an assessment of landscape impacts. There would be no deviation in lake level outside the normal envelope of extremes at any time of the year therefore, the drought permit is considered to have a negligible impact on the landscape and visual amenity of Ullswater and its environs. In the River Eamont, flow variation is likely to be within the natural fluctuations experienced in the river, and the impact on visual amenity is negligible.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime only. **Operation** Key inter-relationships in the operational phase include flow mediated impacts on biodiversity, noting the potential benefits resulting from augmented flows in spring / summer.	Negligible adverse	Negligible beneficial

Drought Plan Option Name: Lake Vyrnwy

Drought Plan Option Description: Reduce compensation flow from 45.0 to 25.0 Ml/d

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option at Vyrnwy and included an assessment of impacts of the drought option on biodiversity. Potential effects on designated sites are not anticipated. The significance of impacts on riverine fish species (brown trout, bullhead, coarse fish, European eel, lamprey and Atlantic salmon) are anticipated to be minor. The assessment concluded negligible to minor adverse impacts on macro-invertebrate communities. Impacts on bryophytes and macrophyte communities are anticipated to be negligible to minor. The Severn Estuary SAC is not in the zone of hydrological influence of the scheme. There is no hydrological connectivity of the option with the Montgomery Canal SAC. Overall, the impact of the drought option is summarised as minor adverse and temporary.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option, therefore there is no pathway for introduction of new INNS. **Operation** The Environmental Assessment Report identified a total of 11 INNS species in the River Vyrnwy. These comprised of three existing macroinvertebrate INNS (the American signal crayfish, the New Zealand mud snail and a freshwater shrimp), five existing INNS aquatic macrophytes (Water Fern, Duckweed, Parrot's Feather, Nuttalls pondweed and Canadian pondweed) and three existing invasive riparian plants (Japanese knotweed, Himalayan balsam and *Rhododendron ponticum*) The magnitude of potential impacts from the above INNS as a result of the implementation of the drought permit ranged from negligible to low, of negligible significance.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Medium	High	Long-term	Temporary	Medium	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** The reduction in compensation flow under drought powers would enable the continued supply of water to the regional population and would also serve to maintain compensation releases if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. An updated Environmental Assessment Report has been prepared for drought contingency planning for the drought option at Vyrnwy. Overall impacts on population and human health have been assessed as moderate beneficial, based on negligible impacts on recreational activities around Vyrnwy Reservoir, including angling, and minor adverse impacts on two other abstractors and moderate beneficial impacts on security of water supply.	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Medium	**Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option at Vyrnwy and included an assessment of impacts of the drought option on recreation including angling, tourism and recreation. Any impacts (summer only) for recreation and angling (on the downstream river only) would be localised and temporary. Minor adverse impacts were concluded for waterbodies upstream of the River Banwy confluence and negligible impacts for downstream waterbodies. Given that there would be no significant effects on PROWs and neutral impacts towards activities including canoeing and kayaking, overall minor adverse effects are anticipated.	Minor adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Medium	High	Long-term	Temporary	Medium	Medium	**Operation** The reduction in compensation flow under drought powers would enable the continued supply of water to the regional population and would also serve to maintain compensation releases if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. A minor adverse impact on two other abstractors (HEP schemes) has been identified, which could result in moderate adverse local socio-economic impacts. However, with mitigation measures, the residual impact was assessed as minor adverse.	Minor adverse	Moderate beneficial

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. The option involves modifications to compensation flow only and no changes to energy use, generated waste or sustainable designs are envisaged. The option will make use of existing infrastructure.	None	Negligible beneficial
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.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Option involves modifications to compensation flow only and no changes to energy use are envisaged.	None	Negligible beneficial
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Vyrnwy and included an assessment of impacts of the drought option on hydrodynamics. The report concluded negligible to medium magnitude impact on downstream flows, with overall minor adverse impacts on riverine hydrodynamics. Impacts on the reservoir were assessed as negligible. Overall, the impacts on water have been assessed as minor adverse and temporary.	Minor adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Vyrnwy and included an assessment of impacts of the drought option on water quality. The report concluded negligible to minor magnitude of changes to water quality, with minor adverse impacts on water quality. Impacts on the reservoir were assessed as negligible. Overall, the impacts on water quality have been assessed as minor adverse and temporary.	Minor adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option at Vyrnwy and included an assessment of impacts on WFD deterioration. The report concluded negligible impacts on the current WFD status, future WFD objectives and supporting element status of all waterbodies.	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Vyrnwy and included an assessment of impacts of the drought option on fluvial geomorphology which concluded the impacts to be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Medium	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Vyrnwy. No impacts on land, soils and geology are anticipated.	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Small	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. Option involves modifications to compensation flow only and no changes to infrastructure use and will therefore not impact air quality.	None	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on air quality are anticipated. The option involves modifications to compensation flow only and no changes to energy use, and therefore greenhouse gas emissions, are envisaged.	None	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Medium	High	Long-term	Temporary	Low	High	Construction There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Moderate beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option at Vyrnwy and included an assessment of impacts of the drought option on archaeology and cultural heritage. A total of 85 sites were identified along the immediate riparian corridor, comprising a mixture of dwellings, historic agricultural buildings, vicarages, cairns, mills, plaques, workshops, bridges, weirs, earthworks, roads and trackways, electricity generating sites, battle sites, culverts, and gardens. The report concluded that the heritage features identified as occurring within or immediately adjacent to the rivers within the area of study are of low value and given that the majority are not sensitive to water level or wetted perimeter change, they are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter. Impacts on archaeology have been assessed as negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option at Vyrnwy and included an assessment of impacts of the drought option on landscape and visual amenity. The option is not within any designated landscape and given that the magnitude of changes in wetted perimeter are likely to be minor, the change to drought permit wetted perimeter would be unlikely to detract from the aesthetic value of the watercourse and potential temporary effects are assessed as negligible.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** Key inter-relationships include minor adverse impacts of hydrodynamics and water quality on biodiversity (riverine fish, macrophyte populations and in-river habitats).	Minor adverse	Negligible beneficial

Drought Plan Option Name: Lake Windermere

Drought Plan Option Description: Reduce hands-off flow conditions to a minimum of 95 Ml/d. Relax 12-month rolling abstraction license limit.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Lake Windermere, and includes an assessment of the hydrological, water quality and ecological impacts of the drought option scenario. Windermere is designated as a County Wildlife Site, and a small proportion of Windermere is within the Low Wray Bay Site of Special Scientific Interest (SSSI). Other sites within the study area include Roudsea Wood and Mossess SAC/SSSI and Morecambe Bay SAC/SPA/SSSI and there are also various Local Wildlife Sites (LWS) and Sites of Invertebrate Significance (SIS) located within the study area. Impacts on designated sites are predicted to be negligible. Predicted reductions in depth and wetted perimeter in the River Leven pose a low risk of dewatering of salmonid and lamprey spawning habitat, and/or exposure of eggs/alevins which are assessed as a moderate impact on juvenile Atlantic salmon, sea trout, brown trout, brook lamprey, river lamprey, sea lamprey and bullhead. Under the drought permit draw down of lake levels would not be beyond those which may occur under baseline natural drought conditions, and the impact on other fish and white-clawed crayfish, salmonid, bullhead and lamprey), macrophytes and invertebrates will be negligible and short term. Likewise, impacts towards protected species (waterbirds, otter, smooth newt and Eurasian water shrew) are expected to be negligible, given the negligible changes to lake level and shoreline exposure and negligible to low impacts on river flow and levels predicted under the drought permit scenario. Overall, this impact has been assessed as minor adverse and temporary.	Minor adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	Low	Low	An Environmental Report has been prepared for drought contingency planning for the drought option at Lake Windermere, which considered the risk of introducing or spreading of seven non-native INNS. It concluded that given the frequency of events in relation to the drought permit where HoF levels would fall below the baseline scenario, and the negligible changes to lake level and shoreline exposure predicted, potential INNS risks are not predicted. Negligible effects are anticipated.	Negligible adverse	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	High	Long-term	Temporary	High	High	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** The water abstracted from Windermere under a drought option would effectively reduce abstraction of water from Haweswater reservoir and other UU reservoirs and thus conserve reservoir storage if dry weather continues. This measure will serve to safeguard public water supplies. An Environmental Report has been prepared for drought contingency planning for the drought option at Lake Windermere. which concluded negligible adverse effects. Overall, the impact of the drought option on population and human health has been assessed as major beneficial based on continued provision of public water supplies.	None	Major beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Lake Windermere and includes an assessment of the impacts on recreation. Water-based commercial (including lake cruisers) and recreational activities will not be significantly affected and the impact will be negligible. Negligible impacts on angling opportunity are anticipated. Overall, given that the drought permit is predicted to have a negligible impact on lake levels and shoreline exposure and the River Leven flow regime throughout the study area in comparison with the baseline situation. It is therefore unlikely that there would be any adverse impact on Lake Windermere or River Leven users and the local visitor economy and negligible effects are anticipated.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	High	Long-term	Temporary	High	High	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** The water abstracted from Windermere under a drought option would effectively reduce abstraction of water from Haweswater reservoir and other UU reservoirs and thus conserve reservoir storage if dry weather continues. This measure will serve to safeguard public water supplies.	None	Major beneficial
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.	Small	High	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to abstraction regime and compensation flow only. **Operation** The abstraction of water from Windermere is via pumped abstraction and will increase energy consumption. This impact has been assessed as minor adverse and temporary. The option will make use of existing infrastructure.	Minor adverse	Negligible beneficial
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.	N/A	N/A	N/A	N/A	N/A	N/A	No opportunities to promote the sustainable management of natural resources have been identified for this option.	None	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for Windermere and includes an assessment of the hydrological and ecological impacts of drought option. The conclusions of the report were that the drought option would have a negligible impact on lake levels and shoreline exposure throughout the study area in comparison with the baseline situation. Hence this drought option would not significantly impact on lake levels during periods of summer drought, constituting only a negligible impact on water levels, and would not significantly influence the minimum flow seen in the River Leven, but would slightly increase the duration of low flows. Overall, the impact of the drought option on water has been assessed as negligible.	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** An Environmental Report has been prepared for drought contingency planning for Windermere and includes an assessment of the water quality and ecological impacts of the drought option. The drought option is expected to have negligible impact on lake hydrochemistry and water quality and any effects would be short term, i.e. during summer, when algal production is greatest. Similarly, the magnitude of impact on the River Leven is predicted to be low between April and June when conditions for algal and plant growth are most favourable and negligible at other times of the year. Overall, the impact of the drought option on water has been assessed as negligible, based on negligible impacts to river water quality.	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** An Environmental Assessment Report has been prepared for drought contingency planning for the drought option and included an assessment of impacts on WFD deterioration. The report concluded negligible impacts on the current WFD status, future WFD objectives and supporting element status of all waterbodies.	Negligible adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for Windermere and includes an assessment of geomorphological impacts. Lake drawdown under the drought option is similar to a normal drought situation and changes in geomorphological function of the lake would be negligible. The low flow and the velocity envelope in the River Leven would be very similar to normal drought conditions throughout the year, as the hands-off flow protects the lowest flows. No changes in geomorphological function would therefore be expected and the impact is negligible. The impact on sediment transport in the River Leven would also be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	Medium	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** There would be no land use changes associated with this option.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Small	Moderate	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** The abstraction of water from Windermere is via pumped abstraction. An increase in use of infrastructure will result in an increase in emissions.	Minor adverse	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	Moderate	Long-term	Temporary	Medium	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** The abstraction of water from Windermere is via pumped abstraction and will increase energy consumption and, therefore, greenhouse gas emissions.	Minor adverse	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Medium	High	Long-term	Temporary	Low	High	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Moderate beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** The only known Scheduled Monument on Windermere or the River Leven is Newby Bridge itself and there are no known water level dependent archaeological/cultural heritage features. Changes to hydrodynamics are assessed as negligible, therefore, no implications for any previously undiscovered anaerobic / organic remains are anticipated. Impacts on cultural heritage are therefore considered to be negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Medium	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** Windermere and the River Leven are set within the Lake District National Park. An Environmental Report has been prepared for drought contingency planning for Windermere and includes an assessment of landscape impacts. Under Scenario 1, lake levels would remain within the normal drought envelope and effect on river levels and wetted area are predicted to be negligible therefore landscape impacts are assessed as negligible. Overall, landscape impacts are assessed as negligible.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves modifications to abstraction regime and compensation flow only. **Operation** Key adverse inter-relationships between river flows, water quality and biodiversity. This has been as assessed as a minor adverse inter-relationship.	Minor adverse	Negligible beneficial

Drought Plan Option Name: Eden Valley boreholes

Drought Plan Option Description: Increase the annual licensed limit to enable continuation of the maximum daily abstraction rate:
•increase the 12-month rolling abstraction license limit at Bowscar from 618.26 Ml/yr to 1,227.86 Ml/yr

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Bowscar (part of the Eden Valley Boreholes group). There are no anticipated impacts on the River Eden SAC, River Eden and Tributaries SSSI, River Eden SAC, Wan Fell SSSI, Newton Reigny Moss SSSI, Great Salkeld Shingle Bank Site of Invertebrate Significance, Lazonby Fell SSSI, Cowraik Quarry SSSI and LNR. No impacts on ecological features are predicted. Overall impacts on biodiversity, flora and fauna have been summarised as negligible.	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The environmental assessment considered likely impacts on INNS. No impacts are predicted.	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Long-term	Temporary	High	High	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The drought option would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	None	Moderate beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Bowscar and concluded negligible impacts on recreation.	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Long-term	Temporary	High	High	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The drought option would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as moderate beneficial based on continued supply of drinking water.	None	Moderate beneficial
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.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Increased pumping of water from the boreholes will result in an associated increase in resource use. This impact has been assessed as negligible.	Negligible adverse	None
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.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Small changes to energy use are envisaged due to increased pumping of water from the boreholes. This impact has been assessed as negligible.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Bowscar. The assessment predicted a moderate temporary increase in groundwater drawdown within a radius of 1600 m from source. The report concluded that the reduction in river water levels under the proposed drought option will not be significantly lower than the predicted water level in a drought under the normal abstraction scenario. Similarly, no major changes in average velocity, depth, wetted width or wetted area are predicted. The results of the hydrogeological assessment indicate that the drought option at Bowscar is unlikely to have a measurable impact on flows in the River Eden (due to the large size of the river at this point). Overall, impacts of this drought option on water are summarised as negligible.	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** Due to the negligible flow changes predicted as part of the hydrological assessment the impacts to water quality are considered negligible. Impacts on the Eden Valley and Carlisle Basin Permo-Triassic Sandstone groundwater body are assessed as short term low to medium impacts on groundwater levels within a small radius around the Bowscar source.	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Bowscar. There are six third party groundwater abstractions in the zone of influence of the abstraction at Bowscar. Impacts as a result of drought permit implementation are assessed as uncertain, because the sensitivity of individual abstractions to changes in groundwater levels. Impacts on WFD deterioration were not assessed due to the negligible flow changes predicted as part of the hydrological assessment. No deterioration of the Eden Valley and Carlisle Basin Permo-Triassic Sandstone groundwater body is anticipated. Overall, minor adverse, temporary and short-term impacts are anticipated.	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Bowscar and included an assessment of impacts on fluvial geomorphology, which was concluded to be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Bowscar. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A				None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and Climate	6.1 To reduce air pollutant emissions.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Short term increased pumping of water from the borehole will increase air emissions. This impact has been assessed as negligible adverse.	Negligible adverse	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Minor changes to energy use and therefore CO2 emissions are envisaged due to increased pumping of water from the borehole. This impact has been assessed as negligible.	Negligible adverse	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Moderate beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Bowscar and included an assessment of impacts on archaeology. The report concluded that heritage features identified as occurring within or immediately adjacent to the watercourses within the area of study are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter. No records were found to indicate that anaerobic / organic remains are located adjacent to the watercourses, however, no major changes in wetted width or wetted area were predicted. Overall, the impacts on archaeology and cultural heritage are summarised as negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Bowscar and included an assessment of impacts on landscape and visual amenity, which were concluded to be negligible.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** Key inter-relationships include the impact of riverine flow reduction on biodiversity, geomorphology and landscape. However, as the impact on flow reductions are predicted to be negligible, negligible impacts on other topics are anticipated.	Negligible adverse	Negligible beneficial

Drought Plan Option Name: Eden Valley boreholes

Drought Plan Option Description: Increase the annual licensed limit to enable continuation of the maximum daily abstraction rate:
•increase the 12-month rolling abstraction license limit at Gamblesby from 500.00 Ml/yr to 584.00 Ml/yr.

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought options at Gamblesby (part of the Eden Valley Boreholes group). It was concluded that there would be no measurable impacts on river flows or levels in the River Eden itself (which is located in the study area). here are no anticipated impacts on the River Eden & Tributaries SSSI and SAC , Moor House – Upper Teesdale SAC, North Pennine Moors SAC and SPA, Melmerby to Alstone Road SSSI , North Pennines AONB or other designated sites. No impacts on ecological features including fish, macroinvertebrate and macrophyte communities are anticipated. Overall impacts on biodiversity, flora and fauna have been summarised as negligible.	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The environmental assessment considered likely impacts on INNS. No INNS have been identified in either Glassonby Beck or Raven Beck and so no impacts are predicted.	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Long-term	Temporary	High	High	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The drought option would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as minor beneficial based on continued supply of drinking water.	None	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Gamblesby and concluded negligible impacts on recreation (including angling).	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Long-term	Temporary	High	High	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The drought option would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as minor beneficial based on continued supply of drinking water.	None	Minor beneficial
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.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Increased pumping of water from the boreholes will result in an associated increase in resource use. This impact has been assessed as negligible.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
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.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Small changes to energy use are envisaged due to increased pumping of water from the boreholes. This impact has been assessed as negligible.	Negligible adverse	None
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Gamblesby. Impacts on groundwater drawdown in the Eden Valley and Carlisle Basin Permo-Triassic Sandstone groundwater body are assessed as low magnitude, . The report concluded that the reduction in river water levels in the Raven Beck and Glassonby Beck system under the proposed drought option will not be significantly lower than the predicted water level in a drought under the normal abstraction scenario. Similarly, no major changes in average velocity, depth, wetted width or wetted area are predicted. The results of the hydrogeological assessment indicate that the availability and quality of in-stream habit for these waterbodies will be similar to the baseline condition. As no significant changes in flows are predicted for these waterbodies, geomorphological processes are expected to be unaffected relative to the baseline scenario. Overall, impacts of this drought option on water are summarised as negligible.	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** Due to the negligible flow changes predicted as part of the hydrological assessment the impacts to surface water quality are considered negligible. No impacts on the Eden Valley and Carlisle Basin Permo-Triassic Sandstone groundwater body are anticipated.	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought options at Gamblesby. There are no third party groundwater abstractions in the zone of influence of the abstraction at Gamblesby. The environmental assessment concluded minor adverse impacts on three third party surface water abstractions in the zone of influence of the abstraction at Gamblesby. No deterioration of the Eden Valley and Carlisle Basin Permo-Triassic Sandstone groundwater body is anticipated. Impacts on surface waterbody WFD deterioration were not assessed due to the negligible flow changes predicted as part of the hydrological assessment. Overall, minor adverse, temporary and short-term impacts are anticipated.	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Gamblesby and included an assessment of impacts on fluvial geomorphology, which was concluded to be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought options at Gamblesby. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and Climate	6.1 To reduce air pollutant emissions.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Short term increased pumping of water from the boreholes will increase air emissions. This impact has been assessed as negligible adverse.	Negligible adverse	None
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Minor changes to energy use and therefore CO2 emissions are envisaged due to increased pumping of water from the boreholes. This impact has been assessed as negligible.	Negligible adverse	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Gamblesby and included an assessment of impacts on archaeology. The report concluded that heritage features identified as occurring within or immediately adjacent to the watercourses within the area of study are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter. No records were found to indicate that anaerobic / organic remains are located adjacent to the watercourses, however, no major changes in wetted width or wetted area were predicted. Overall, the impacts on archaeology and cultural heritage are summarised as negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Gamblesby and included an assessment of impacts on landscape and visual amenity, which were concluded to be negligible.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** Key inter-relationships include the impact of riverine flow reduction on biodiversity, geomorphology and landscape. However, as the impact on flow reductions are predicted to be negligible, negligible impacts on other topics are anticipated.	Negligible adverse	Negligible beneficial

Drought Plan Option Name: Eden Valley boreholes - Tarn Wood

Drought Plan Option Description: Increase the annual licensed limit to enable continuation of the maximum daily abstraction rate:

•increase the 12-month rolling abstraction license limit at Tarn Wood from 592.27 Ml/yr to 865.78 Ml/yr.

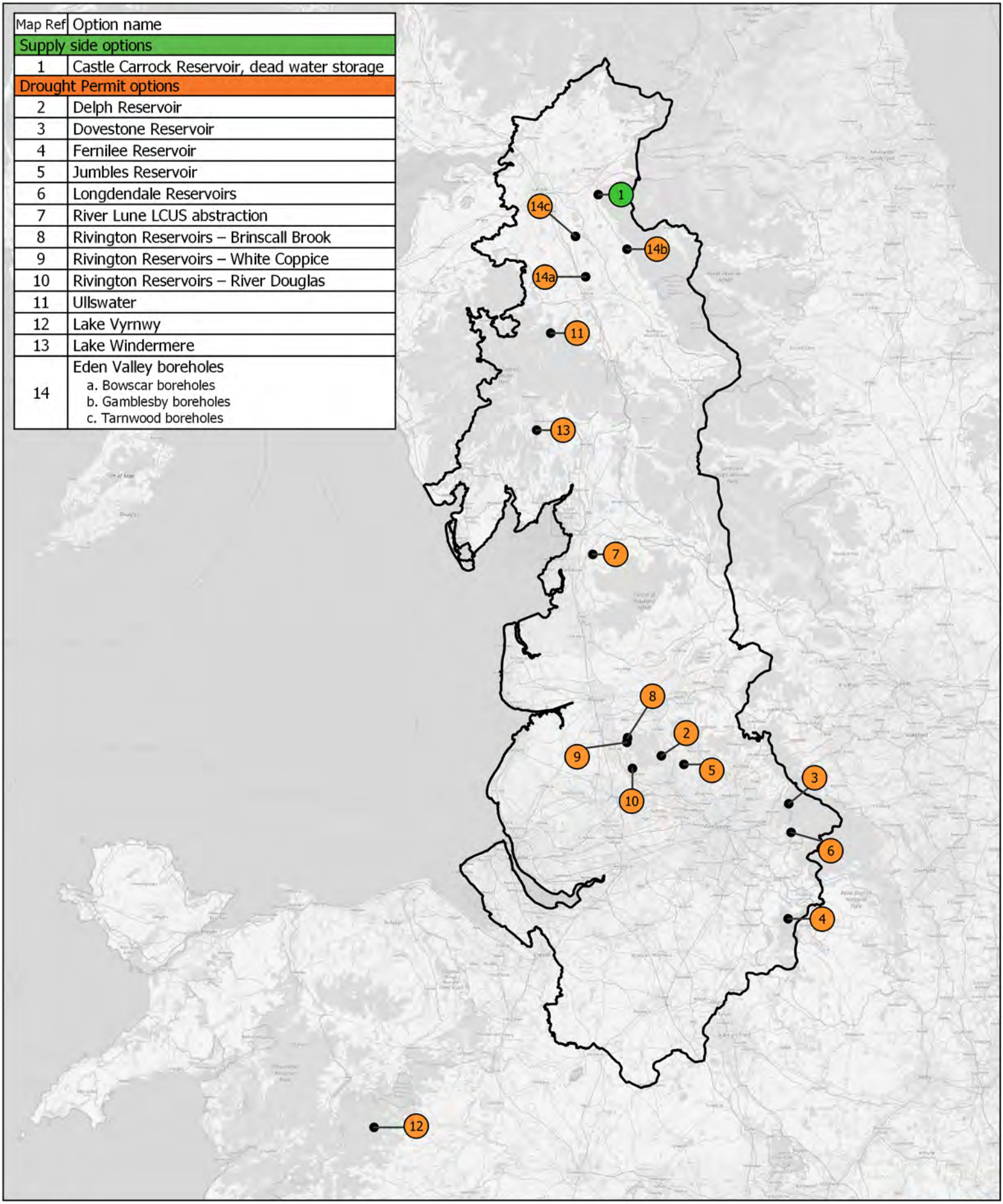
SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**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 conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought options at Tarn Wood (part of the Eden Valley Boreholes group). It was concluded that there would be no measurable impacts on river flows or levels in the River Eden itself (which is located in the study area). here are no anticipated impacts on the River Eden & Tributaries SSSI and SAC , Moor House – Upper Teesdale SAC, North Pennine Moors SAC and SPA, Melmerby to Alstone Road SSSI, North Pennines AONB or other designated sites. No impacts on other ecological features including fish, macroinvertebrate and macrophyte communities are anticipated. Overall impacts on biodiversity, flora and fauna have been summarised as negligible.	Negligible adverse	None
Biodiversity, flora and fauna	1.2 To avoid introducing or spreading INNS.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The environmental assessment considered likely impacts on INNS. No INNS have been identified in either Glassonby Beck or Raven Beck and so no impacts are predicted.	None	None
Population and human health	2.1 To protect and improve health and well-being (including raising awareness of the importance and value of the water environment for health and wellbeing).	Large	Moderate	Long-term	Temporary	High	High	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The drought option would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as minor beneficial based on continued supply of drinking water.	None	Minor beneficial
Population and human health	2.2 To protect and enhance the water environment for other users including recreation, tourism, navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way).	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Tarn Wood and concluded negligible impacts on recreation (including angling).	Negligible adverse	None
Population and human health	2.3 To promote a sustainable economy with provision of access to essential services, including a resilient, high quality, sustainable and affordable supply of water.	Large	Moderate	Long-term	Temporary	High	High	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** The drought option would enable the continued supply of water if dry weather continues. Without these powers in a severe drought, there would be a growing risk of a deficit, placing public water supplies at an unacceptable risk. Overall, the impacts on population and human health have been assessed as minor beneficial based on continued supply of drinking water.	None	Minor beneficial
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.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Increased pumping of water from the boreholes will result in an associated increase in resource use. This impact has been assessed as negligible.	Negligible adverse	None
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.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves modifications to compensation flow only. **Operation** No operational impacts on material assets and resource use are anticipated. Small changes to energy use are envisaged due to increased pumping of water from the boreholes. This impact has been assessed as negligible.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Tarn Wood. Impacts on groundwater drawdown in the Eden Valley and Carlisle Basin Permo-Triassic Sandstone groundwater body are assessed as low magnitude. The report concluded that the reduction in river water levels in the Raven Beck and Glassonby Beck system under the proposed drought option will not be significantly lower than the predicted water level in a drought under the normal abstraction scenario. Similarly, no major changes in average velocity, depth, wetted width or wetted area are predicted. The results of the hydrogeological assessment indicate that the availability and quality of in-stream habit for these waterbodies will be similar to the baseline condition. As no significant changes in flows are predicted for these waterbodies, geomorphological processes are expected to be unaffected relative to the baseline scenario. Overall, impacts of this drought option on water are summarised as negligible.	Negligible adverse	None
Water	4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** Due to the negligible flow changes predicted as part of the hydrological assessment the impacts to surface water quality are considered negligible. No impacts on the Eden Valley and Carlisle Basin Permo-Triassic Sandstone groundwater body are anticipated.	Negligible adverse	None
Water	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions and services that rely on water resources including contributing to the achievement of WFD compliance objectives.	Medium	High	Long-term	Temporary	Low	Medium	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought options at Tarn Wood. There are no third party groundwater abstractions in the zone of influence of the abstraction at Tarn Wood. The environmental assessment concluded minor adverse effects on three third party surface water abstractions in the zone of influence of the abstraction at Tarn Wood. No deterioration of the Eden Valley and Carlisle Basin Permo-Triassic Sandstone groundwater body is anticipated. Impacts on surface waterbody WFD deterioration were not assessed due to the negligible flow changes predicted as part of the hydrological assessment. Overall, minor adverse, temporary and short-term impacts are anticipated.	Minor adverse	None
Water	4.4 To promote measures to enable and sustain long term improvement in water efficiency.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought option at Tarn Wood and included an assessment of impacts on fluvial geomorphology, which was concluded to be negligible.	Negligible adverse	None
Soil, geology and land use	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.	N/A	N/A	N/A	N/A	N/A	N/A	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** There would be no land use changes associated with this option. An Environmental Report has been prepared for drought contingency planning for the drought options at Tarn Wood. No impacts on land, soils and geology are anticipated.	None	None
Soil, geology and land use	5.3 To promote a catchment-wide approach to catchment land management.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	None	None
Air and Climate	6.1 To reduce air pollutant emissions.	Small	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Short term increased pumping of water from the boreholes will increase air emissions. This impact has been assessed as negligible adverse.	Negligible adverse	None

SEA topics and objectives		Assessment of option								
Topic	**Objective**	**Scale of effect: geographical &/ or population affected (small/medium/large)**	**Certainty of effect (low/ moderate/ high)**	**Short-term/ medium-term/ long-term**	**Permanence of effect (permanent/ temporary)**	**Magnitude of effect (low/ medium/ high)**	**Value/ sensitivity of receptor (low/ medium/ high)**	**Potential residual effect on sensitive receptors (assuming good practice construction methods) Commentary**	**Residual adverse effect significance (likely to remain after reasonable mitigation)**	**Residual beneficial effect significance (likely to remain after reasonable mitigation)**
Air and climate	6.2 To reduce energy consumption and greenhouse gas emissions.	Large	Moderate	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** This drought option involves modifications to annual licensed limit only. Minor changes to energy use and therefore CO2 emissions are envisaged due to increased pumping of water from the boreholes. This impact has been assessed as negligible.	Negligible adverse	None
Air and climate	6.3 To consider the need for adaptive measures for climate change.	Small	Moderate	Short-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. Option involves modifications to compensation flow only. **Operation** Drought permits are a key component of United Utilities Drought Plan. The Plan aims to ensure resilience of water supplies to drought, and therefore will have a beneficial impact on adaptation to climate change.	None	Minor beneficial
Archaeology and Cultural Heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Tarn Wood and included an assessment of impacts on archaeology. The report concluded that heritage features identified as occurring within or immediately adjacent to the watercourses within the area of study are unlikely to be directly impacted by any reduction in flow rate, velocity or wetted perimeter. No records were found to indicate that anaerobic / organic remains are located adjacent to the watercourses, however, no major changes in wetted width or wetted area were predicted. Overall, the impacts on archaeology and cultural heritage are summarised as negligible.	Negligible adverse	None
Landscape and Visual Amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.	Small	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** An Environmental Report has been prepared for drought contingency planning for the drought option at Tarn Wood and included an assessment of impacts on landscape and visual amenity, which were concluded to be negligible.	Negligible adverse	None
Inter-relationships	9.1 To acknowledge and understand the potential for inter-relationships between topics and anticipate synergistic effects.	Medium	High	Long-term	Temporary	Low	Low	**Construction** There is no construction phase associated with this drought option. The option involves increase of the annual licensed limit to enable continuation of the maximum daily abstraction rate. **Operation** Key inter-relationships include the impact of riverine flow reduction on biodiversity, geomorphology and landscape. However, as the impact on flow reductions are predicted to be negligible, negligible impacts on other topics are anticipated.	Negligible adverse	Negligible beneficial

Appendix E: Figures

Map Ref	Option name
Supply side options	
1	Castle Carrock Reservoir, dead water storage
Drought Permit options	
2	Delph Reservoir
3	Dovestone Reservoir
4	Fernilee Reservoir
5	Jumbles Reservoir
6	Longdendale Reservoirs
7	River Lune LCUS abstraction
8	Rivington Reservoirs – Brinscall Brook
9	Rivington Reservoirs – White Coppice
10	Rivington Reservoirs – River Douglas
11	Ullswater
12	Lake Vyrnwy
13	Lake Windermere
14	Eden Valley boreholes a. Bowscar boreholes b. Gamblesby boreholes c. Tarnwood boreholes



Legend

- United Utilities Supply Area
- Drought Permit options
- Supply side options

N

Project title: SEA of United Utilities Drought Plan

Figure title: United Utilities Water Supply Area and Drought Options

Date: March 2021

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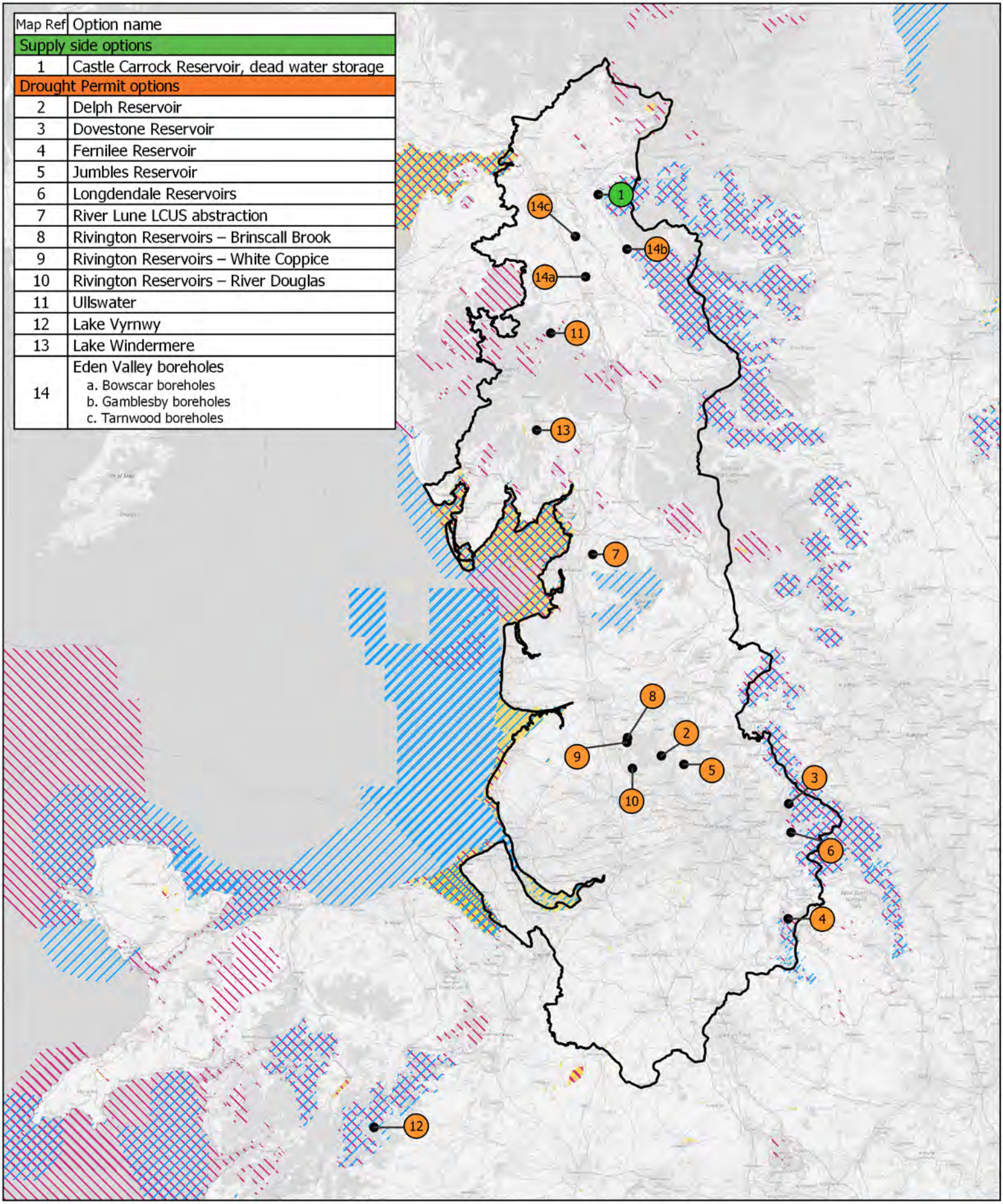
Water for the North West

Figure E1

0 10 20 km



Legend

- United Utilities Supply Area
- Drought Permit options
- Supply side options

Designated Sites

- Special Areas of Conservation
- Special Protection Areas
- Ramsar Sites

N

Project title: SEA of United Utilities Drought Plan

Figure title: European Designated Conservation Sites in North West England and North Wales and Drought Options

Date: March 2021

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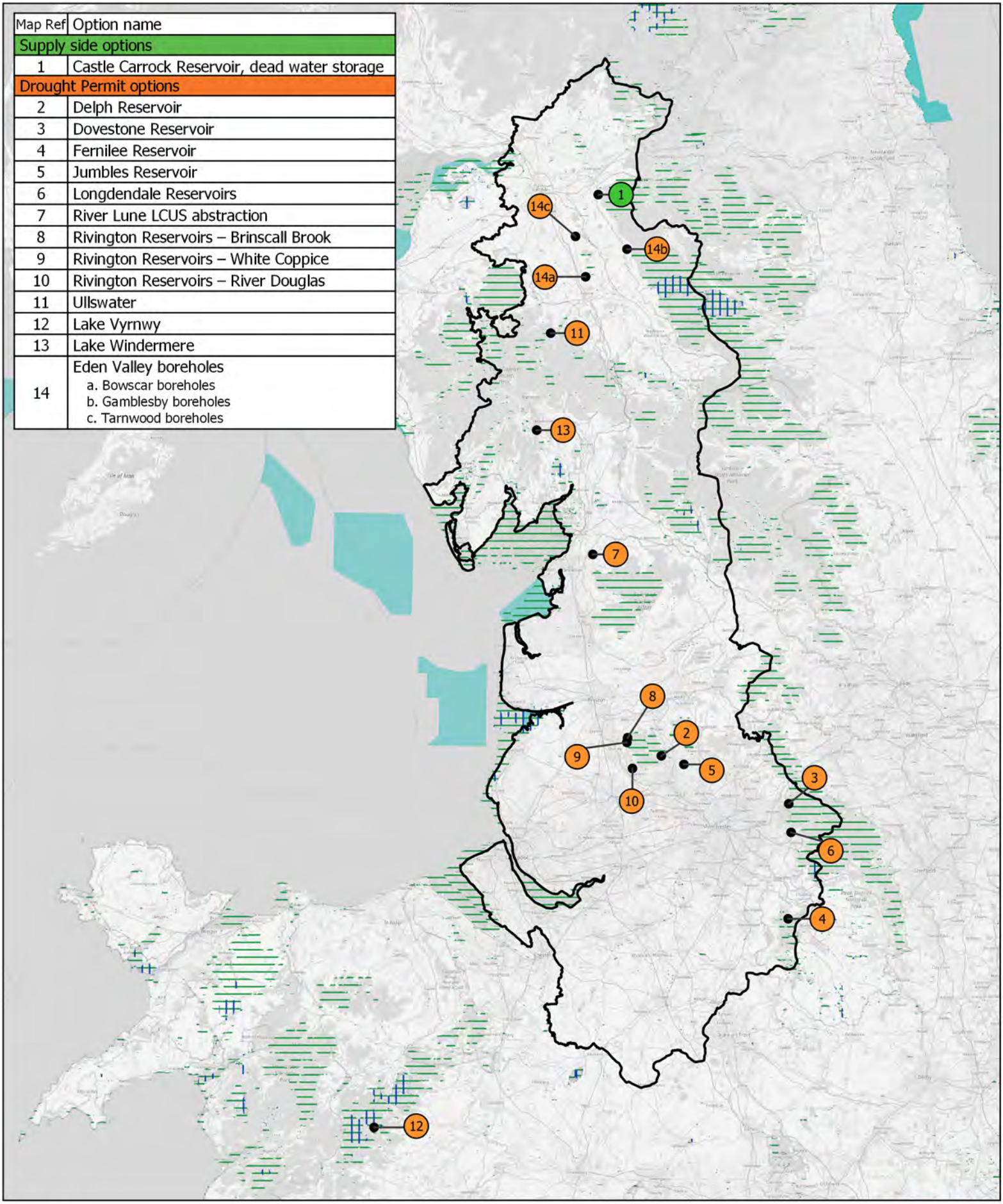
Figure E2

0 10 20 km



Legend

- United Utilities Supply Area
- Drought Permit options
- Supply side options

Designated Sites

- Sites of Special Scientific Interest
- National Nature Reserves
- Marine Conservation Zones

N

Project title: SEA of United Utilities Drought Plan

Figure title: Sites of Special Scientific Interest, National Nature Reserves, Marine Conservation Zones and Drought Options

Date: March 2021

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Figure E3

0 10 20 km

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