South West Water
Bournemouth Water
BRISTOL WATER
Isles of Scilly Water

Draft Drought Plan

Appendix 9: Environmental Option Summaries

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A9.1. Introduction

The following summaries provide an overview of the environmental assessments undertaken to date for the supply and demand options, in support of the South West Water, Bournemouth Water, and Bristol Water (SWBB) Drought Plan 2027. This includes Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) assessment, Invasive Non-native Species (INNS) assessment, and the option-level Strategic Environmental Assessment (SEA), which incorporates wider environmental considerations such as effects on biodiversity, historic environment, soils and resources.

The option summary documents cover the demand options, as well as the supply options within the Colliford, Roadford, Wimbleball, Bristol, Bournemouth and Isles of Scilly Water Resource Zones (WRZs).

Full assessments can be found within the SEA Environmental Report which accompanies the Drought Plan 2027 (Appendix 2). The option-level SEAs can be found within Annex H-N of the SEA Environmental Report, and the Technical Appendices for HRA, WFD and INNS within Annex O-Q.

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SBB Drought Plan 2027

Appendix 9: Drought Option Summaries - Colliford

Project:	SBB Drought Plan 2027 Environmental Assessments		
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Prepared by:	I.N.	**Date:**	24/03/2026
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Subject:	Drought Option Summaries – Colliford WRZ		

1 Colliford Drought Option Summaries

The below summaries provide an overview of the environmental assessments undertaken to date for the options within the Colliford Water Resource Zone (WRZ), in support of the South West Water, Bournemouth Water, and Bristol Water (SBB) Drought Plan 2027. This includes Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) assessment, Invasive Non-native Species (INNS) assessment, and the option-level Strategic Environmental Assessment (SEA), which incorporates wider environmental considerations, such as effects on biodiversity, historic environment, soils, and resources.

Further information including the full assessments can be found within the SEA Environmental Report and Technical Appendices. The option-level SEAs can be found within Annex H-N, and the Technical Appendices for HRA, WFD and INNS within Annex O-Q.

The Colliford options include:

- C-03: River Fowey at Restormel - increase annual abstraction limit
- C-04a: Stannon Lake - increase daily abstraction limit
- C-06: Colliford Reservoir - reduce compensation flow
- C-07a: Park Lake - increase daily abstraction limit
- C-10: Drift Reservoir - reduce compensation flow
- C-11: Hawk's Tor Pit - abstract from new source
- C-17: Stithians Reservoir - reduce compensation flow
- C-30Siblyback Reservoir - reduce compensation flow
- C-37: River Cober at Wendron - increase annual licence limit
- C-40: Colliford Reservoir - reduce fish bank releases

2 Colliford WRZ

2.1 C-03: River Fowey at Restormel - increase annual abstraction limit

2.1.1 SEA Summary Findings

No major negative or positive effects have been identified for option C-03.

A moderate negative effect has been identified for objective 1.3 '*Reduce the spread or presence of INNS'* due to the change in flow resulting in a possible increase of INNS populations in existing areas. A moderate negative effect has also been identified in relation to two water objectives, 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought*'. This relates to a further reduction in river levels downstream in drought conditions, where the river level will already be low. This may reduce water quality and prolong recovery periods, exacerbating impacts from drought.

Minor negative effects have been identified in relation to all other objectives, other than objective 2.3 '*Reduce flood risk'*, 5 '*Protect and enhance the historic environment, including archaeology'*, 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'* and 7 '*Minimise resource use and waste production',* which were either assessed as neutral or minor positive. The minor negative effects are largely attributed to the possible reduction in water quality and quantity downstream of the option, which may result in potential effects on designated sites such as Mid Cornwall Moors SSSI, adverse effects on aquatic habitats and species, increased INNS populations and possible degradation of soils. The increased abstraction and reduction in flows within the river systems may also potentially increase the effects of climate-related droughts and increase the operational energy and associated carbon emissions.

No major positive effects have been identified. A minor positive effect was identified for objective 2.3 *'Reduce flood risk'* due to the expectation that the option will increase abstraction for winter storage, leading to reduced water levels at the time when rainfall is expected to be higher. Therefore, there's the potential for flood risk downstream to be reduced. Objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'* was also identified as having a minor positive effect. This is due to the option providing water supply to water-based tourism businesses in times of drought.

Neutral effects were identified in relation to objectives 5 and 7, due to the option not being within 500m of any Listed Buildings or Scheduled Monuments and any negative impacts of the preservation of buried archaeological deposits are expected to be minimal. Plus, the option does not require any construction works.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
C-03	-	-	--	--	--	+	-	-	-	0	-	+	0

2.1.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Breney Common &Tregoss Moors SAC (approximately 4km east)
	River Camel SAC (approximately 2.2km west)
	Dorset Heathlands Ramsar (approximately 7.2km north-east)
	Falmouth Bay to St Austell Bay SPA (approximately 9.4km north)

2.1.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB510804806400: FOWEY	GB108048001420: Lower River Fowey
GB40802G806600: Looe and Fowey	GB30846225: Colliford Lake

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108048001420	Lower River Fowey	Low / Low	Possible	No	No	2 (adverse impact – risk of deterioration)
GB30846225	Colliford Lake	Low / Low	No	No	No	1 (minor localised impact)

The Level 2 WFD assessment concluded that there is a possible deterioration between status classes, and impediments to Good Ecological Status (GES) or Good Ecological Potential (GEP) for the Lower River Fowey. This is primarily due to changes in flow velocity, and volume as a result of increased abstraction, which may result in adverse effects on the hydrological regime, morphology and water quality downstream of the abstraction site.

2.1.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A moderate risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Increase abstraction volume (relative to baseline) - temporary	• Change in volume of existing transfer between locations already connected • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment	Periodical	Medium	4 = Moderate

The INNS Level 2 assessment identified records for five INNS in the River Fowey, these are: Jenkins' spire shell snail, Shrimp (Crangonyx pseudogracilis), Bivalve (Physa acuta), Himalayan balsam, and

Canadian pondweed. Canadian pondweed was also found in Colliford Reservoir as well as two other INNS; Australian swamp stonecrop and Nuttall's pondweed.

The assessment identified a positive response of Canadian and Nuttall's pondweed in Colliford Reservoir and therefore, there is potential for a population increase. The increase in abstraction from the River Fowey will increase wetted areas and depth in Colliford Reservoir, increasing space for habitat for plant growth as well as there being a higher potential for propagation due to a higher plant density. The overall response of Australian swamp stonecrop was unclear due to the INNS having a negative response to increased wetted areas, however, a positive response to increased depths. Overall a minor localised impact to physiochemical quality elements is anticipated leading to a marginal increase in pollutant load.

Himalayan balsam was identified to respond positively to the increased abstraction from the River Fowey. This is likely due to reduced flows making it easier for plants to grow. The other INNS all had unclear responses to the increased abstraction from the River Fowey. This could be due to a reduction in dilution potential in the river due to increased abstraction, potentially exacerbating any impact of pollutants.

Additionally, due to there being an additional two INNS within the River Fowey, there is an increased chance of INNS/propagule spread within greater transfer volumes.

2.1.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Apply and enforce abstraction controls and hands-off flow (HOF) thresholds set through the Restormel permit to ensure reductions occur only when flows are sufficient.
- Monitor compensation flow and downstream water quantity/quality (dissolved oxygen, temperature, turbidity, nutrients) at agreed stations on the River Fowey, including continuous sondes during operation.
- Implement measures in the Restormel Drought Permit/EAR, including fisheries water bank releases, fish rescue if distress/barriers occur, and incident response protocols.
- Coordinate with the Environment Agency on seasonal abstraction rates to meet River Basin Management Plan (RBMP) targets and maintain conditions for migratory fish.

2.1.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydroecology and hydromorphology surveys and Level 2 WFD modelling for the Lower River Fowey to increase confidence in impact pathways.
- Incorporate outcomes from the WINEP investigation for the Lower River Fowey into option rules and the detailed EAR.
- Maintain the fishcounter, redd mapping and weekly walkovers specified in recent determinations.
- Review recovery post permit.

2.2 C-04a: Stannon Lake - increase daily abstraction limit

2.2.1 SEA Summary Findings

No major negative effects have been identified for C-04a. A moderate negative effect has been identified in relation to objective 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to the potential for the option to reduce water availability in the natural system when levels are already expected to be low in a drought period.

A minor negative effect has been identified for all other objectives, other than 2.3 '*Reduce flood risk'* and 5 *'Protect and enhance the historic environment, including archaeology'*. Minor negative effects are largely attributed to the possible reduction in water quality and quantity downstream of the option, resulting in possible effects on designated sites such as the River Camel SAC, adverse effects on aquatic habitats and species, increased INNS populations, possible degradation of soils, the historic environment, and visual amenity, possible effects on tourism and an increase in carbon emissions.

No major or moderate positive effects have been identified for C-04a. Minor positive effects have been identified for objective 1.3 '*Reduce the spread or presence of INNS'*, relating to a potential decrease in INNS species due to reduced water levels. A minor positive effect has also been identified for objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*. This is due to the option helping to sustain a level of water supply for businesses and agriculture during periods of drought.

Neutral effects were identified for objectives 2.3 and 5 due to the option having minimal impact on flood risk and resulting in a minimal risk to the historic environment.

Option Ref	Biodiversity				Water			Soil	Climate		Historic Env	Population & Human Health			Material Assets
	1.1	1.2	1.3		2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2		7
C-04a	-	-	-	+	-	--	0	-	-	-	0	-	-	+	-

2.2.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. One Habitats Site was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
River Camel SAC (approximately 2.5km west, 4.1km downstream)	Crowdy Marsh SAC (approximately 2.8km northeast)
	Bristol Channel Approaches / Dynesfeydd Mor Hafren SAC (approximately 9.3km west, 37km downstream)
	Tintagel-Marsland-Clovelly Coast SAC (approximately 9.3km northwest)

The HRA assessment identified likely significant effects on the River Camel SAC. Reduced downstream flow on the Stannon Stream and River Camel may result in changes to habitat suitability for qualifying features of the River Camel SAC including otter and fish populations.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the Stannon Stream meet the flow targets and therefore do not adversely affect the qualifying features of the River Camel SAC. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the integrity of the River Camel SAC. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (IDs 08SW100005a and 08SW100018a), and the production of an EAR.

2.2.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB108049006980: Camel (De Lank to Stannon)	• GB30846165: Stannon Lake
• GB40802G800300: North Cornwall	• GB108049007040: Stannon Stream

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108049007040	Stannon Stream	Low / Low	No	No	No	**1 (minor localised impact)**
GB30846165	Stannon Lake	No status classifications for this water body - potential impacts on the lake are considered under the Stannon Stream water body				

The Level 2 WFD assessment concluded a minor negative effect both pre and post-mitigation for both waterbodies. There is no risk of deterioration between status classes, no impediments to GES / GEP, and no compromises to water body objectives.

2.2.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A low risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Increase abstraction volume (relative to baseline) - temporary	• Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility. • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.	Transfers within WFD Operational Catchment	Periodical	Low	2 = Low

The INNS Level 2 assessment found that no INNS were identified in De Lank WTW and Lowermoor WTW, however, one INNS was identified in Stannon Lake; Shrimp (Crangonyx pseudogracilis).

The assessment identified an unclear, possible negative response of this shrimp species in the lake. The decrease in wetted area width will result in a reduction in the area of substrate available for shrimp to inhabit as well as a reduction in the established foraging areas. The loss of water body margins may also reduce the availability of suitable habitat for juvenile shrimp, and a declining population will lead to less dispersal. Therefore, the decrease in wetted areas will create conditions less suitable for shrimp and result in a decrease of the INNS.

As the INNS is recorded in Stannon Lake only, a risk of INNS/propagule spread of these species to De Lank and Lowermoor WTW, however risk is reduced due to treatment at WTW.

2.2.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Adjust abstraction to seasonal flow targets and the requirements of River Camel SAC qualifying features (e.g. Atlantic salmon) to avoid adverse conditions.
- Weekly impact walkovers and fortnightly water-quality checks (DO, temperature, pH, turbidity), plus redd mapping (Nov–Jan); report findings to EA as per permit.
- Maintain pumped supporting flow to Stannon Stream at Q90 in line with 2022 permit condition.

2.2.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydroecology studies and hydrodynamic modelling to evaluate effects on Stannon Stream/River Camel and migratory fish.
- Review baseline ecological data and undertake targeted surveys (habitat suitability, spawning sites, migratory timings).
- Climate-change scenario analysis for mid-/long-term compounded drought effects.
- Integrate previous EAR and determination findings into the EAR update.

2.3 C-06: Colliford Reservoir - reduce compensation flow

2.3.1 SEA Summary Findings

No major negative effects have been identified for C-06, which involves not releasing a compensation flow when making supply releases. A moderate negative effect has been identified for objective 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 1.3 '*Reduce the spread or presence of INNS*' and 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to priority habitats within close proximity of the option being vulnerable to changes in soil moisture and microclimatic conditions, the potential for INNS populations to increase as a result of the option, and the potential reduction in water quality and effects on the River Fowey.

A minor negative effect has been identified for all other objectives, except for 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'*, 5 '*Protect and enhance the historic environment, including archaeology*' and 7 '*Minimise resource use and waste production'*. This is due to possible effects on SSSIs and the water quality in the River Fowey, expected soil destabilisation downstream of the option, the potential for climate-related drought effects being exacerbated by the option as well as a reduction in recreational activities, visual amenity and river-based tourism downstream of the option due to the reduced compensation flow.

No major or moderate positive effects were identified for C-06. Minor positive effects have been identified in relation to objectives 1.2, 2.1 '*Protect and enhance the quality of the water environment and water resources'*, 2.2, 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture.*' The minor positive effects are associated with the numerous priority habitats near the lake that would benefit from a reduced compensation flow, the increased dilution in Colliford Lake improving the water quality, the potential for the option to maintain a level of supply in Colliford Reservoir and may prolong the length of time a level of compensation flow is available downstream, recreational activities in the lake may be positively affected by not releasing the compensation flow from Colliford Reservoir, and the option will support the local economy by sustaining water supplies during drought periods.

Neutral effects were also identified for the remaining objectives due to the option not requiring construction works, having minimal impact of carbon emissions, minimal impact on flood risk, and resulting in a minimal risk to the historic environment.

Option Ref	Biodiversity				Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
C-06	-	--	+	--	-	+	--	+	0	-	0	-	0	-	+	-	+	0

2.3.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Phoenix United Mine and Crow's Nest SAC (approximately 8.3km east)
	River Camel SAC (approximately 7.5km northwest)
	Breney Common and Goss and Tregoss Moors SAC (approximately 4km west)

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Falmouth Bay to St Austell Bay SPA (approximately 9.35km south)

2.3.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30846225: Colliford Lake	• GB108048001420: Lower River Fowey
• GB510804806400: FOWEY	
• GB40802G806600: Looe and Fowey	
• GB108048007640: St Neot River	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108048001420	Lower River Fowey	Low / Low	Possible	No	No	1 (minor localised impact)

The Level 2 WFD assessment concluded a minor negative effect both pre and post-mitigation for both waterbodies. There is a possible deterioration between status classes, no impediments to GES / GEP, and no compromises to water body objectives.

2.3.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified, however a further Level 2 SAI-RAT assessment was still required due to potential habitat changes.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No Transfer	Periodical	None	0 = None

The INNS Level 2 assessment identified records for eight INNS within the lower River Fowey, these are: Himalayan balsam, Rhododendron, Japanese knotweed, Jenkins' spire shell, Crangonyx pseudogracilis (shrimp), Monkey-flower, Canadian pondweed, and Physa acuta (bivalve). Colliford Lake was also found to have Canadian pondweed as well as two other INNS; Nuttall's pondweed and Australian swamp stonecrop.

The assessment identified a possible positive response of Canadian pondweed and Nuttall's pondweed in response to the reduction in compensation flow releases. This is due to the increased wetted areas and

depth allowing more space for rooting and therefore, increasing space/habitat for plant growth. However, the effect of water quality changes should be reviewed following further investigations. Australian swamp stonecrop had an unclear response overall as was found to react positively to increased depths but negatively to increased wetted areas.

In the Lower River Fowey, four INNS were found to have a positive impact to the reduced water levels; Himalayan balsam, Rhododendron, Japanese knotweed, and Monkey-flower. This is potentially due to reduced flows resulting in more stagnant water, encouraging growth of vegetation. The other INNS present within this river had an unclear response to the reduction in compensation flow releases from Colliford Reservoir. The reduction of compensation flow releases into the river could also result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters in upstream water bodies but considering the dilution potential of the rivers that join the Fowey along this reach, impacts to physicochemical quality elements are assumed minor and localised. Additionally minor localised impacts on temperature are anticipated.

2.3.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor downstream river flows, water levels, temperature, dissolved oxygen, turbidity, ammonia, and pH throughout the duration of reduced compensation releases.
- Maintain the Restormel HOF requirement to ensure downstream environmental protection during periods of reduced dilution.
- Implement pollution-incident response protocols and adapt supply-release regimes where ecological thresholds indicate risk to migratory fish or sensitive water-dependent species.
- Coordinate with the Environment Agency using drought-permit monitoring triggers to refine abstraction and release rates based on real-time ecological and hydrodynamic observations.

2.3.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Outcomes from the WINEP AMP8 investigation into the Lower River Fowey must be incorporated into future assessments.
- Additional hydrological and ecological data are required.
- Further investigations into INNS behaviour under altered flow regimes are needed.
- Continued monitoring of fish passage, spawning activity, and macrophyte response is required to determine long-term effects on population resilience.
- Assessment of climate-change–driven flow reductions is required to understand cumulative risk when compensation flows are withheld for extended drought periods.

2.4 C-07a: Park Lake – increase daily abstraction limit

2.4.1 SEA Summary Findings

No major negative effects have been identified for C-07a. A moderate negative effect has been identified for objective 2.2 '*Provide a sustainable water supply in times of drought*' due to potential for the option to reduce water availability in the natural system when levels are already anticipated to be low, as well as the increase in abstraction having the potential to prolong recovery periods post-drought, back to typical baseline conditions.

A minor negative effect has been identified for all other objectives, except for 2.3 '*Reduce flood risk'*, 5 '*Protect and enhance the historic environment, including archaeology*', 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture*' and 7 '*Minimise resource use and waste production'*. The minor negative effects were identified due to factors such as effects on designated sites such as Draynes Wood SSSI, potential increase in INNS populations, potential negative effects on water availability and quality, impacts large areas of peat, minor increase in ongoing operational energy and carbon emissions as well as the potential for the option to exacerbate the effects of climate-related droughts.

No major or moderate positive effects have been identified for C-07a. Minor positive effects have been identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'*. This was due to the potential for water quality at Colliford Reservoir to be improved due to increased dilution, and beneficial effects on recreation and visual amenity at Colliford Reservoir.

Neutral effects were identified for the remaining objectives due to the option not requiring construction works, minimal impact on flood risk, minimal impact on the local economy and resulting in a minimal risk to the historic environment.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
C-07a	-	-	-	-	+	--	0	-	-	-	0	+	0	0

2.4.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Phoenix United Mine and Crow's Nest SAC (approximately 7.1km east)
	River Camel SAC (approximately 7.9km northwest)

2.4.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. No waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB108048007650: Fowey (Upper)	
• GB108048001410: Fowey (Warleggan to St Neot)	
• GB108048001420: Lower River Fowey	

- GB510804806400: FOWEY
- GB30846225: Colliford Lake
- GB108048002320: Seaton
- GB40802G806600: Looe and Fowey

The WFD Level 1 assessment identified no measurable change in the quality of the water environment or the ability for the WFD objectives to be achieved. The reason for this is that the previous EAR determined no risk of WFD deterioration as a result of this option hence it is not required for L2 assessment. In essence, drawdown of the lake level appears to have minimal impact on the lake itself, and this includes impact on flow in the adjacent Trenant Stream.

2.4.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. Low and moderate risk magnitude ratings were identified; meaning a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Increase abstraction volume (relative to baseline) - temporary	• Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility. • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.	Cross WFD Operational Catchment transfer, receiving catchment is receiving to river or reservoir	Periodical	Low	2 = Low
Increase abstraction volume (relative to baseline) - temporary	• Change in volume of existing transfer between locations already connected • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment	Periodical	Medium	4 = Moderate

Increased abstraction at Park Lake Reservoir may lead to downstream changes such as decrease in wetted area, water depth and water quality, potentially facilitating the spread of invasive non-native species. Transfer of water to St Cleer WTW and Colliford Reservoir could also be a risk if the reservoirs already contain INNS.

There is one INNS present within Park Lake; Australian swamp stonecrop. There is an unclear response of this INNS to the increase in abstraction from Park Lake, due to a positive response to the decrease in wetted areas and a negative response to the decrease in depth.

2.4.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor abstraction rates to ensure they remain within licence limits and avoid excessive drawdown at Park Lake.
- Hands off level condition on the current licence will remain in place.
- Undertake weekly flow checks and water-quality monitoring, including temperature, dissolved oxygen, turbidity, and pH, in accordance with Park Lake drought-permit conditions.

- Implement fish-rescue procedures, refugia installation, and aeration where monitoring identifies ecological stress or reduced dissolved oxygen.
- Carry out regular habitat walkovers, redd mapping, bank-stability inspections, and macrophyte/invertebrate surveys, with operational adjustments triggered by adverse findings.

2.4.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Findings from previous EAR and drought determination reports must be reviewed and incorporated into operational planning.
- Further hydrological and ecological survey work is required to confirm abstraction effects on Trenant Stream flows and downstream River Fowey conditions.
- Additional monitoring is required under the WINEP investigation for the Lower River Fowey, including groundwater interactions and seasonal flow resilience.
- Further assessment is needed to determine the response of INNS under altered flow and wetted-area conditions.
- Climate-change scenario analysis is recommended to identify long-term risks associated with compounding drought frequency and reduced recharge rates.

2.5 C-10: Drift Reservoir - reduce compensation flow

2.5.1 SEA Summary Findings

No major negative effects have been identified for C-10. A moderate negative effect has been identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources*' and 2.2 '*Provide a sustainable water supply in times of drought*' due to the potential for the option to reduce water quality and availability in the natural system when levels are already anticipated to be low, as well as the option having the potential to prolong recovery periods post-drought, back to typical baseline conditions.

A minor negative effect has been identified for all other objectives, except for 1.1 '*Protect and enhance designated ecological sites'*, 1.3 'Reduce the spread or presence of INNS', 2.3 *'Reduce flood risk'*, 4.1 *'Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production'*. The minor negative effects were identified in relation to factors such as impacts on priority habitats downstream, potential to destabilise soils on the riverbanks causing subsidence, depleting water levels within the downstream waterbody in the sort-term, possible effects on the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions, as well as adverse effects on recreation, visual amenity and tourism.

No major or moderate positive effects have been identified for C-10. Minor positive effects have been identified for objectives 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*', 2.2, 6.1 *'Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'.* Positive effects were identified due to more water being retained within the reservoir, which may benefit flora and fauna that rely on water levels in the Drift Reservoir and may prolong the length of time a level of compensation flow is available downstream. The option is likely to improve recreation and visual amenity at Drift Reservoir, as well as the potential tourism in this area.

Neutral effects have been identified for the remaining objectives due to the option not requiring construction works, having minimal impact of carbon emissions, not affecting any designated ecological sites, not resulting in the transfer of INNS and having no impact on flood risk.

Option Ref	Biodiversity				Water					Soil	Climate			Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3	4.1	4.2		5	6.1		6.2		7
C-10	0	-	+	0	--	+	--	+	0	-	0	-	+	-	-	+	-	+	0

2.5.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/a	Lands' End and Cape Bank SAC (approximately 7.6km west)
	Lower Bostraze & Leswidden SAC (approximately 5.2km northwest)
	Marazion Marsh SPA (approximately 6.9kn east)

2.5.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30846547: Drift Reservoir	• GB108048002090: Newlyn River
• GB40802G800100: West Cornwall	

Due to programme constraints, the WFD Level 2 assessment has not been undertaken for this option.

2.5.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified, however a further Level 2 SAI-RAT assessment is required due to potential habitat changes.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the INNS SAI-RAT assessment has not been undertaken for this option.

2.5.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor abstraction and downstream water levels to ensure reductions in flow do not exceed environmental protection thresholds.
- Implement targeted river-restoration measures downstream of the point where compensation flows are reduced to support habitat function.
- Conduct routine water-quality monitoring for temperature, dissolved oxygen, turbidity, and ammonia to identify emerging ecological stress.
- Undertake surveys of riparian INNS and implement management actions to prevent spread or dominance during low-flow conditions.
- Maintain operational controls to ensure compensation reductions occur only under drought-permit conditions and within agreed environmental limits.

2.5.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- A Level 2 WFD assessment for the Newlyn River is required but was not completed at the time of assessment.
- Further assessment is required to determine whether reduced flows could affect recharge rates, prolonged drought recovery, or long-term ecological thresholds.

- Additional hydroecological surveys, including habitat mapping and species-specific sensitivity assessments, are needed to verify impacts on water-dependent habitats.
- Ongoing WINEP investigations for this waterbody must be incorporated when refining operational measures and mitigation.
- Additional INNS response modelling is required to understand how reduced flow and altered wetted areas may influence colonisation in both the Newlyn River and Drift Reservoir.

2.6 C-11: Hawk's Tor Pit - abstract from new source

2.6.1 SEA Summary Findings

No major negative effects have been identified for C-11. Moderate negative effects have been identified for objectives 1.1 *'Protect and enhance designated ecological sites*', 1.3 *'Reduce the spread or presence of INNS*' and 2.2 '*Provide a sustainable water supply in times of drought*'. This is due to the potential for the option to impact nearby SSSIs, increase the spread and presence of INNS, and reduce water availability in the natural system when levels are already anticipated to be low.

A minor negative effect has been identified for all other objectives, except for 2.3 '*Reduce flood risk'*, 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'* and 7 '*Minimise resource use and waste production'*. The minor negative effects were in relation to factors such as increased abstraction impacting nearby habitats and species, a reduction in water quality at Hawk's Tor Pit, a possible increase in operational or embodied carbon emissions, a reduction to resilience to climate-related droughts, the potential for increased abstraction to negatively impact historic assets as well as potential adverse effects on the visual amenity of Hawks Tor Pit.

No major or moderate positive effects have been identified for C-11. Minor positive effects have been identified in relation to objectives 1.2 *'Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*', 4.2 '*Increase resilience to climate change risks and hazards'*, 6.1 *'Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'.* These positive effects were due to the potential for the option to improve water quality at Colliford Reservoir, improve the recovery rates of this reservoir as well as improve the visual amenity, recreation and tourism at Colliford Reservoir too.

Neutral effects were identified for the remaining objectives due to the options not requiring construction work, minimal impact on flood risk and minimal impact of soils surrounding the option.

Option Ref	Biodiversity				Water			Soil	Climate			Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1	2.2	2.3	3	4.1	4.2		5	6.1		6.2		7
C-11	--	-	+	--	-	--	0	0	-	-	+	-	-	+	-	+	0

2.6.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/a	Crowdy Marsh SAC (approximately 8.1km north)
	River Camel SAC (approximately 2.4km northwest)

2.6.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. No waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB108048007630: Warleggan River	
• GB510804806400: FOWEY	

- GB108048001420: Lower River Fowey
- GB108048007640: St Neot River
- GB30846225: Colliford Lake
- GB40802G806600: Looe and Fowey

2.6.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A major risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Temporary transfer using new/otherwise unused pathway(s)	• Change in volume and timing of existing transfer between water bodies assumed not already connected. • Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment	Periodical	Medium	5 = Major

The INNS Level 2 assessment identified records for Canadian pondweed, Nuttall's pondweed, and Australian swamp stonecrop in Colliford Reservoir with none being present in Hawks Tor Pit.

Both Canadian and Nuttall's pondweed are expected to respond positively in Colliford Reservoir likely due to an increase in wetted areas and depth creating more habitat, however, Australian swamp stonecrop has an unclear response due to it reacting positively to an increase in water depth but negative response to increase in wetted areas.

There is also potential for the risk of INNS to spread during connectivity between the two reservoirs. Mitigation is required to treat water for INNS to reduce this risk.

2.6.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor abstraction rates and water levels at Hawk's Tor Pit to avoid critically low drawdown that may adversely affect wetland, moorland, or groundwater-dependent habitats.
- Undertake regular ecological surveillance including habitat walkovers, species-presence checks, and fish-rescue procedures where ecological stress is observed.
- Apply invasive species management including screening of intakes and monitoring of INNS within both the source and receiving waterbodies to reduce propagule transfer risk.
- Implement enhanced water-quality monitoring within the receiving system to identify dilution reduction, sediment mobilisation, and temperature effects.
- Maintain operational controls to ensure abstraction only occurs under drought-permit conditions and is adjusted in response to ecological indicators.

2.6.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Further hydroecological assessment to quantify effects on wet heath, mire systems, and other habitats within nearby sensitive sites.
- Additional investigation is required to assess INNS responses, particularly for pondweed species, under changing wetted areas and increased reservoir storage conditions.
- Detailed hydrological modelling is needed to understand drought-recovery times and long-term effects of repeated abstraction on water availability.
- Further assessment is required for potential effects on historic environment features, including prehistoric hut circles and water-sensitive archaeological deposits.
- Climate-change scenario testing is recommended to explore increased drought frequency, groundwater sensitivity, and compounded low-flow risks.

2.7 C-17: Stithians Reservoir - reduce compensation flow

2.7.1 SEA Summary Findings

No major negative effects have been identified for C-17. A moderate negative effect has been identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought*' due to the potential for the option to reduce water quality and availability in the River Kennal when levels are already anticipated to be low, as well as the option having the potential to prolong recovery periods post-drought, back to typical baseline conditions.

A minor negative effect has been identified for all other objectives, except for 1.1 '*Protect and enhance designated ecological sites*', 1.3 '*Reduce the spread or presence of INNS'*, 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production'*. The minor negative effects were in relation to factors such as increased abstraction impacting nearby habitats and species, a possible increase in operational or embodied carbon emissions, a reduction to resilience to climate-related droughts, the potential for increased abstraction to negatively impact the historic environment as well as potential adverse effects on the visual amenity along the River Kennal.

No major or moderate positive effects have been identified for C-11. Minor positive effects have been identified in relation to objectives 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 2.1, 2.2, 4.2 '*Increase resilience to climate change risks and hazards*', 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'*, and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'.* The positive effects are mostly related to retaining water within Stithians Reservoir, benefiting nearby woodlands, water quality and soil health. The option is also likely to prolong the length of time a level of compensation flow is available downstream. Increased water levels in the reservoir are likely to improve the resilience to climate change risks and hazards, as well as sustain recreation and tourism in this area.

Neutral effects were identified for the remaining objectives due to the options not requiring construction works, having minimal impact of carbon emissions, minimal impact on any designated sites, minimal risk relating to INNS and minimal impact on flood risk.

Option Ref	Biodiversity				Water					Soil	Climate			Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3	4.1	4.2		5	6.1		6.2		7
C-17	0	-	+	0	--	+	--	+	0	-	0	-	+	-	-	+	-	+	0

2.7.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Carrine Common SAC (approximately 9.6km northeast)
	Fal & Helford SAC (approximately 8.7km east, 11.8km downstream)
	Falmouth Bay to St Austell Bay SPA (approximately 9.7km east, 11.8km downstream)

2.7.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30846501: Stithians Reservoir	• GB108048001140: Kennal
• GB520804814400: CARRICK ROADS INNER	
• GB40802G800200: South Cornwall	

Due to programme constraints, the WFD Level 2 assessment has not been undertaken for this option.

2.7.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified, however a further Level 2 SAI-RAT assessment is required due to potential habitat changes.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the INNS SAI-RAT assessment has not been undertaken for this option.

2.7.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Apply and enforce HOF thresholds.
- Monitor downstream water levels, dissolved oxygen, temperature, turbidity, and other key water-quality parameters throughout reduced-flow periods.
- Use supply-release adjustments to maintain flow stability when monitoring detects ecological stress or unacceptable deterioration in hydrological conditions.
- Implement invasive non-native species (INNS) monitoring downstream, targeting species known to benefit from reduced flow velocities.

2.7.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Further hydrological modelling is required to quantify the magnitude and temporal extent of downstream low-flow effects specific to Stithians releases.
- Additional baseline ecological data collection (e.g., aquatic habitat condition, migratory-fish timing, riparian habitat sensitivity) is needed to refine impact predictions.
- Climate-change sensitivity testing should be undertaken to assess compounded drought severity and multi-season low-flow risks.

- Outcomes from ongoing WINEP investigations for hydrology, groundwater, and downstream ecological response should be incorporated into later design stages.
- WFD Level 2 assessment.
- Further INNS assessments are required to confirm species-specific responses to reduced flow and altered physicochemical conditions.

2.8 C-30: Siblyback Reservoir - reduce compensation flow

2.8.1 SEA Summary Findings

No major negative effects have been identified for C-30. Moderate negative effects have been identified for objectives 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 1.3 '*Reduce the spread or presence of INNS'*, 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought*'. This is due to the potential for the option to effect water-dependent habitats and species which may already be under stress downstream of the abstraction point, the potential increase in INNS response, reduced water quality downstream of the reservoir, as well as a reduction in water availability in the natural system when levels are already anticipated to be low.

A minor negative effect has been identified for all other objectives, except for 2.3 '*Reduce flood risk'*, 5 '*Protect and enhance the historic environment, including archaeology*' and 7 '*Minimise resource use and waste production'*. The minor negative effects are related to potential impacts on designated sites, subsequential soil destabilisation, reduction of peat functionality due to reduced water levels, decreased resilience to climate-related droughts, as well as potential adverse effects on recreational use, visual amenity and tourism along the River Fowey.

No major or moderate positive effects have been identified for C-30. Minor positive effects have been identified in relation to objectives 1.2, 1.3, 2.1, 2.2, 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 *'Sustaining water supplies for the local economy, including tourism, business and agriculture'*. These effects are related to possible enhancements to habitats and species due to retaining water in the natural environment (within the reservoir), a possible reduction of INNS within Siblyback reservoir, possible improvements to water quality and quantity as well as improving recreational facilities and visual amenity of the reservoir.

Neutral effects were identified for the remaining objectives due to the options not requiring construction works, minimal impact on flood risk, and resulting in a minimal risk to the historic environment.

Option Ref	Biodiversity					Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3		2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
C-30	-	--	+	--	+	--	+	--	+	0	-	-	-	0	-	+	-	+	0

2.8.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Phoenix United Mine & Crow's Nest SAC (approximately 3.1km east)
	River Camel SAC (approximately 6.9km north)
	Breney Common and Goss and Tregoss Moors SAC (approximately 4km west)
	Falmouth Bay to St Austell Bay SPA (approximately 9.3km south)

2.8.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30846262: Siblyback Lake	• GB108048007650: Fowey (Upper)
• GB510804806400: FOWEY	• GB108048001410: Fowey (Warleggan to St Neot)
• GB40802G806600: Looe and Fowey	• GB108048001420: Lower River Fowey

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108048007650	Fowey (Upper)	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)
GB108048001410	Fowey (Warleggan to St Neot)	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)
GB108048001420	**Lower River Fowey**	**Low / Low**	**Possible**	**Possible**	**No**	1 (minor localised impact)

The Level 2 WFD assessment concluded that for Upper Fowey and Fowey (Warleggan to St Neot) there is possible deterioration between status classes and possible impediments to achieving GES / GEP, although no compromises to waterbody objectives were identified. A moderate negative effect was identified both pre and post-mitigation. For the Lower River Fowey, the assessment found no deterioration between status classes, no impediments to achieving GES / GEP, and no compromises to waterbody objectives. A minor positive effect was identified both pre and post-mitigation.

2.8.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified, however a further Level 2 SAI-RAT assessment was required due to potential habitat changes.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

The INNS Level 2 assessment identified records for five INNS within Siblyback Lake which are: Crangonyx pseudogracilis (shrimp), Australian swamp stonecrop, Canadian pondweed, Himalayan balsam, and Nuttall's pondweed.

The Restormel abstraction point had three of the same INNS as Siblyback Lake, which were shrimp, Canadian pondweed, and Himalayan balsam and had an additional three, Jenkins' spire shell snail, Japanese Knotweed, and Physa acuta (bivalve).

The Trekeivesteps abstraction point had the most records of INNS with 10 species being identified. Shrimp, Jenkins' spire shell snail, bivalve, Australian swamp stonecrop, Japanese knotweed, Canadian

pondweed, and Nuttall's pondweed were all identified, as well as three species not present within either of the other locations which are North American signal crayfish, Wautier's Limpet, and Rainbow Trout.

There was a variable response of the INNS in Siblyback Lake with Nuttall's and Canadian pondweed having a positive response into reduced compensation flows due to increased space/habitat for growth from increased wetted areas and water depths. However, Himalayan balsam had the opposite response due to increased wetted areas and depths leading to less space for rooting and a higher submergence time. The other INNS present had variable responses with Australian stonecrop having a positive response to increased depth and a negative response to increased wetted areas. This was the opposite for shrimp which had a positive response to increased wetted areas but a variable response to increased depths. The assessment also did not identify a risk of water quality deterioration.

For both abstraction points, there is an unclear response in relation to reduced compensation flows due to a mix of both positive and negative responses. However, a positive response was identified for Himalayan balsam and Japanese knotweed due to the benefits of reduced flows, wetted areas and depths provided for habitat and reproduction. Australian swamp stonecrop also had a potential positive response. Furthermore, for both abstraction points the assessment identified the cessation of water discharged into this water course via compensation flow releases could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following further investigations. Minor localised impacts on temperature are also anticipated.

2.8.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor abstraction and downstream flow conditions to ensure reductions in compensation releases do not breach environmental protection thresholds.
- Implement river-restoration actions immediately downstream of Siblyback outflows to maintain channel structure, habitat quality, and ecological function.
- Deploy fish-rescue measures, flow augmentation, or aeration where drought-period monitoring identifies stress to fish, macroinvertebrates, or redd sites.
- Undertake INNS surveillance and apply management controls targeting species known to respond positively to low-flow conditions.
- Maintain continuous water-quality monitoring including dissolved oxygen, temperature, ammonia, turbidity, and pH, with operational adjustments made where thresholds are exceeded.

2.8.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Additional ecological surveys are required to quantify the response of sensitive SSSI habitats to multi-season low-flow conditions.
- Further INNS assessments—including physiochemical response modelling—are needed to understand colonisation potential under reduced flow.
- Hydrological modelling is required to predict long-term drought recovery patterns and the effects of repeated compensation-flow suspensions.
- Findings from ongoing WINEP investigations must be incorporated to refine predicted effects and strengthen operational mitigation.
- Additional monitoring of sediment mobility, bank-stability risk, and groundwater–surface water interactions is needed to reduce uncertainty regarding soil and riparian impacts.

2.9 C-37: River Cober at Wendron - increase annual licence limit

2.9.1 SEA Summary Findings

No major negative effects have been identified for C-37. A moderate negative effect has been identified for objective 1.3 '*Reduce the spread or presence of INNS'* and 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to the potential for INNS populations to increase as a result of the option, and the potential reduction in water quality and effects on the River Cober.

A minor negative effect has been identified for all other objectives, except for 2.3 '*Reduce flood risk'*, 5 '*Protect and enhance the historic environment, including archaeology'* and 7 '*Minimise resource use and waste production'*. Minor negative effects relate to effects on designated sites such as Loe Pool SSSI, habitats and species which may depend on a consistent water source, the water quality in the River Cober, expected soil destabilisation downstream of the option, the potential for climate-related drought effects being exacerbated by the option as well as a reduction in recreational activities, visual amenity and river-based tourism downstream of the option due to the reduced compensation flow.

No major or moderate positive effects were identified for C-37. Minor positive effects have been identified in relation to objectives 2.3 and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture*'. This is related to the option being implemented during the second season when rainfall may be higher. Increased abstraction may therefore reduce flood risk. Furthermore, the option will support the local economy by sustaining water supplies during drought periods.

Neutral effects were also identified for the remaining objectives due to the option not requiring construction works and a minimal risk to the historic environment.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health			Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2		7
C-37	-	-	--	-	--	+	-	-	-	0	-	-	+	0

2.9.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Fal & Helford SAC (approximately 5.6km southeast)
	Falmouth Bay to St Austell Bay SPA (approximately 8.7km east)
	The Lizard SAC (approximately 8.8km south)
	Lizard Point SAC (approximately 8.9km south)
	Tregonning Hill SAC (approximately 7.4km west)

2.9.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB40802G800100: West Cornwall	• GB108048001171: Upper River Cober

	• GB108048001172: Lower River Cober • GB30846556: The Loe

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108048001171	Upper River Cober	Low / Low	Possible	Possible	No	1 (minor localised impact)
GB108048001172	Lower River Cober	Low / Low	Possible	Possible	No	1 (minor localised impact)
GB30846556	The Loe	Low / Low	Possible	Possible	No	1 (minor localised impact)

The Level 2 WFD assessment concluded that there is a possible compromise of water body objectives, deterioration between status classes, and impediments to GES / GEP for the Upper River Cober, Lower River Cober, and The Loe. This is primarily due to changes in flow velocity, and volume as a result of increased abstraction from the River Cober, which may result in adverse effects on the hydrological regime, morphology and water quality downstream of the abstraction site.

2.9.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A low risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Increase abstraction volume (relative to baseline) - temporary	• Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility. • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment	Periodical	Low	2 = Low

The INNS Level 2 assessment identified records for four INNS, these are: Crangonyx pseudogracilis (shrimp), Jenkins' spire shell snail, Japanese knotweed, and Himalayan balsam. Both Japanese knotweed and Himalayan balsam had a positive response to the increase in abstraction due to a decrease in flow which allows desirable conditions for plant settlement. The decrease in wetted areas and water depth also helped increase the available habitat for these INNS as well as helping reproduction. Both the shrimp and Jenkins' spire shell snail had an unclear response with a positive response to the decrease in flow velocity but a negative response to a decrease in wetted areas. The decrease in depth had a variable response for INNS.

2.9.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor abstraction rates to ensure operation remains within seasonal thresholds.
- Conduct regular monitoring of water levels, discharge, turbidity, nutrients, dissolved oxygen, and temperature within the River Cober and Loe Pool SSSI.

- Implement INNS control and monitoring programmes targeting species known to benefit from reduced velocity conditions, such as Himalayan balsam and Japanese knotweed.
- Apply adaptive abstraction management during high-risk periods (e.g., following storm events, increased sediment mobilisation, or ecological stress signals).
- Maintain liaison with Natural England and EA to refine operational triggers protecting Loe Pool SSSI water-quality and ecological performance.

2.9.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Further hydrological modelling is required to quantify abstraction effects on Loe Pool SSSI.
- Additional baseline surveys (habitat condition, sediment movement, INNS mapping, fish populations) are required to improve ecological confidence levels.
- More detailed INNS assessments are required to determine species-specific responses to increased winter abstraction and potential propagule transport.
- Climate-change scenario testing should be undertaken to examine reduced winter recharge and increased summer low-flow impacts.
- Outcomes of WINEP investigations relevant to the Cober/Loe Pool system should be reviewed and integrated as new evidence emerges.

2.10 C-40: Colliford Reservoir - reduce fish bank releases

2.10.1 SEA Summary Findings

No major negative effects have been identified for C-40. A moderate negative effect has been identified for option C-40 in relation to objective 1.2 *'Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*' and for the water objectives 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought'* due to a potential reduction in water quality and effects on the River Fowey and St Neot River.

A minor negative effect has been identified for all other objectives, except for 1.1 '*Protect and enhance designated ecological sites*', 2.3 '*Reduce flood risk',* 4.1 '*Reduce embodied and operational carbon emissions*', 5 '*Protect and enhance the historic environment, including archaeology*' and 7 '*Minimise resource use and waste production*'. Minor negative effects relate to a possible increase in INNS populations, adverse effects on soil functionality, a reduction in resilience to climate-related droughts and effects on tourism and visual amenity.

No major or moderate positive effects have been identified. Minor positive effects have been identified in relation to objective 1.2 related to possible enhancements to habitats and species due to retaining water in the natural environment (within the reservoir). Minor positive effects have also been identified across the water objectives (2.1 and 2.2). These are related to possible improvements to water quality and quantity when water is retained within a reservoir.

A minor positive effect was also identified in relation to both population and human health objectives. This is due to the options helping to sustain a level of water supply for businesses and agriculture during periods of drought, and possible enhancements to visual amenity and recreation.

A number of neutral effects were also identified for the remaining objectives due to the options not requiring construction works, having minimal impact of carbon emissions, minimal impact on flood risk, and resulting in a minimal risk to the historic environment.

Option Ref	Biodiversity				Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
C-40	0	--	+	-	--	+	--	+	0	-	0	-	0	-	+	-	+	0

2.10.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Phoenix United Mine and Crow's Nest SAC (approximately 8.3km east)
	River Camel SAC (approximately 7.5km northwest)
	Breney Common and Goss and Tregoss Moors SAC (approximately 4km west)
	Falmouth Bay to St Austell Bay SPA (approximately 9.35km south)

2.10.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30846225: Colliford Lake	• GB108048007640: St Neot River
• GB510804806400: FOWEY	• GB108048001410: Fowey (Warleggan to St Neot)
• GB40802G806600: Looe and Fowey	• GB108048001420: Lower River Fowey

Due to programme constraints, the WFD Level 2 assessment has not been undertaken for this option.

2.10.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified, however a further Level 2 SAI-RAT assessment is required due to potential habitat changes.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Fish bank releases	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the INNS SAI-RAT assessment has not been undertaken for this option.

2.10.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor downstream water levels, flow variability, and water-quality indicators (temperature, dissolved oxygen, turbidity, ammonia, pH) during periods when fish-bank releases may be required.
- Apply adaptive abstraction management to ensure that minimum environmental flow thresholds below the reservoir are maintained where necessary to protect aquatic habitats.
- Implement fish-rescue and temporary habitat-provision measures (e.g., refugia, aeration) where monitoring indicates stress or impeded fish movement.
- Undertake walkover surveys during drought to assess habitat condition, identify barriers to passage, and respond quickly to emerging ecological impacts.
- Maintain liaison with the EA to adjust operational controls if monitoring identifies unacceptable downstream deterioration.

2.10.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Additional monitoring may be required if fish bank releases are requested, to understand ecological outcomes of reduced fish-bank releases, particularly on migratory fish passage and spawning success.

- Climate-change scenario analysis is needed to determine the interaction between reduced water levels and future multi-season drought patterns.
- Continued water-quality and hydrological monitoring is required to validate assumptions of neutral effects on reservoir water quality under altered release patterns.
- Follow-up ecological surveys (macrophytes, macroinvertebrates, fish community composition) should be incorporated into the ongoing drought-response monitoring framework.
- Additional INNS SAI-RAT and WFD Level 2 assessment.

MOTT MACDONALD

SBB Drought Plan 2027

Appendix 9: Drought Option Summaries – Roadford

Project:	SBB Drought Plan 2027 Environmental Assessments		
Our reference:	100125254-MM-RP-SEA-022-B		
Prepared by:	M.T.	**Date:**	24/03/2026
Approved by:	K.M.	**Checked by:**	C.J.
Subject:	Drought Option Summaries – Roadford WRZ		

1 Roadford Drought Option Summaries

The below summaries provide an overview of the environmental assessments undertaken to date for the options within the Roadford Water Resource Zone (WRZ), in support of the South West Water, Bournemouth Water, and Bristol Water (SBB) Drought Plan 2027. This includes Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) assessment, Invasive Non-native Species (INNS) assessment, and the option-level Strategic Environmental Assessment (SEA), which incorporates wider environmental considerations, such as effects on biodiversity, historic environment, soils, and resources.

Further information including the full assessments can be found within the SEA Environmental Report and Technical Appendices. The option-level SEAs can be found within Annex H-N, and the Technical Appendices for HRA, WFD and INNS within Annex O-Q.

The Roadford options include:

- R-07: Slade Reservoir - abstract from new source
- R-11: River Lyd to Roadford Reservoir - extend pumped storage abstraction season to include April and May
- R-20: Avon Reservoir - reduce compensation flow
- R-21: Burrator Reservoir - reduce compensation flow
- R-22: Fernworthy Reservoir - reduce compensation flow
- R-23: Trenchford Reservoir - reduce compensation flow
- R-24: Meldon Reservoir - reduce compensation flow
- R-25: Roadford Reservoir - reduce compensation flow
- R-26: Upper Tamar Lake - reduce compensation flow
- R-45: River Dart & Littlehempston boreholes - aggregate daily and annual licence limits
- R-48: Roadford Reservoir - reduce fish bank releases

2 Roadford WRZ

2.1 R-07: Slade Reservoir - abstract from new source

2.1.1 SEA Summary Findings

No major negative effects have been identified in relation to R-07. A moderate negative effect has been identified for objective 2.2 '*Provide a sustainable water supply in times of drought'*, as the abstraction may result in a potential reduction in water supply within Slade Reservoir and may prolong recovery periods post-drought back to typical baseline conditions.

Minor negative effects have been identified for all other objectives, with the exception of objective 1.1 '*Protect and enhance designated ecological sites*' and 2.3 '*Reduce flood risk'*, which have both been assessed as neutral. The minor negative effects largely relate to the installation of temporary pumping infrastructure and the potential reduction in water levels within Slade reservoir resulting from the abstraction. This may adversely affect nearby habitats and species, reduce water quality within the reservoir, result in soil subsidence, affect the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions, increase carbon emissions and reduce resilience to climate-related droughts and reduce the visual amenity, recreation and potential tourism at Slade reservoir.

No major or moderate positive effects have been identified in relation R-07. Minor positive effects have been identified in relation for objective 4.2 '*Increase resilience to climate change risks and hazards'*, as the option would increase water supplies within the Roadford region during drought periods.

A minor positive effect has also been identified for objective 6.2 '*Sustaining water supplies for the local economy including tourism, business and agriculture*', as increased water availability would benefit local businesses and agricultural activities within the Roadford region.

Option Ref	Biodiversity			Water			Soil	Climate			Historic Env	Population & Human Health			Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2		5	6.1	6.2		7
R-07	0	-	-	-	--	0	-	-	-	+	-	-	-	+	-

2.1.2 HRA Summary Findings

A HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Braunton Burrows SAC (approximately 9.1km north-east)
	Exmoor Heaths SAC (approximately 9.2km south-west)

2.1.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Four waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
	GB610807680004: Bristol Channel Outer South
	GB30843764: Slade Lower Reservoir
	GB30843794: Slade Higher Reservoir

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
	GB40802G801000: River Taw and North Devon Streams

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB610807680004	Bristol Channel Outer South	Low / Low	No	No	No	1 (minor localised impact)
GB30843764	Slade Lower Reservoir	Low / Low	No	No	No	1 (minor localised impact)
GB30843794	Slade Higher Reservoir	Low / Low	No	No	No	0 (negligible impact)
GB40802G801000	River Taw and North Devon Streams	Low / Low	No	No	No	1 (minor localised impact)

The assessment confirmed that four waterbodies required a Level 2 WFD assessment. This assessment identified the maximum impact score was 1 (minor localised impact) both pre and post mitigation. No deterioration is anticipated between status classes, impediments to Good Ecological Status (GES) / Good Ecological Potential (GEP) and the option will not compromise waterbody objectives.

2.1.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A low risk magnitude rating was identified, and a Level 2 SAI-RAT assessment was required to understand how the option may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Temporary transfer using new/otherwise unused pathway(s).	• Change in volume and timing of existing transfer between water bodies assumed already connected. • Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment however is within an isolated catchment	Periodical	Low	2 = Low

The INNS Level 2 assessment identified one INNS recorded as present in Slade Lower Reservoir (Japanese Knotweed). The assessment identified that the reduction in wetted area and average water depth is likely to have a positive response on Japanese Knotweed, due to providing an increase in viable habitat and therefore, more space for rooting.

2.1.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of abstraction during operation to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- A compensation release should be allowed from the reservoir to help support flow in the downstream waterbody.

- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- Review the existing energy supply to seek opportunities for renewable sources.
- Measures to ensure preservation of waterlogged environments, following advice and guidance such as Historic England 2016 ‘Preserving archaeological remains: Decision making for sites under development’.
- Mitigation should be in place to ensure that Slade Reservoir remains open and viable for anglers during construction and operation of the option.

2.1.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Further survey work (including hydroecology, hydromorphological, and aquatic baseline survey and assessment) as well as hydrological modelling is required to improve confidence of the WFD Level 2 Assessment.
- Climate resilience measures opportunities could be considered in the option.

2.2 R-11: River Lyd to Roadford Reservoir - extend pumped storage abstraction season to include April and May

2.2.1 SEA Summary Findings

No major negative effects have been identified in relation to R-11. A moderate negative effect has been identified in relation to objective 1.3 '*Reduce the spread or presence of INNS'*. This is due to changes in flow velocity and average water depth in the River Lyd and Roadford Reservoir, which could potentially result in conditions that could promote a positive response to certain INNS species. A moderate negative effect has also been identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources*'. This is due to the potential changes in flow velocity, average water depth, and water quality within the River Lyd which may affect water quality.

Minor negative effects have been identified for all other objectives, other than 2.3 '*Reduce flood risk'*, 5 '*Protect and enhance the historic environment, including archaeology'* and 7 '*Minimise resource use and waste production*'. The minor negative effects largely relate to changes in flow velocity and water depth in the River Lyd, which may have a negative impact on designated sites, soils, recreation, visual amenity, and tourism. Additionally, the increased abstraction and reduced river flows within the River Lyd could worsen the effects of climate-related droughts and increase operational energy use and associated carbon emissions.

No major or moderate positive effects have been identified in relation to R-11. Minor positive effects have been identified for objective 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principle importance and water-sensitive sites*'. This is due to the potential for the option to support a sustained water levels within Roadford Reservoir during drought periods, which could positively impact habitats and species that rely on these water sources.

Minor positive effects have also identified in relation to objective 1.3, due to the potential negative response of some INNS species resulting from the increased wetted area in Roadford Reservoir. The option was also identified as having potential to result in a positive effect on objective 2.3, as reduced water levels in the River Lyd during April and May may help to reduce flood risk downstream, particularly in areas of flood zone 2 and 3.

Minor positive effects have also identified in relation to objective 4.2 '*Increase resilience to climate change risks and hazards*', as the option may improve resilience to drought by reserving more water in Roadford Reservoir. Both population and human health objectives 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity*' and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'* also had minor positive effects identified. These positive effects were due to the option helping to sustain water supplies during drought which will benefit visual amenity and recreation, and support local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism in summer months.

Neutral effects have been identified in relation to objectives 5 and 7. This is due to the option not requiring any new infrastructure or construction.

Option Ref	Biodiversity					Water			Soil	Climate			Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3		2.1	2.2	2.3	3	4.1	4.2		5	6.1		6.2		7
R-11	-	-	+	--	+	--	-	+	-	-	-	+	0	-	+	-	+	0

2.2.2 HRA Summary Findings

A HRA Test of Likely Significance screening was conducted for the option. Two Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 12.8km east, 15km upstream)	Tamar Estuaries Complex SPA (approximately 19.4km south, 39.5km downstream)
Plymouth Sound & Estuaries SAC (approximately 14.3km south, 27.7km downstream)	

Following the HRA screening, potential adverse effects on Dartmoor SAC and the Plymouth Sound & Estuaries SAC were identified. The HRA AA identified that reduced downstream flow on the River Lyd and River Tamar may result in changes to habitat suitability for migratory Atlantic salmon.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Lyd and Tamar meet the flow targets and therefore do not adversely affect Atlantic salmon associated with the above designated sites. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the integrity of Dartmoor SAC or the Plymouth Sound & Estuaries SAC. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08SW100019g) and the production of an EAR.

2.2.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB108047007910: Tamar (River Lyd to River Inny)	GB108047007731: Lower River Lyd
GB40802G806700: Tamar	GB30847000: Roadford Lake

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108047007731	Lower River Lyd	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration
GB30847000	Roadford Lake	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration

The assessment confirmed that two waterbodies required a Level 2 assessment. This assessment identified the maximum impact score was 2 (adverse impact) both pre and post mitigation. There is a possible compromise of waterbody objectives, and a possible deterioration between status classes, and impediments to GES / GEP for both the Lower River Lyd and Roadford Lake. Both waterbodies were also identified as not assisting the attainment of waterbody objectives.

2.2.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. This identified a moderate risk associated with the transfer of INNS, therefore a Level 2 SAI-RAT assessment was required to understand how the option may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Extend abstraction season	• Change in volume and timing of existing transfer between locations already connected	Transfer within WFD Operational Catchment	Periodical	Medium	4 = Moderate

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
	Assumes any transferred INNS would be treated/removed at water treatment facility. • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.				

The INNS Level 2 assessment identified five INNS recorded as present within the River Lyd (Jenkins' spire shell, Crangonyx pseudogracilis, Japanese knotweed, Giant hogweed, and Himalayan balsam), and three INNS recorded within Roadford Reservoir (Austrailian swamp stonecrop, Nuttall's pondweed, and Jenkins' spire shell).

For the River Lyd, the assessment identified a positive response of Crangonyx pseudogracilis, Japanese knotweed, and Jenkins' spire shell, due to the decrease in average flow velocity providing additional habitat for these species. The decrease in wetted area is also likely to benefit Japanese knotweed, whereas for Crangonyx pseudogracilis and Jenkins' spire shell the decrease in aquatic habitat is likely to result in a negative response. The decrease in average depth is expected to result in a variable effect on Crangonyx pseudogracilis and Jenkins' spire shell, whereas the decrease in depth could increase in riparian growth of Japanese knotweed.

For Roadford Reservoir, the assessment identified a potential increase in Nuttall's pondweed and Jenkins' spire shell, due to an increase wetted areas and water depth potentially providing additional habitat for these species. A negative response was identified for Australian swamp stonecrop due to an increase in wetted area decreasing space for growth. Australian swamp stonecrop did however have a positive response to an increase in water depth by allowing more space for growth in the water column.

2.2.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of abstraction during operation to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational abstraction must consider seasonal flows and will be restricted to periods when the flow within the River Lyd is sufficient to support this. A hands-off flow (HOF) above which no additional reductions may occur will be set, in order to protect low flows during drought periods.
- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- River restoration measures (bank/toe protection, 2 step channels, berms, gravel riffles, coir rolls) could be implemented in advance of or as part of a recovery effort following drought and the combined impact of a drought event and this option. These measures may assist in establishing a more natural hydrological regime, improving the morphological diversity of the river in low flow conditions, reducing the impacts of a loss in flow due to the options operation. Measures would be most effectively implemented immediately downstream of where the loss in flow originates.
- Review the existing energy supply to seek opportunities for renewable sources.

2.2.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the River Lyd and Atlantic salmon using this watercourse (and other affected watercourses) to migrate to spawning grounds in the SAC.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify specific migratory periods for these rivers and the proportion of fish migrating at different times of the year.
- A climate change scenario analysis is recommended to account for mid-and long-term effects which could be compounded through more frequent and intense droughts in the future.
- There is a previous EAR associated with this option. Findings of this should be considered through development of this option. The River Lyd EAR monitoring includes; Baseline walkover pre-implementation; weekly flow measurements; fortnightly water-quality checks (DO, temp, pH, turbidity); report data to EA within 1 week of each survey and final post-abstraction report.

2.3 R-20: Avon Reservoir - reduce compensation flow

2.3.1 SEA Summary Findings

No major negative effects have been identified in relation to R-20. A moderate negative effect has been identified for objective 1.1 '*Protect and enhance designated ecological sites'*. This is due to the option resulting in reduced compensation flows to the River Avon, which may have adverse effects on Dartmoor SAC. The SAC is hydrologically connected to the option and is designated for Atlantic salmon and otter, which may be sensitive to reduced river flows. A moderate negative effect has also been identified for objective 2.2 '*Provide a sustainable water supply in times of drought'*. The reduction in compensation flow from Avon Reservoir to the River Avon would reduce water levels during drought conditions and may prolong the recovery of flows to typical baseline conditions following drought events.

Minor negative effects have been identified for all other objectives, other than 1.3 '*Reduce the spread or presence of INNS'*, 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'*, and 7 '*Minimise resource use and waste production'*. These minor negative effects largely relate to reduced water availability in the River Avon, which could lead to disturbance of habitats, reduced water quality, potential soil destabilisation, disturbance to buried archaeology, and adverse impacts on visual amenity. These impacts could also lead to negative effects on tourism and recreational activities.

No major or moderate positive effects have been identified in relation to R-20. Minor positive effects have been identified for objective 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*. This is due to the potential for the option to support higher water levels within the Avon Reservoir during drought conditions, which may benefit habitats and species that rely on this water source. Minor positive effects have also identified for objectives 2.1 and 2.2, as retaining more water in the Avon Reservoir may improve water quality due to dilution effects, and may prolong the length of time a level of compensation flow is available during a drought.

In addition, minor positive effects have been identified for objectives 3 and 4.2 due to the potential to support peatland and increase resilience to drought by reserving more water in the reservoir. Minor positive effects have also been identified for the population and human health objectives 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity*' and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*. These positive effects are due to the option helping to sustain water supplies during drought periods, supporting visual amenity and recreation, and supporting local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have also been identified for the remaining objectives. This is because the option is expected to have minimal impact on INNS risk, is not expected to increase flood risk, and does not require any new infrastructure or construction activities.

Option Ref	Biodiversity				Water					Soil		Climate			Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3		4.1	4.2		5	6.1		6.2		7
R-20	--	-	+	0	-	+	--	+	0	-	+	0	-	+	-	-	+	-	+	0

2.3.2 HRA Summary Findings

A HRA Test of Likely Significance screening was conducted for the option. One Habitats Site was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 1.5km west)	South Dartmoor Woods SAC (approximately 5km north-east)

Potential for Significant Effects (AA required)	No Likely Significant Effects
	South Hams SAC (approximately 6km east)

Due to programme constraints, the HRA AA has not been undertaken for this option.

2.3.3 WFD Summary Findings

A Level 1 assessment was carried out for the option. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB30846291: Avon Dam Reservoir	GB108046004941: Upper Avon
GB510804606000: AVON	GB108046004940: Avon – Upper
GB40802G800700: Teign, Avon, Dart and Erme	GB108046004900: Avon - Lower

Due to programme constraints, the WFD Level 2 Assessment has not been undertaken for this option.

2.3.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment is required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the Level 2 SAI-RAT assessment has not been undertaken for this option.

2.3.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor compensation flow during operation to avoid and mitigate negative effects on water resources.
- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- Implement river restoration measures immediately downstream of where the loss in flow originates.
- Mitigation should be in place to ensure that the reservoir remains open and viable for anglers during operation of the option.

2.3.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- HRA Appropriate Assessment.

- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option.
- INNS SAI-RAT assessment.
- WFD Level 2 assessment.

2.4 R-21: Burrator Reservoir - reduce compensation flow

2.4.1 SEA Summary Findings

No major negative effects have been identified in relation to R-21. A moderate negative effect has been identified for biodiversity objective 1.1 '*Protect and enhance designated ecological sites'*. This is due to the option resulting in a reduced compensation flow from Burrator Reservoir to the River Meavy, which may have adverse effects on designated sites that are hydrologically linked to the option. These include Dartmoor SAC and Shaugh Prior Woods SSSI, both of which have qualifying features that may be dependent on river water levels and water quality.

Moderate negative effects have also been identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources*' and 2.2 '*Provide a sustainable water supply in times of drought'*. These effects arise from the potential reduction in water quantity and quality within the River Meavy resulting from reduced compensation flows.

Minor negative effects have been identified for all other objectives, other than 1.3 '*Reduce the spread or presence of INNS'*, 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'*, and 7 '*Minimise resource use and waste production'*. These minor negative effects largely relate to reduced water availability in the River Meavy, which could lead to disturbance of habitats, reduced water quality, potential soil destabilisation, disturbance to buried archaeology, and adverse impacts on visual amenity. These impacts could also lead to negative effects on tourism and recreational activities.

No major or moderate positive effects have been identified in relation to R-21. Minor positive effects have been identified for objective 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'.* This is due to the potential for the option to support higher water levels within the Burrator Reservoir during drought conditions, which may benefit habitats and species that rely on this water source. Minor positive effects have also identified for objectives 2.1 and 2.2, as retaining more water in the Burrator Reservoir may improve water quality due to dilution effects.

In addition, minor positive effects have been identified for objectives 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'* and 4.2 '*Increase resilience to climate change risks and hazards'* due to the potential to support peatland and increase resilience to drought by reserving more water in reservoirs. Minor positive effects have also been identified for the population and human health objectives 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*. These positive effects are due to the option helping to sustain water supplies during drought periods, supporting visual amenity and recreation, and supporting local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have also been identified for the remaining objectives. This is because the option is expected to have minimal impact on INNS risk, is not expected to increase flood risk, and does not require any new infrastructure or construction activities.

Option Ref	Biodiversity				Water						Soil		Climate			Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3		3		4.1	4.2		5	6.1		6.2		7
R-21	--	-	+	0	--	+	--	+	0		-	+	0	-	+	-	-	+	-	+	0

2.4.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. One Habitats Site was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 3.5km east)	Plymouth Sound & Estuaries SAC (approximately 8.2km southwest, 23km downstream)
	South Dartmoor Woods SAC (approximately 3.3km north, 3.5km south, 6.7km downstream)
	Tamar Estuaries Complex SPA (approximately 8.2km southwest, 26km downstream)

Due to programme constraints, the HRA AA has not been undertaken for this option.

2.4.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30846279: Burrator Reservoir	• GB108047003660: Meavy
• GB520804714300: PLYMOUTH TAMAR	• GB108047004040: Lower River Plym
• GB40802G806700: Tamar	

Due to programme constraints, the WFD Level 2 Assessment has not been undertaken for this option.

2.4.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment is required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the Level 2 SAI-RAT assessment has not been undertaken for this option.

2.4.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of compensation flow during operation to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- Implement river restoration measures immediately downstream of where the loss in flow originates.
- Mitigation should be in place to ensure that Burrator Reservoir remains open and viable for anglers during construction and operation of the option.

2.4.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- HRA Appropriate Assessment.
- A WINEP investigation associated with this waterbody has been undertaken. Findings of this should be considered through development of this option.
- INNS Level 2 SAI-RAT assessment.
- WFD Level 2 assessment.

2.5 R-22: Fernworthy Reservoir - reduce compensation flow

2.5.1 SEA Summary Findings

No major negative effects have been identified in relation to R-22. A moderate negative effect has been identified for biodiversity objective 1.1 '*Protect and enhance designated ecological sites'*. This is due to the option resulting in a reduced compensation flow from Fernworthy Reservoir to the South Teign River, which may have adverse effects on designated sites that are hydrologically linked to the option. These include Dartmoor SAC, Whiddon Deer Park SSSI, East Dartmoor SSSI and North Dartmoor SSSI, all of which have qualifying features that may be dependent on river water levels and water quality.

Moderate negative effects have also been identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources*' and 2.2 '*Provide a sustainable water supply in times of drought'*. These effects arise from the potential reduction in water quantity and quality within the South Teign River, resulting from a reduced compensation flow.

Minor negative effects have been identified for all other objectives, other than 1.3 '*Reduce the spread or presence of INNS'*, 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'*, and 7 '*Minimise resource use and waste production'*. These minor negative effects largely relate to reduced water availability in the South Teign River, which could lead to disturbance of habitats, reduced water quality, potential soil destabilisation, disturbance to buried archaeology, and adverse impacts on visual amenity. These impacts could also lead to negative effects on tourism and recreational activities.

Minor positive effects have also been identified for objective 1.1, as retaining water in Fernworthy Reservoir may positively affect Fernworthy Reservoir CWS. Minor positive effects have also been identified for objective 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'.* This is due to the potential for the option to support higher water levels within the Fernworthy Reservoir during drought conditions, which may benefit habitats and species that rely on these water sources. Minor positive effects have also identified for objectives 2.1 and 2.2, as retaining more water in Fernworthy Reservoir may improve water availability and quality at this location due to dilution effects.

In addition, minor positive effects have been identified for objectives 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'* and 4.2 '*Increase resilience to climate change risks and hazards',* due to the potential to support peatland and increase resilience to drought by reserving more water in reservoirs. Minor positive effects have also been identified for the population and human health objectives 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity*' and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'.* These positive effects are due to the option helping to sustain water supplies during drought periods, supporting visual amenity and recreation, and supporting local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have also been identified for the remaining objectives. This is because the option is expected to have minimal impact on INNS risk, is not expected to increase flood risk, and does not require any new infrastructure or construction activities.

Option Ref	Biodiversity					Water					Soil		Climate			Historic Env	Population & Human Health				Material Assets
	1.1		1.2		1.3	2.1		2.2		2.3	3		4.1	4.2		5	6.1		6.2		7
R-22	--	+	-	+	0	--	+	--	+	0	-	+	0	-	+	-	-	+	-	+	0

2.5.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. One Habitats Site was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 250m south, 250m upstream)	South Dartmoor Woods SAC (9km southeast, 18km downstream)

Due to programme constraints, the HRA AA has not been undertaken for this option.

2.5.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30846123: Fernworthy Reservoir	• GB108046008510: South Teign River
• GB510804605800: TEIGN	• GB108046008550: Teign (Upper)
• GB40802G800700: Teign, Avon, Dart and Erme	• GB108046008540: Teign (Lower)

Due to programme constraints, the WFD Level 2 Assessment has not been undertaken for this option.

2.5.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment is required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the Level 2 SAI-RAT assessment has not been undertaken for this option.

2.5.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of compensation flows during operation to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- Implement river restoration measures immediately downstream of where the loss in flow originates.
- Mitigation should be in place to ensure that Fernworthy Reservoir remains open and viable for anglers during construction and operation of the option.

2.5.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- HRA Appropriate Assessment.
- A WINEP investigation associated with this waterbody has been completed. Findings of this should be considered through development of this option.
- INNS Level 2 SAI-RAT assessment.
- WFD Level 2 assessment.

2.6 R-23: Trenchford Reservoir - reduce compensation flow

2.6.1 SEA Summary Findings

No major negative effects have been identified in relation to R-23. Moderate negative effects have been identified for objective 1.1 '*Protect and enhance designated ecological sites',* 2.1 '*Protect and enhance the quality of the water environment and water resources*', 2.2 'Provide a sustainable water supply in times of drought', and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'*. This is due to the option resulting in a reduced compensation flow from Trenchford Reservoir, which may have adverse effects on designated sites that are hydrologically linked to the option including Dartmoor SAC. Reduced flow may also adversely affect water quality downstream of the reservoir, and prolong recovery periods post-drought back to typical baseline conditions. The option also has the potential to negatively impact recreational opportunities on the lake downstream of the reduced compensation flow.

Minor negative effects have been identified for all other objectives, other than 1.3 '*Reduce the spread or presence of INNS'*, 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'*, and 7 '*Minimise resource use and waste production'*. These minor negative effects largely relate to reduced water availability downstream of the reduced compensation flow, which could lead to disturbance of habitats, reduced water quality, potential soil destabilisation, disturbance to buried archaeology, and adverse impacts on visual amenity. These impacts could also lead to negative effects on tourism and recreational activities.

No major or moderate positive effects were identified for any of the options. Minor positive effects have been identified for objective 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'.* This is due to the potential for the option to support higher water levels within the Trenchford Reservoir during drought conditions, which may benefit habitats and species that rely on these water sources. Minor positive effects have also identified for objectives 2.1 and 2.2, as retaining more water in Trenchford Reservoir may improve water availability and quality due to dilution effects.

In addition, minor positive effects have been identified for objective 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance',* due to the potential to support peatland habitat around the reservoir. Minor positive effects have also been identified for the population and human health objectives 6.1 and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'.* These positive effects are due to the option helping to sustain water supplies during drought periods, supporting visual amenity and recreation, and supporting local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have also been identified for the remaining objectives. This is because the option is expected to have minimal impact on INNS risk, is not expected to increase flood risk, and does not require any new infrastructure or construction activities, meaning the option is not expected to increase operational or embodied carbon.

Option Ref	Biodiversity				Water					Soil		Climate		Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3		4.1	4.2	5	6.1		6.2		7
R-23	--	-	+	0	--	+	--	+	0	-	+	0	-	-	--	+	-	+	0

2.6.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. One Habitats Site was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 8.9km west)	South Hams SAC (approximately 6.7km southeast)
	South Dartmoor Woods SAC (approximately 3.25km southeast)

Due to programme constraints, the HRA AA has not been undertaken for this option.

2.6.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30846161: Trenchford Reservoir	• GB108046008500: Beadon Brook
• GB510804605800: TEIGN	• GB108046008540: Teign (Lower)
• GB40802G800700: Teign, Avon, Dart and Erme	

Due to programme constraints, the WFD Level 2 Assessment has not been undertaken for this option.

2.6.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment is required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the Level 2 SAI-RAT assessment has not been undertaken for this option.

2.6.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Apply and enforce abstraction limits and compensation-flow reductions only during periods when upstream flows are sufficient to support downstream ecological and hydrological needs.
- Regularly monitor downstream water quantity and quality in Beadon Brook to identify any emerging ecological stress, including reduced dissolved Oxygen, elevated temperatures, or impaired habitat function.
- Monitor reservoir water levels and quality to ensure beneficial effects within Trenchford Reservoir do not lead to adverse trade-offs elsewhere in the system.
- Implement best-practice environmental management during any operational activities, including measures to protect riparian habitats adjacent to the reservoir and Beadon Brook.
- Incorporate findings from the ongoing WINEP investigation for the Trenchford/Teign system to refine operational constraints and ecological safeguards.

2.6.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- A WFD Level 2 assessment for Beadon Brook and the Lower Teign to provide increased confidence regarding potential impacts on waterbody status and recovery.
- Further INNS SAI-RAT assessment.
- An HRA Appropriate Assessment to confirm the absence of adverse effects on the integrity of the Dartmoor SAC.
- Further hydroecological and hydrological modelling is needed to understand low-flow sensitivity, habitat suitability, and the risk of adverse effects on migratory fish species linked to Dartmoor SAC.
- Additional baseline data for downstream geomorphology and soil stability should be collected to better assess potential subsidence or riverbank erosion associated with reduced flows.
- Further assessment of climate change-related drought frequency and intensity is required to understand how compounded low-flow conditions may interact with compensation flow reductions.
- Additional baseline archaeological and paleoenvironmental assessment may be needed to determine the vulnerability of any water-dependent buried deposits.

2.7 R-24: Meldon Reservoir - reduce compensation flow

2.7.1 SEA Summary Findings

No major negative effects have been identified in relation to R-24. Moderate negative effects have been identified for objective 1.1 '*Protect and enhance designated ecological sites',* 1.2 *'Protect and enhance ecology biodiversity, including habitats and species of principal importance and water-sensitivity'*, 2.1 '*Protect and enhance the quality of the water environment and water resources*', and 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to the option resulting in a reduced compensation flow from Meldon Reservoir, which may have adverse effects on designated sites that are hydrologically linked to the option, such as Dartmoor SAC, as well as exacerbate the vulnerability of principal species, adversely affect water quality within West Okement River, and prolong recovery periods post-drought back to typical baseline conditions.

Minor negative effects have been identified for all other objectives, other than 1.3 '*Reduce the spread or presence of INNS'*, 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'*, and 7 '*Minimise resource use and waste production'*. These minor negative effects largely relate to reduced water availability downstream of the reservoir, which could lead to disturbance of habitats and species, reduced water quality, potential soil destabilisation, disturbance to buried archaeology, and adverse impacts on visual amenity, tourism, and agriculture. These minor negative effects largely relate to reduced water availability downstream of the reservoir, which could lead to disturbance of habitats and species, reduced water quality, potential soil destabilisation, disturbance to buried archaeology, and adverse impacts on visual amenity, tourism, and agriculture which may rely on the West Okemont River.

No major or moderate positive effects were identified for any of the options. Minor positive effects have been identified for objective 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'.* This is due to the potential for the option to support higher water levels within the Roadford Reservoir during drought conditions, which may benefit habitats and species that rely on these water sources.

Minor positive effects have also identified for objectives 2.1 and 2.2, as retaining more water in Roadford Reservoir may would retain a level of supply and may prolong the length of time a level of compensation flow is available downstream. Minor positive effects have also identified for objectives 2.1 and 2.2, as retaining more water in Roadford Reservoir may would retain a level of supply within the reservoir, which may improve water quality within this waterbody, and may prolong the length of time a level of compensation flow is available downstream.

Minor positive effects have also been identified for the population and human health objectives 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'.* These positive effects are due to the option helping to sustain water supplies during drought periods, supporting visual amenity and recreation at Meldon Reservoir, and supporting local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have also been identified for the remaining objectives. This is because the option is not expected to increase flood risk, and does not require any new infrastructure or construction activities, meaning the option is not expected to increase operational or embodied carbon.

Option Ref	Biodiversity				Water					Soil		Climate		Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3		4.1	4.2	5	6.1		6.2		7
R-24	--	--	+	0	--	+	--	+	0	-	+	0	-	-	-	+	-	+	0

2.7.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. One Habitats Site was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (within options boundary)	

Due to programme constraints, the HRA AA has not been undertaken for this option.

2.7.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Four waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30845945: Meldon Reservoir	• GB108050008080: West Okement
• GB540805015500: TAW / TORRIDGE	• GB108050008110: Middle River Okement
• GB40802G800600: Torridge and Hartland Streams	• GB108050008130: Lower River Okement
	• GB108050014660: Torridge (Lew to Estuary)

Due to programme constraints, the WFD Level 2 Assessment has not been undertaken for this option.

2.7.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment is required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the Level 2 SAI-RAT assessment has not been undertaken for this option.

2.7.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor compensation flow rates and downstream water levels in the West Okement River to avoid adverse effects on habitats, water-dependent species, and sensitive hydrological receptors.
- Apply seasonal operational constraints, ensuring reductions occur only when flows are sufficient to protect the ecological requirements of Atlantic salmon, otter, and SAC/SSSI habitats.
- Undertake regular monitoring of downstream water quality (e.g., dissolved oxygen, temperature, turbidity) to identify ecological stress during drought-related low flows.
- Continue best-practice environmental management during reservoir operations, incorporating findings from WINEP investigations to refine flow-management conditions.

- Monitor peatland conditions surrounding the reservoir to maintain hydrological stability and avoid desiccation during drought periods.

2.7.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- An HRA Appropriate Assessment to confirm the absence of adverse effects on the integrity of the Dartmoor SAC.
- A WFD Level 2 assessment for the West Okement, Middle and Lower Okement Rivers, and the Torridge system to improve confidence in predicted water-quality and hydro-morphological impacts.
- Further INNS SAI-RAT assessment.
- Further hydroecological studies and hydrological modelling are required to assess drought-compounded effects on migratory fish, blanket bog, mixed mire habitats, and other sensitive receptors downstream.
- Additional baseline assessment of archaeological and paleoenvironmental deposits is recommended to determine the sensitivity of water-dependent heritage assets.
- Climate-change scenario analysis is required to evaluate how more frequent and severe drought periods may amplify the effects of reduced compensation flows.

2.8 R-25: Roadford Reservoir - reduce compensation flow

2.8.1 SEA Summary Findings

No major negative effects have been identified in relation to R-25. Moderate negative effects have been identified for objective 1.2 *'Protect and enhance ecology biodiversity, including habitats and species of principal importance and water-sensitivity'*, 2.2 '*Provide a sustainable water supply in times of drought'* and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'*. This is due to the option resulting in a reduced compensation flow from Roadford Reservoir, which may have adverse effects on principal habitats and species as well as prolonging recovery periods post-drought back to typical baseline conditions. The reduced flow may also adversely affect recreational opportunities and the visual amenity downstream of the reservoir.

Minor negative effects have been identified for all other objectives, other than 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'*, and 7 '*Minimise resource use and waste production'*. These minor negative effects largely relate to reduced water availability downstream of the reservoir, which could lead to disturbance of habitats, reduced water quality, potential soil destabilisation, disturbance to buried archaeology, and adverse impacts on visual amenity. These impacts could also lead to negative effects on tourism and businesses.

No major or moderate positive effects were identified for any of the options. Minor positive effects have been identified for objective 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'.* This is due to the potential for the option to support higher water levels within the Meldon Reservoir during drought conditions, which may benefit habitats and species that rely on these water sources.

Minor positive effects have also identified in relation to objective 1.3 '*Reduce the spread or presence of INNS*', due to the potential negative response of some INNS species resulting from the increased wetted area in Roadford Reservoir. In addition, minor positive effects have been identified for objectives 2.2, as retaining more water in Roadford Reservoir may improve water availability and quality due to dilution effects.

The population and human health objectives 6.1 and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'* have been assessed as having minor positive effects. These positive effects are due to the option helping to sustain water supplies during drought periods, supporting visual amenity and recreation at Roadford Reservoir, and supporting local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have been identified for the remaining objectives. This is because the option is not expected to increase flood risk, and does not require any new infrastructure or construction activities, meaning the option is not expected to increase operational or embodied carbon.

Option Ref	Biodiversity					Water				Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3		2.1	2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
R-25	-	--	+	-	+	-	--	+	0	-	0	-	-	--	+	-	+	0

2.8.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Two Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 11.4km east)	Tamar Estuaries Complex SPA (approximately 24km south, 45.8km downstream)

Potential for Significant Effects (AA required)	No Likely Significant Effects
Plymouth Sound & Estuaries SAC (approximately 18.7km south, 34km downstream)	

Following the HRA screening, potential adverse effects on Dartmoor SAC and the Plymouth Sound & Estuaries SAC were identified. The HRA AA identified that reduced downstream flow on the River Tamar, River Wolf, River Thrushel and River Lyd may result in changes to habitat suitability for migratory Atlantic salmon.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Lyd and Tamar meet the flow targets and therefore do not adversely affect Atlantic salmon associated with the above designated sites. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the integrity of Dartmoor SAC or the Plymouth Sound & Estuaries SAC. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08SW100019g) and the production of an EAR.

2.8.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30847000: Roadford Lake	• GB108047007860: Lower River Tamar
• GB108047008020: Wolf	
• GB108047008010: Thrushel	
• GB520804714300: PLYMOUTH TAMAR	
• GB40802G806700: Tamar	
• GB108047007731: Lower River Lyd	
• GB108047007910: Tamar (River Lyd to River Inny)	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108047007860	**Lower River Tamar**	**Low / Low**	**No**	**No**	**No**	1 (minor localised impact)

The Level 2 WFD assessment identified a minor negative effect both pre and post-mitigation. There is not expected to be a deterioration between status classes, impediments to GES / GEP, or a compromise to waterbody objectives. The assessment concluded that the option will not assist attainment of water body objectives for the Lower River Tamar, due changes in flow and velocity which could lead to an increase in sedimentation deposition, changes in hydromorphology, and water quality.

2.8.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment was required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

The Level 2 INNS assessment Identified records for nine INNS present in the Lower River Tamar (Jenkins' spire shell, Physa acuta Crangonyx pseudogracilis, Giant hogweed, Monkey-flower, Canadian pondweed, Japanese knotweed, Himalayan balsam, and Rainbow trout), and three INNS in Roadford Reservoir (Australian swamp stonecrop, Nuttall's pondweed, and Jenkins' spire shell).

For the Lower River Tamar, the INNS assessment identified that the decrease in average flow velocity is likely to have a positive or variable response to the INNS listed above. Lower flows allow for longer settlement times for plant establishment, however decreasing flow rates may create conditions less suitable for bivalve species and fish INNS. The decrease in wetted area and average depth was identified as being positive for riparian vegetation INNS (Giant hogweed, Monkey-flower, Japanese knotweed, and Himalayan balsam) due to providing an increase in viable habitat and therefore, more space for rooting. Conversely, the decrease in wetted area and average depth was identified as being negative or variable for Canadian pondweed, Physa acuta, Rainbow trout, Crangonyx pseudogracilis, and Jenkin's spire shell. This is due to providing less suitable habitat, reducing INNS population fitness.

For Roadford Reservoir, the INNS assessment identified a positive response of Nuttall's pondweed and Jenkins' spire shell, due to an increase wetted areas and water depth potentially providing additional habitat for these species. A negative response was identified for Australian swamp stonecrop due to an increase in wetted area decreasing space for growth. Australian swamp stonecrop did however have a positive response to an increase in water depth by allowing more space for growth in the water column.

2.8.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Apply and enforce HOF thresholds so that compensation-flow reductions occur only when flows within the River Lyd and River Tamar remain sufficient to support hydrological and ecological requirements.
- Adjust compensation-flow reductions seasonally to meet flow targets for qualifying features of the Dartmoor SAC (Atlantic salmon) and the Plymouth Sound & Estuaries SAC (allis shad), ensuring operational decisions support favourable conservation status.
- Regularly monitor downstream water quantity and quality (e.g., flow, turbidity, nutrients, dissolved oxygen) to identify ecological stress during drought-related low-flow periods.
- Implement operational controls in coordination with the Environment Agency to ensure compensation-flow reductions remain compliant with South West River Basin Management Plan targets and do not create adverse ecological conditions in functionally linked watercourses.
- Maintain reservoir water levels to support water quality and recreation while balancing ecological sensitivity downstream during extended drought periods.

2.8.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Further hydroecology studies and hydrodynamic modelling are required to understand how compensation-flow reductions influence downstream habitat availability and migratory triggers for Atlantic salmon and allis shad.
- Additional review of baseline ecological data is needed to identify data gaps and inform survey requirements, including targeted fish studies (migration timing, spawning behaviour, population structure).
- Climate-change scenario analysis is required to assess how increasing drought frequency and magnitude may compound low-flow conditions when compensation releases are withheld.
- A detailed EAR is needed to incorporate findings from previous investigations and determine project-level regulatory requirements, including any necessary refinements to mitigation measures.
- Further assessment of water-dependent heritage assets is recommended to establish the sensitivity of archaeological or paleoenvironmental deposits to reduced water levels.

2.9 R-26: Upper Tamar Lake - reduce compensation flow

2.9.1 SEA Summary Findings

No major negative effects have been identified in relation to R-26. Moderate negative effects have been identified for objective 1.1 '*Protect and enhance designated ecological sites*', 1.2 *'Protect and enhance ecology biodiversity, including habitats and species of principal importance and water-sensitivity'*, 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to the option resulting in a reduced compensation flow from Upper Tamar Lake, which may have adverse effects on designated sites (Dartmoor Sac and Brendon and Vealand Fen SSSI), principal habitats and species as well as reduce the water quality of the River Tamar. This may prolong recovery periods post-drought back to typical baseline conditions.

Minor negative effects have been identified for all other objectives, other than 1.3 '*Reduce the spread or presence of INNS*', 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'*, and 7 '*Minimise resource use and waste production'*. These minor negative effects relate to potential soil destabilisation, reduced resilience to climate-related drought, disturbance to buried archaeology, and adverse impacts on visual amenity, tourism and recreational activities along the River Tamar.

No major or moderate positive effects were identified for any of the options. Objectives 1.2, 2.1, 2.2, 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'* have all been assessed as a minor positive effect for R-26. This is due to the potential for the option to retain more water within Upper Tamar Lake during drought conditions, which may benefit habitats and species that rely on this water source. Higher water levels may improve water availability and quality due to dilution effects. The option has potential to help sustain water supplies during drought periods, supporting visual amenity and recreation, and supporting local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have also been identified for the remaining objectives. This is because the option is expected to have minimal impact on INNS risk, is not expected to increase flood risk, and does not require any new infrastructure or construction activities, meaning the option is not expected to increase operational or embodied carbon.

Option Ref	Biodiversity				Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
R-26	--	--	+	0	--	+	--	+	0	-	0	-	-	-	+	-	+	0

2.9.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. One Habitats Site was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 33km southeast)	Culm Grasslands SAC (approximately 3.7km southeast)
	Bristol Channel Approaches/Dynesfeydd Mor Hafren SAC (approximately 9km west)
	Tintagel-Marsland-Clovelly Coast SAC (approximately 8.5km west)
	Plymouth Sound and Estuaries SAC (approximately 43km south, 61km downstream)
	Tamar Estuaries Complex SPA (approximately 47km south, 74km downstream)

Due to programme constraints, the HRA AA has not been undertaken for this option.

2.9.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Six waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30845277: Upper Tamar Lake	• GB108047013920: Upper River Tamar
• GB40802G806700: Tamar	• GB30845324: Lower Tamar Lake
	• GB108047013890: Tamar (Small Brook to Lamberal Water)
	• GB108047008050: Tamar (Small Brook to River Deer)
	• GB108047008030: Tamar (River Ottery to River Deer)
	• GB108047007940: Tamar (River Ottery to River Lyd)

Due to programme constraints, the WFD Level 2 Assessment has not been undertaken for this option.

2.9.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment is required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the Level 2 SAI-RAT assessment has not been undertaken for this option.

2.9.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of compensation flows during operation to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Enforce HOFs and seasonal operating windows to protect downstream low flows and sensitive fen/culm habitats.
- Monitor flows, dissolved Oxygen and temperature in receiving reaches; trigger adaptive releases where ecological stress is detected.
- Apply biosecurity measures consistent with INNS risk screening.
- Maintain public access and information to support reservoir recreation during drought.

2.9.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- WFD Level 2 assessment.
- HRA AA.
- INNS SAI-RAT.
- Hydroecology modelling to confirm status-class risks and habitat sensitivity.
- Climate-change scenario analysis for compounded late-summer drought sequences.
- Incorporate any relevant WINEP findings.

2.10 R-45: River Dart & Littlehempston boreholes - aggregate daily and annual licence limits

2.10.1 SEA Summary Findings

No major negative effects have been identified in relation to R-45. Moderate negative effects have been identified for objective 1.2 *'Protect and enhance ecology biodiversity, including habitats and species of principal importance and water-sensitivity'*, 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to the option having the potential to adversely affect principal habitats and species as well as reduce the water quality within the River Dart, and prolong recovery periods post-drought back to typical baseline conditions.

Minor negative effects have been identified for all other objectives, other than 2.3 '*Reduce flood risk'*, 5 '*Protect and enhance the historic environment, including archaeology'*, and 7 '*Minimise resource use and waste production'*. Minor negative effects relate to potential negative impacts on designated sites such as Dartmoor SAC, a possible increase in INNS population for some species, soil destabilisation along the River Dart, an increase in energy demand which may result in an increase in operational carbon emissions, and adverse impacts on visual amenity, tourism and recreational activities.

No major or moderate positive effects were identified for any of the options. Minor positive effects have been identified for objectives 1.3 '*Reduce the spread or presence of INNS*' and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*. The option has potential to result in a negative INNS response in some populations. Increased abstraction will help to sustain water supplies during drought periods, supporting local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have also been identified for the remaining objectives. This is because the option is not expected to increase flood risk, will have a minimal impact on the historic environment, and does not require any new infrastructure or construction activities.

Option Ref	Biodiversity				Water			Soil	Climate		Historic Env	Population & Human Health			Material Assets
	1.1	1.2	1.3		2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2		7
R-45	-	--	-	+	--	--	0	-	-	-	0	-	-	+	0

2.10.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. One Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 13km northwest, 17km upstream)	South Hams SAC (approximately 5.1km northwest)
	South Dartmoor Woods SAC (approximately 9.1km northwest)
	Lyme Bay and Torbay SAC (approximately 9.5km east)

Following the HRA screening, potential adverse effects on Dartmoor SAC were identified. The HRA AA identified that reduced downstream flow on the River Dart may result in changes to habitat suitability for migratory Atlantic salmon.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Dart meet the flow targets and therefore do not adversely affect Atlantic salmon associated with the above designated sites. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the integrity of

Dartmoor SAC. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08SW100016b) and the production of an EAR.

2.10.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Four waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB510804605900: DART	• GB108046008350: Dart
	• GB40802G800700: Teign, Avon, Dart and Erme
	• GB108046005160: Bidwell Brook
	• GB108046005430: Hems - Lower

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108046008350	Dart	Low / Low	No	Possible	No	2 (adverse impact – risk of deterioration)
GB40802G800700	Teign, Avon, Dart and Erme	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)
GB108046005160	Bidwell Brook	Low / Low	No	No	No	1 (minor localised impact)
GB108046005430	Hems - Lower	Low / Low	No	No	No	1 (minor localised impact)

The Level 2 WFD assessment concluded that the option will not assist attainment of water body objectives for Dart, Teign, Avon, Dart and Erme, Bidwell Brook, and Hems – Lower. This is due to changes in flow velocity and volume which could lead to an increase in sedimentation, changes in water quality, and minor localised impacts to hydrology and morphology.

For the Teign, Avon, Dart and Erme ground waterbody, the option may result in localised changes in groundwater levels which may reduce the ability of the groundwater body to provide typical baseflow to the Dart and adjacent watercourses. There is also the potential for the option to mobilise contamination through the groundwater body. Overall, the Level 2 assessment concluded a moderate adverse effect both pre and post-mitigation for the Teign, Avon, Dart and Erme ground waterbody and the Dart. The option could possibly result in impediments to GES and GEP and may compromise waterbody objectives.

For the other waterbodies, a minor adverse effect was identified both pre and post-mitigation. The option is not expected to result in deterioration between status classes, impediments to GES / GEP or compromise waterbody objectives.

2.10.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A low risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Increase abstraction volume (relative to baseline) - temporary	• Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility. • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.	Cross WFD Operational Catchment transfer, receiving catchment is receiving to WTW only	Periodical	Low	2 = Low

The Level 2 INNS assessment identified records for five INNS within the River Dart (Himalayan balsam, Japanese knotweed, Monkey-flower, Jenkin's spire shell, and Goldfish. The assessment identified that the decrease in flow velocity, decrease in wetted area and decrease in average depth is likely to result in a positive response for riparian vegetation INNS (Himalayan balsam, Japanese knotweed, and Monkey-flower) due to providing an increase in viable habitat and therefore, more space for rooting.

The decrease in flow velocity, decrease in wetted area and decrease in average depth was identified to result in a possible negative/ variable for Goldfish due to changes in habitat quality, reduction in viable habitat, and change to swimming, feeding and reproduction conditions. For Jenkin's spire shell, the decrease in flow velocity is likely to result in a positive response due to the species preferring slow flowing waterbodies. However, the decrease in wetted area and water depth has been identified as negative/variable due to reducing aquatic habitat and possibly food availability.

2.10.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Apply HOFs and seasonal abstraction patterns aligned to sensitive periods for qualifying features and estuarine receptors; cease or reduce abstraction as thresholds are approached.
- Implement enhanced downstream monitoring (flows, conductivity/salinity, DO, temperature) to protect downstream conditions.
- Operational abstractions should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Dartmoor SAC, in order to achieve favourable conservation status (FCS) and good ecological status (GES). For this option, flows which are sufficient for migrating Atlantic salmon (both upstream adult and downstream smolt) must be considered.
- Maintain biosecurity and INNS controls for any inter-source water movements/equipment transfers.

2.10.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydrogeological/hydroecological modelling to quantify aquifer–river interactions and estuarine response to aggregated abstraction.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify specific migratory periods for this river and the proportion of fish migrating at different times of the year.
- Targeted surveys of migratory fish and estuarine communities to refine operational windows.

- INNS Level 2 SAI-RAT refinement to clarify species-specific responses under altered flow regimes.
- Incorporation of outcomes from relevant WINEP studies into the EAR.

2.11 R-48: Roadford Reservoir - reduce fish bank releases

2.11.1 SEA Summary Findings

No major negative effects have been identified in relation to R-48. Moderate negative effects have been identified for objectives 1.1 '*Protect and enhance designated ecological sites*', and 2.2 '*Provide a sustainable water supply in times of drought'.* This is due to the option having the potential to adversely affect designated sites, as well as prolong recovery periods post-drought back to typical baseline conditions.

Minor negative effects have been identified for all other objectives, other than 1.3 '*Reduce the spread or presence of INNS'*, 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production'*. These minor negative effects largely relate to potential negative impacts on principal habitats and species, a reduction in water quality, soil destabilisation, further depletion of water levels within the river system in the short-term, and adverse impacts on the historic environment as well as visual amenity and tourism and recreational activities.

No major or moderate positive effects were identified for any of the options. Minor positive effects have also been identified for objectives 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 2.1 '*Protect and enhance the quality of the water environment and water resources'*, 2.2, 6.1 *'Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity*' and 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*. Positive effects largely relate to retaining more water within Roadford Reservoir, which may benefit principal habitats and species and improve the water quality of the reservoir. The option will also sustain water supplies during drought periods and improve visual amenity and recreation at Roadford Reservoir, which may support local businesses, tourism and agriculture which is especially important in the Roadford WRZ where there is a large increase in tourism during the summer months.

Neutral effects have also been identified for the remaining objectives. This is because the option is not expected to increase flood risk, will have a minimal impact on the historic environment and INNS, and does not require any new infrastructure or construction activities.

Option Ref	Biodiversity				Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3	2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
R-48	--	-	+	0	-	+	--	+	0	-	0	-	-	-	+	-	+	0

2.11.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Two Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Dartmoor SAC (approximately 11.4km east)	Tamar Estuaries Complex SPA (approximately 24km south, 45.8km downstream)
Plymouth Sound & Estuaries SAC (approximately 18.7km south, 34km downstream)	

Due to programme constraints, the HRA AA has not been undertaken for this option.

2.11.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
• GB30847000: Roadford Lake	• GB108047008020: Wolf
• GB108047007910: Tamar (River Lyd to River Inny)	• GB108047008010: Thrushel
• GB108047007860: Lower River Tamar	• GB108047007731: Lower River Lyd
• GB520804714300: PLYMOUTH TAMAR	
• GB40802G806700: Tamar	

Due to programme constraints, the WFD Level 2 Assessment has not been undertaken for this option.

2.11.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment is required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the Level 2 SAI-RAT assessment has not been undertaken for this option.

2.11.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Define and apply HOF-linked trigger rules for fish-bank releases to balance downstream ecological needs with reservoir storage protection.
- Operate a real-time monitoring and adaptive management protocol across Wolf, Lyd and Tamar control points.
- Coordinate with the EA on event-based releases to support fish passage while safeguarding estuarine water-quality objectives.
- Maintain biosecurity and continue standard pollution prevention at outlet structures.

2.11.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Further assessment including; WFD Level 2, HRA AA and INNS SAI-RAT.
- Integrated river–estuary modelling to test fish-bank release magnitudes/timings against ecological triggers and estuarine quality standards.
- Targeted monitoring of migratory fish presence/timing to refine trigger curves and event design.
- Review cumulative interactions with other Roadford operations (e.g., compensation suspensions).
- Confirm yield and storage availability under multi-season drought sequences.

MOTT MACDONALD

SBB Drought Plan 2027

Appendix 9: Drought Option Summaries – Wimbleball

Project:	SBB Drought Plan 2027 Environmental Assessments		
Our reference:	100125254-MM-RP-SEA-023-B		
Prepared by:	I.N.	**Date:**	24/03/2026
Approved by:	K.M.	**Checked by:**	C.J.
Subject:	Drought Option Summaries – Wimbleball WRZ		

1 Wimbleball Drought Option Summaries

The below summaries provide an overview of the environmental assessments undertaken to date for the options within the Wimbleball Resource Zone (WRZ), in support of the South West Water, Bournemouth Water, and Bristol Water (SBB) Drought Plan 2027. This includes Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) assessment, Invasive Non-native Species (INNS) assessment, and the option-level Strategic Environmental Assessment (SEA), which incorporates wider environmental considerations, such as effects on biodiversity, historic environment, soils, and resources.

Further information including the full assessments can be found within the SEA Environmental Report and Technical Appendices. The option-level SEAs can be found within Annex H-N, and the Technical Appendices for HRA, WFD and INNS within Annex O-Q.

The Wimbleball options include:

- W-03: Wimbleball Reservoir - reduce compensation flow
- W-06: Brampford Speke & Stoke Canon - abstract from new source
- W-09: River Exe to Wimbleball Reservoir - extend pumped storage abstraction season to include April and May
- W-22: Wimbleball Reservoir - reduce fish bank releases

2 Wimbleball WRZ

2.1 WIM-03 - Wimbleball Reservoir - reduce compensation flow

2.1.1 SEA Summary Findings

No major negative effects were identified in relation to WIM-03. A moderate negative effect was identified in relation to objective 2.2 '*Provide a sustainable water supply in times of drought*', due to potential reduction in water quality and effects on the River Exe and the River Haddeo. A moderate negative effect was also identified in relation to objective 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'* due to potential impacts on geological SSSIs and areas of peat.

A minor negative effect was identified for all other objectives, other than 2.3 *'Reduce flood risk',* 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimal resource use and waste production'*, which were all assessed as neural. Minor negative effects are largely attributed to the possible reduction in water quality and quantity downstream of the option, resulting in possible effects on designated sites such as the Exe Estuary SSSI, adverse effects on aquatic habitats and species, increased INNS populations, and possible degradation of soils. Visual amenity, recreation use and tourism, such as fishing and water sports associated with the affected rivers such as the River Exe, and River Haddeo may be negatively impacted due to the reduction in water quantity and quality within the river systems. In addition, a reduction in water quantity could also impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions.

No major or moderate positive effects have been identified in relation to WIM-03. Minor positive effects were identified across all of the biodiversity objectives. These effects are related to possible enhancements to designated sites such as the South Exmoor SSSI, due to retaining water in the natural environment (in the reservoir); benefits to habitats and species through making more water available in certain water sources; and a possible reduction in INNS species.

Minor positive effects have also been identified across the water objectives 2.1 and 2.2, related to possible improvements to water quality when water is retained within a reservoir. Furthermore, temporarily reducing the compensation flow may ensure a sustained level of some flow downstream for a longer period as a drought continues.

A minor positive effect was also identified for options in relation to the soil objective due to maintaining soil stability. Finally, a minor positive effect was identified for the two population and human health objectives, due to helping to sustain water supplies during drought which will benefit visual amenity and recreation, and support local businesses, tourism and agriculture.

Neutral effects were also identified for the remaining objectives due to the option not affecting food risk and not resulting in an increase in carbon emissions or other resources.

Option Ref	Biodiversity						Water					Soil		Climate		Historic Env	Population & Human Health				Material Assets
	1.1		1.2		1.3		2.1		2.2		2.3	3		4.1	4.2	5	6.1		6.2		7
W-03	-	+	-	+	-	+	-	+	--	+	0	--	+	0	-	-	-	+	-	+	0

2.1.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Exmoor Heaths (approximately 200m south)
	Exmoor and Quantock Oakwoods SAC (approximately 5km west)
	Exe Estuary SPA (approximately 7.6km south, 10.3km downstream)
	Exe Estuary Ramsar (approximately 7.6km south, 10.3km downstream)

2.1.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB30844471: Wimbleball Lake	GB108045015050: Exe (Barle to Culm)
GB108045020900: Upper River Haddeo	GB108045009060: Exe (Culm to Creedy)
GB108045015090: Lower River Haddeo	GB108045009040: Exe (Creedy to Estuary)
GB108045015060: Exe (Haddeo to Barle)	
GB510804505600:EXE	
GB40802G801800: Central Devon and Exe - Aylesbeare Mudstone	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108045015050	Exe (Barle to Culm)	Low / Low	No	No	No	1 (minor localised impact)
GB108045009060	Exe (Culm to Creedy)	Low / Low	No	No	No	1 (minor localised impact)
GB108045009040	Exe (Creedy to Estuary)	Low / Low	No	No	No	1 (minor localised impact)

The assessment confirmed that three waterbodies required a Level 2 WFD assessment. This assessment identified the maximum impact score was minor negative both pre and post mitigation for all three waterbodies. No deterioration is anticipated between status classes impediments to Good Ecological Status (GES) / Good Ecological Potential (GEP) and will not compromise the water body objectives. These waterbodies will also not assist with the attainment of water body objectives.

2.1.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. Although no risk of transfer was identified, Level 2 SAI-RAT assessment was required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

The INNS Level 2 assessment identified records for three INNS species within Wimbleball Reservoir (Nuttall's pondweed, Australian swamp stonecrop, and Himalayan balsam), and six species within the Exe (Barle to Culm) waterbody (Australian swamp stonecrop, Nuttall's pondweed, Jenkins' spire shell, Himalayan balsam, Rainbow trout, and Crangonyx pseudogracilis).

The assessment concluded that the option may result in a decrease in average flow velocity, decrease in wetted area and decrease in average depth for the Exe (Barle to Culm) waterbody, which may increase in INNS population fitness due to an increase in viable habitat. For Wimbleball Reservoir, the option is likely to increase the wetted area and increase in average depth which may decrease the INNS population fitness due to a reduction in viable habitat.

2.1.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Careful monitoring of water quality to minimise any potential impacts on designated and non-designated sites.
- Monitor the rates of abstraction during operation to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- The assessment assumes any transferred INNS would be treated/removed at a water treatment facility.
- Hydroecology assessment, hydromorphological survey, aquatic baseline survey and hydrological modelling of the impacts of discharge cessation on flow, hydromorphology, water quality and biology within the Exe, should be undertaken to understand the local implications of this reduction in compensation flow.
- Consider the use of renewables to provide energy.

2.1.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Consider findings from the Exe catchment Environmental Destination investigation.
- The WFD Level 2 assessment has been completed without modelling and hydroecological assessment. As such its scoring is precautionary.
- Review of all additional baseline ecological WFD data, including results of any surveys already undertaken for this scheme. This should include a review of any structures where fish passage could be affected by reduced flow.

- Hydroecology assessment, hydromorphological survey, aquatic baseline survey and hydrological modelling of the impacts of discharge cessation on flow, hydromorphology, water quality and biology within the Exe.
- Further information about option, including details on when the compensation flow is reduced (summer or winter) as well as the Hands-off Flow (HOF) conditions at Pynes and Allers.
- Climate resilience measures opportunities could be considered in the option.

2.2 W-06: Brampford Speke & Stoke Canon - abstract from new source

2.2.1 SEA Summary Findings

No major negative effects have been identified for W-06. A moderate negative effect has been identified in relation to objectives 2.2 '*Provide a sustainable water supply in times of drought'* and 3 *'Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'*. This is due to a potential reduction in water availability in the natural system which may prolong recovery periods post-drought back to baseline conditions, as well as the potential for the option to result in soil erosion.

A minor negative effect has been identified for all other objectives, other than 2.3 '*Reduce flood risk*', 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity*', and 6.2 '*Sustain water supplies for the local economy, including tourism, business and agriculture'*. This is due to factors such as the option having the potential to affect designated sites and principal habitats within the vicinity of the boreholes, a possible increase in INNS populations, reduced quality of groundwater, a temporarily increase carbon emissions related to the installation of pipelines and additional pumping, increased abstraction resulting in reduced resilience to climate-related droughts, and increased use of resources associated with the temporary pumps.

No major or moderate positive effects have been identified for W-06. Minor positive effects have been identified in relation to objectives 1.1 '*Protect and enhance designated ecological sites'*, 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 4.2 '*Increase resilience to climate change risks and hazards'*, 6.1 and 6.2. These were mainly identified close to the release location for the abstracted water (River Exe). For example, the increase water availability at the River Exe is likely to positively impact Brampton Speke SSSI and other principal habitats, the option will improve resilience to drought by increasing the water availability downstream, as well as benefits to recreational activities, visual amenity and tourism along the river.

A neutral effect was identified for objective 2.3 due to the option having minimal effect on flood risk.

Option Ref	Biodiversity					Water			Soil	Climate			Historic Env	Population & Human Health		Material Assets
	1.1		1.2		1.3	2.1	2.2	2.3	3	4.1	4.2		5	6.1	6.2	7
W-06	-	+	-	+	-	-	--	0	--	-	-	+	-	+	+	-

2.2.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Exe Estuary SPA (approximately 7.6km south, 10.3km downstream)
	Exe Estuary Ramsar (approximately 7.6km south, 10.3km downstream)

2.2.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
N/A	• GB108045015050: Exe (Barle to Culm)
	• GB40801G801700: Permian Aquifers in Central Devon
	• GB108045014970: Lower Culm

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108045015050	Exe (Barle to Culm)	Low / Low	Possible	Possible	No	3 (major adverse impact – risk of deterioration)
GB108045014970	Lower Culm	Low / Low	No	No	No	1 (minor localised impact)
GB40801G801700	Permian Aquifers in Central Devon	Low / Low	No	No	No	1 (minor localised impact)

The Level 2 WFD assessment concluded that for the Lower Culm and Permian Aquifers in Central Devon, no deterioration is anticipated between status classes impediments to GES / GEP and will not compromise the water body objectives. These waterbodies will also not assist with the attainment of water body objectives. A moderate effect was identified pre-mitigation, and a minor negative effect was identified post-mitigation.

A major effect was identified for the Exe (Barle to Culm), which may result in the deterioration is anticipated between status classes, impediments to GES / GEP, and may compromise the water body objectives.

2.2.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A low risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Increase abstraction volume (relative to baseline) - temporary	• Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility. • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.	Transfer within WFD water body	Periodical	Low	2 = Low

The INNS Level 2 assessment identified records for nine INNS present within the Exe (Barle to culm) water body (Canadian pondweed, Nuttall's pondweed, Himalayan Balsam, Japanese knotweed, North American signal crayfish, Crangonyx pseudogracilis, Jenkins' spire shell, Rainbow trout, and Common carp). The assessment concluded that the option is likely to increase in average flow velocity, increase in wetted area, and increase in average depth, which may result in an increase in INNS population fitness due to an increase in viable habitat.

2.2.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor groundwater abstraction rates at Brampford Speke and Stoke Canon to ensure compliance with licensed volumes and to avoid reductions in groundwater levels that could affect sensitive habitats.
- Apply best practice pollution prevention and construction management measures during installation of temporary pipelines to minimise risks to surface water and groundwater quality.
- Implement operational monitoring of flows and water quality in the River Exe to ensure downstream habitats and species remain within acceptable thresholds under drought conditions.
- Manage reinstatement works at the boreholes to minimise waste generation and ensure responsible handling and disposal of any materials arising.
- Incorporate best practice landscape and visual amenity measures where temporary infrastructure is visible near recreational areas along the River Exe.
- Ensure INNS management procedures are followed during any reinstatement or water transfer activities to minimise risk of spread between boreholes and the River Exe.

2.2.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Further hydrogeological assessment is required to understand the influence of renewed groundwater abstraction on local groundwater flow and groundwater-dependent habitats.
- Hydrological and water quality modelling is required to quantify downstream effects of increased discharge and re-abstraction between Brampford Speke, Stoke Canon and Pynes WTW.
- Review findings of ongoing WINEP investigations for the Exe catchment, including potential implications for deprived reaches between abstraction and discharge points.
- Assess potential ecological impacts associated with altered groundwater conditions, including targeted surveys for groundwater-dependent habitats and species.
- Confirm the operational feasibility and condition of disused borehole infrastructure, including any engineering works required to enable drought-period deployment.
- Review AMP7 investigations relating to groundwater abstraction impacts on the River Exe to refine assessment of potential effects and appropriate mitigation.

W-09 – River Exe to Wimbleball Reservoir - extend pumped storage abstraction season to include April and May

2.2.7 SEA Summary Findings

No major negative effects have been identified for W-09. A moderate negative effect has been identified in relation to objective 1.3 '*Reduce the spread or presence of INNS*'. This is due the potential for the option to result in an increase in INNS populations.

A minor negative effect has been identified for all other objectives, other than 1.1 '*Protect and enhance designated ecological sites*', 2.3 '*Reduce flood risk*' and 7 '*Minimise resource use and waste production*'. This is due to the option having the potential to effect principal habitats downstream of the abstraction point, reduce the water quality within the River Exe, reduced flows resulting in soil destabilisation, a temporarily increase in carbon emissions through the extension of the pumped storage scheme, increased abstraction resulting in reduced resilience to climate-related droughts, and adverse effects of recreational activities, and effects on visual amenity and tourism along the River Exe.

No major or moderate positive effects have been identified for W-09. Minor positive effects have been identified in relation to objectives 1.1, 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 1.3, 2.3, 4.2 *'Increase resilience to climate change risks and hazards'*, 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity*', and 6.2 '*Sustain water supplies for the local economy, including tourism, business and agriculture'*. These were mainly identified at the storage location (Wimbleball Reservoir). For example, the increase water availability is likely to positively impact the South Exmoor SSSI and other principal habitats, decrease the presence of INNS for some species, may improve resilience to drought by increasing water availability, as well as supporting recreational activities, visual amenity and tourism associated with the reservoir.

A neutral effect was identified for objective 7, due to the option not requiring any construction works or increased us of materials.

Option Ref	Biodiversity					Water			Soil	Climate			Historic Env	Population & Human Health				Material Assets
	1.1	1.2		1.3		2.1	2.2	2.3	3	4.1	4.2		5	6.1		6.2		7
W-09	+	-	+	--	+	-	-	+	-	-	-	+	-	-	+	-	+	0

2.2.8 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Exmoor Heaths (approximately 100m south)
	Exmoor and Quantock Oakwoods SAC (approximately 3.9km northwest)
	Exe Estuary SPA (approximately 35km south, 48.8km downstream)
	Exe Estuary Ramsar (approximately 35km south, 48.8km downstream)
	Culm Grasslands SAC (8km southwest)

2.2.9 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Four waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB510804505600:EXE	GB108045015060: Exe (Haddeo to Barle)
GB30844471:Wimbleball Lake	GB108045015050:Exe (Barle to Culm)
GB40802G801800:Central Devon and Exe - Aylesbeare Mudstone	GB108045009060:Exe (Culm to Creedy)
	GB108045009040:Exe (Creedy to Estuary)

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108045015060	Exe (Haddeo to Barle)	Low / Low	No	No	No	1 (minor localised impact)
GB108045015050	Exe (Barle to Culm)	Low / Low	No	No	No	1 (minor localised impact)
GB108045009060	Exe (Culm to Creedy)	Low / Low	No	No	No	1 (minor localised impact)
GB108045009040	Exe (Creedy to Estuary)	Low / Low	No	No	No	1 (minor localised impact)

The Level 2 assessment concluded that no deterioration is anticipated between status classes impediments to GES / GEP and will not compromise the water body objectives. These waterbodies will also not assist with the attainment of water body objectives. The assessment identified a minor negative effect both pre and post mitigation.

2.2.10 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A moderate risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Extend abstraction season	• Change in volume and timing of existing transfer between locations already connected. • Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment	Periodical	Medium	4 = Moderate

An INNS Level 2 assessment identified records for the presence of five INNS within the River Exe (North American signal crayfish, Japanese knotweed, Himalayan balsam, Jenkins' spire shell, and Rainbow trout), and three INNS within Wimbleball Reservoir (Australian swamp stonecrop, Nuttall's pondweed, and Himalayan balsam). The assessment concluded that the option may result in a decrease in average flow velocity, decrease in wetted area, and a decrease in average depth for the River Exe, which is likely to increase viable habitat and therefore increase INNS population fitness. In comparison for Wimbleball

Reservoir, the option is likely to increase wetted area and increase average depth which will reduce viable habitat and therefore reduce INNS population fitness at that location.

2.2.11 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor abstraction rates during operation to ensure flow reduction does not exceed thresholds needed to protect downstream ecological and hydrological conditions.
- Apply and enforce HOF conditions to prevent abstraction during periods when flows fall below agreed ecological thresholds.
- Maintain regular monitoring of water quantity and quality within the River Exe to identify emerging risks to designated sites and aquatic habitats associated with reduced dilution and lower flow conditions.
- Implement best-practice measures at Wimbleball Reservoir to ensure storage operations support recreational use, water quality, and protection of adjacent sensitive habitats such as South Exmoor SSSI.
- Maintain and periodically review operational records for pumped storage to ensure early detection of any effects on downstream environmental receptors.
- Apply INNS control measures at abstraction and discharge locations to limit risk of spread under altered habitat conditions.

2.2.12 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Additional hydroecological, hydrological and water-quality modelling is required to determine how extended pumped-storage abstraction in April–May affects downstream flows, habitat conditions and dilution capacity.
- Further clarity is required regarding HOF thresholds, abstraction limits and operational timing to refine future environmental assessments.
- Findings from the Exe catchment Environmental Destination investigation should be incorporated once available to improve understanding of cumulative catchment-scale effects.
- Targeted ecological surveys may be required to identify habitat sensitivity during the early growing season when extended abstraction occurs.
- Additional evidence on recovery rates of the Exe following periods of reduced flow will be necessary to confirm the magnitude and duration of downstream effects.
- Further assessment is needed to determine the influence of seasonal abstraction on climate resilience, including interactions with long-term hydrological change.

2.3 W-22 – Wimbleball Reservoir - reduce fish bank releases

2.3.1 SEA Summary Findings

No major negative effects have been identified for W-22. Moderate negative effects have been identified in relation to objectives 2.1 '*Protect and enhance the quality of the water environment and water resources'*, 2.2 '*Provide a sustainable water supply in times of drought*' and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity*'. This was due to the potential for the option to reduce the water quality of the waterbodies downstream of the reservoir, potential for the reduced flow to prolong recovery periods post-drought back to typical baseline conditions, as well as effects on recreation and visual amenity as the option is located within Exmoor National Park.

A minor negative effect has been identified for all other objectives, other than 1.3 '*Reduce the spread or presence of INNS'*, 2.3 '*Reduce flood risk*', 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production*'. This is due to the option having the potential to effect designated sites such as the Exe Estuary SSSI and principal habitats downstream of the abstraction point, reduce the water quality within the River Exe, reduced flows resulting in soil destabilisation, reduced flows resulting in reduced resilience to climate-related droughts, and adverse effects of tourism, business and agriculture.

No major or moderate positive effects have been identified for W-22. Minor positive effects were identified for biodiversity objectives 1.1 '*Protect and enhance designated ecological sites'*, 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*. These effects are related to possible enhancements to designated sites such as the South Exmoor SSSI, due to retaining water in the natural environment (in the reservoir), and benefits to habitats and species through making more water available in certain water sources.

Minor positive effects have also been identified across the water objectives 2.1 and 2.2, related to possible improvements to water quality when water is retained within a reservoir. Furthermore, temporarily reducing the compensation flow may ensure a sustained level of some flow downstream for a longer period as a drought continues.

A minor positive effect was also identified for options in relation to the soil objective due to maintaining soil stability. Finally, a minor positive effect was identified for the two population and human health objectives, due to helping to sustain water supplies during drought which will benefit visual amenity and recreation, and support local businesses, tourism and agriculture.

Neutral effects were also identified for the remaining objectives due to the option not resulting in an increased risk of INNS spread, not affecting flood risk and not resulting in an increase in carbon emissions or other resources.

Option Ref	Biodiversity					Water					Soil		Climate		Historic Env	Population & Human Health				Material Assets
	1.1		1.2		1.3	2.1		2.2		2.3	3		4.1	4.2	5	6.1		6.2		7
W-22	-	+	-	+	0	--	+	--	+	0	-	+	0	-	-	--	+	-	+	0

2.3.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Exmoor Heaths (approximately 200m south)

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Exmoor and Quantock Oakwoods SAC (approximately 5km west)
	Exe Estuary SPA (approximately 7.6km south, 10.3km downstream)
	Exe Estuary Ramsar (approximately 7.6km south, 10.3km downstream)

2.3.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Six waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB30844471: Wimbleball Lake	GB108045020900: Upper River Haddeo
GB510804505600:EXE	GB108045015090: Lower River Haddeo
GB40802G801800: Central Devon and Exe - Aylesbeare Mudstone	GB108045015060: Exe (Haddeo to Barle)
	GB108045015050: Exe (Barle to Culm)
	GB108045009060: Exe (Culm to Creedy)
	GB108045009040: Exe (Creedy to Estuary)

Due to programme constraints, the WFD Level 2 assessment has not yet been undertaken for this option. However, it is anticipated that the conclusions would be the same as those for W-03. This will be undertaken as the programme progresses.

2.3.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified, however a Level 2 SAI-RAT assessment is required to assess potential habitat changes.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Fish bank releases	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

Due to programme constraints, the INNS SAI-RAT assessment has not yet been undertaken for this option. However, it is anticipated that the conclusions would be the same as those for W-03. This will be undertaken as the programme progresses.

2.3.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor downstream water levels and flow conditions during reduced fish bank release periods to avoid adverse effects on sensitive aquatic habitats and species.
- Apply and enforce HOF thresholds to ensure reductions in releases occur only when hydrological conditions remain within acceptable ecological limits.

- Maintain monitoring of water quality in the River Haddeo and River Exe to identify any reductions in dilution capacity that may affect water-dependent habitats or designated sites.
- Manage reservoir storage operations to maintain water levels appropriate for adjacent sensitive habitats, including areas of peatland within South Exmoor SSSI.
- Implement best-practice measures for recreation and visual amenity management to minimise effects of temporary low-flow conditions downstream.
- Follow INNS management protocols at operational sites to prevent accidental spread under changing hydrological conditions.

2.3.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- A Level 2 WFD assessment is required to quantify downstream water quality and hydrological impacts associated with reduced fish bank releases.
- Further INNS SAI-RAT is required to establish the effects on INNS populations.
- Further ecological assessment is required to confirm thresholds for aquatic species and habitats under reduced flow conditions during drought.
- Additional information is needed on the timing and seasonal conditions under which fish bank releases may be reduced or withheld.
- Findings from the Exe catchment Environmental Destination investigation should be incorporated into future detailed assessments.
- Additional hydroecological and hydromorphological surveys may be required to determine recovery rates and identify potential long-term implications for river habitats.
- Further baseline collection is recommended for water-dependent heritage receptors to clarify sensitivity to reduced flow conditions.

MOTT MACDONALD

SBB Drought Plan 2027

Appendix 9: Drought Option Summaries - Bristol

Project:	SBB Drought Plan 2027 Environmental Assessments		
Our reference:	100125254-MM-RP-SEA-019-B		
Prepared by:	E.E.	**Date:**	24/03/2026
Approved by:	K.M.	**Checked by:**	C.J.
Subject:	Drought Option Summaries – Bristol WRZ		

1 Bristol Drought Option Summaries

The below summaries provide an overview of the environmental assessments undertaken to date for the options within the Bristol Water Resource Zone (WRZ), in support of the South West Water, Bournemouth Water, and Bristol Water (SBB) Drought Plan 2027. This includes Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) assessment, Invasive Non-native Species (INNS) assessment, and the option-level Strategic Environmental Assessment (SEA), which incorporates wider environmental considerations such as effects on biodiversity, historic environment, soils and resources.

Further information including the full assessments can be found within the SEA Environmental Report and Technical Appendices. The option-level SEAs can be found within Annex H-N, and the Technical Appendices for HRA, WFD and INNS within Annex O-Q.

The Bristol options include:

- BR-27a: Blagdon Reservoir - reduce compensation flow
- BR-27b: Blagdon Reservoir - delay water bank releases
- BR-28a: Reduction of Chew Valley Lake compensation release
- BR-28b: Chew Valley Lake - delay water bank releasesBR-29: Reduction of Chew Magna Reservoir compensation release.
- BR-29: Chew Magna Reservoir - reduce compensation flow
- BR-30: Cheddar Ponds - reduce compensation flow
- BR-31a: River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include October
- BR31b: River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include May
- BR-47: River Axe to Cheddar Reservoir - early commissioning of pumped storage abstraction

2 Bristol WRZ

2.1 BR-27a: Blagdon Reservoir - reduce compensation flow

2.1.1 SEA Summary Findings

No major adverse effects were identified for BR-27a. Two moderate negative effects were identified for Objectives 2.1 '*Protect and enhance the quality of the water environment and water resources*' and 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to the potential for water quality to be reduced within the Congresbury Yeo due to the reduction in compensation flow as dilution of pollutants would be reduced. Additionally, this option would likely have adverse effects on waterbody recovery rates. BR-27a is also within Source Protection Zones (SPZ) 1, 2, and 3, a Drinking Water Surface Zone (DWSZ) and Drinking Water Protection Area (DWPA).

The option was assessed as having a minor negative effect for all three biodiversity objectives due to the potential for a reduced compensation flow to negatively impact habitats and species. Objectives 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'*, 4.2 *'Increase resilience to climate change risks and hazards'* and 5 '*Protect and enhance the historic environment, including archaeology'* were also assessed as minor negative effects due to the reduction in flows within the river systems potentially reducing soil moisture and causing subsidence, increasing the effects of climate-related droughts, and potentially affecting the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions, respectively. A minor negative effect was also identified for both population and human health objectives due to potential negative effects on recreation and visual amenity due to changes to water levels in the Congresbury Yeo.

No major or moderate positive effects were identified for BR-27a. Objectives 1.1 '*Protect and enhance designated ecological sites*', 1.2 *'Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 2.1, 2.2 and both population and human health objectives identified a minor positive effect. This is due to more water being retained within Blagdon Reservoir, leading to benefits for biodiversity, water quality, and recreation/tourism.

Three neutral effects were also identified for objectives 2.3 '*Reducing flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production'* due to there being no impact on flood risk and no additional infrastructure being required resulting in minimal carbon emissions and resource use.

Option Ref	Biodiversity					Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1		1.2		1.3	2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
BR-27a	-	+	-	+	-	--	+	--	+	0	-	0	-	-	-	+	-	+	0

2.1.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Four Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Chew Valley Lake SPA (approximately 5.3km east)	North Somerset and Mendip Bats SAC (approximately 3.9km south)
Severn Estuary SAC (approximately 13.3km west, 14.7km downstream)	Mendip Woodlands SAC (approximately 6.9km southwest)
Severn Estuary SPA (approximately 13.3km west, 14.7km downstream)	Mendip Limestone Grasslands SAC (approximately 8.3km southwest)

Potential for Significant Effects (AA required)	No Likely Significant Effects
Severn Estuary Ramsar (approximately 13.3km west, 14.7km downstream)	

Reduced downstream flow on the Congresbury Yeo may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites. Changes to the water level in Blagdon Lake may alter habitat suitability, abundance and/or distribution of prey items which support qualifying features of the Chew Valley Lake SPA and Severn Estuary SPA.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the Congresbury Yeo meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the Severn Estuary SAC, Severn Estuary SPA, Severn Estuary Ramsar or Chew Valley Lake SPA. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08BW100004) and the production of an EAR.

2.1.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB30943135: Blagdon Lake	GB109052021640: Yeo - source to conf Congresbury Yeo
GB40902G804800: Bristol Triassic	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109052021640	Yeo - source to conf Congresbury Yeo	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)

This assessment identified the maximum impact score was major pre mitigation and moderate post mitigation. Additionally, it is possible that this waterbody will result in deterioration between status classes, impediments to Good Ecological Status (GES) / Good Ecological Potential (GES) and could compromise the water body objectives. This waterbody will also not assist with the attainment of the water body objectives. The WFD Level 2 assessment also concluded ‘the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following recommended further investigations’.

2.1.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified, however, a further Level 2 SAI-RAT assessment was still required due to the potential habitat changes downstream.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

The INNS Level 2 assessment noted records of three INNS species in Blagdon Reservoir, these are: Nuttall's pondweed, Jenkins' spire shell snail, and Rainbow trout. An additional five INNS species had records for the Congresbury Yeo which are: Canadian pondweed, Least duckweed, Water fern, Crangonyx pseudogracillis (shrimp), and Himalayan balsam.

The assessment identified a positive response of Nuttall's pondweed in Blagdon Reservoir with possible positive response of Jenkins' spire shell snail and Rainbow trout. This is due to an increase in wetted areas and water depth potentially providing additional habitat for these species.

The four aquatic vegetation species (Nuttall's pondweed, Canadian pondweed, Least duckweed, and Water fern) identified in the Congresbury Yeo also had an unclear response to reduced compensation flows. This is due to the reduction in flows reducing water velocity as which can provide desirable conditions for slow flowing or still water species as well as leading to higher eutrophication meaning more plant growth, leading to a positive response of INNS. However, the aquatic vegetation will have a negative response to both the decrease in wetted areas and depth. This is due to reduced habitat for plant growth.

Rainbow trout, Jenkins' spire shell snail, Himalayan balsam, and shrimp also all had an unclear response in relation to reduced compensation flows. These INNS all had a mix of responses to the change in flows, wetted areas, and depth.

Additionally, the Level 2 assessment stated that the reduction in water discharged into the Congresbury Yeo could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, which would need to be confirmed following further investigations.

2.1.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of compensation flow to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational reductions in compensation flow must consider seasonal flows and will be restricted to periods when the flow within the Congresbury Yeo is sufficient to support this. A hands-off flow (HOF) above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.
- Operational reductions in compensation flow should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve favourable conservation status (FCS) and good ecological status (GES).
- Lake levels should be maintained at an appropriate level for qualifying interest features of the Chew Valley Lake SPA and Severn Estuary SPA during the sensitive non-breeding periods.

- Implement river restoration measures immediately downstream of where the loss in flow originates.
- Modify or remove (as well as removal of in-channel structures) the addition of fish passes to support habitats.
- Modify the weir without significant changes to channel footprint and design to improve the hydro-morphology of the river.
- Measures to ensure preservation of waterlogged environments, following advice and guidance such as Historic England 2016 ‘Preserving archaeological remains: Decision-taking for sites under development’.

2.1.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the Congresbury Yeo and migratory fish using this watercourse.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability along the Congresbury Yeo for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- Surveys to identify optimal lake conditions for supporting the non-breeding bird assemblage, including Northern shoveler and gadwall, to inform adaptive management of lake water depth.
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.
- Action Specification Form for the River Congresbury Yeo WINEP identified monitoring to understand the effects of works on flow regime and catchment ecology to enable project decisions
- Further investigations into response of INNS to water quality changes is required.
- Investigations of the response of physiochemical parameters recommended.

2.2 BR-27b: Blagdon Reservoir - delay water bank releases

2.2.1 SEA Summary Findings

No major adverse effects were identified for BR-27b. A moderate negative effect was identified for Objective 2.1 '*Protect and enhance the quality of the water environment and water resources*'. This is due to the potential for water quality to be reduced within the Congresbury Yeo due to the delayed water bank release as dilution of pollutants would be reduced, and sediment not washed through the system. Additionally, this option would likely have adverse effects on waterbody recovery rates. BR-27a is also within SPZ 1, 2, and 3, a Drinking Water Surface Zone (DWSZ) and Drinking Water Protection Area (DWPA).

The option identified minor negative effects for all biodiversity objectives due to the potential for a delayed water bank release to negatively impact habitats and species. Objectives 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'*, 4.2 *'Increase resilience to climate change risks and hazards'* and 5 '*Protect and enhance the historic environment, including archaeology'* were assessed as minor negative effects due to the reduction in flows within the river systems potentially reducing soil moisture and causing subsidence, increasing the effects of climate-related droughts, and potentially affecting the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions, respectively. A minor negative effect was also identified for both population and human health objectives due to potential negative effects on recreation and visual amenity due to changes to water levels in the Congresbury Yeo.

No major or moderate positive effects were identified for BR-27b. Objectives 1.1 '*Protect and enhance designated ecological sites*', 1.2 *'Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 2.1, 2.2 and both population and human health objectives were assessed as a minor positive effect. This is due to more water being retained within Blagdon Reservoir, leading to positive effects on biodiversity, water quality, and recreation/tourism.

Three neutral effects were also identified for objectives 2.3 '*Reducing flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production'* due to there being no impact on flood risk and no additional infrastructure being required resulting in minimal carbon emissions and resource use.

Option Ref	Biodiversity					Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1		1.2		1.3	2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
BR-27b	-	+	-	+	-	--	+	-	+	0	-	0	-	-	-	+	-	+	0

2.2.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Four Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Chew Valley Lake SPA (approximately 5.3km east)	North Somerset and Mendip Bats SAC (approximately 3.9km south)
Severn Estuary SAC (approximately 13.3km west, 14.7km downstream)	Mendip Woodlands SAC (approximately 6.9km southwest)
Severn Estuary SPA (approximately 13.3km west, 14.7km downstream)	Mendip Limestone Grasslands SAC (approximately 8.3km southwest)
Severn Estuary Ramsar (approximately 13.3km west, 14.7km downstream)	

Reduced downstream flow on the Congresbury Yeo may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites. Changes to the water level in

Blagdon Lake may alter habitat suitability, abundance and/or distribution of prey items which support qualifying features of the Chew Valley Lake SPA and Severn Estuary SPA.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the Congresbury Yeo meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the Severn Estuary SAC, Severn Estuary SPA, Severn Estuary Ramsar or Chew Valley Lake SPA. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08BW100004) and the production of an EAR.

2.2.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB30943135: Blagdon Lake GB40902G804800: Bristol Triassic	GB109052021640: Yeo - source to conf Congresbury Yeo

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109052021640	Yeo - source to conf Congresbury Yeo	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)

The Level 2 assessment identified the maximum impact score was major pre mitigation and moderate post mitigation. Additionally, it is possible that this waterbody will result in deterioration between status classes, impediments to GES / GEP and could compromise the water body objectives. This waterbody will also not assist with the attainment of the water body objectives. The WFD Level 2 assessment also concluded 'the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following recommended further investigations.'

2.2.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified, however, a further Level 2 SAI-RAT assessment was still required due to the potential habitat changes downstream.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Water bank releases	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat	No transfer	Periodical	None	0 = None

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
	changes may affect INNS populations.				

The INNS Level 2 assessment noted records for three INNS species in Blagdon Reservoir, these are: Nuttall's pondweed, Jenkins' spire shell snail, and Rainbow trout. An additional five INNS species had records in the Congresbury Yeo which are: Canadian pondweed, Least duckweed, Water fern, Crangonyx pseudogracillis (shrimp), and Himalayan balsam.

The assessment identified a positive response of Nuttall's pondweed in Blagdon Reservoir with possible positive response of Jenkins' spire shell snail and Rainbow trout. This is due to an increase in wetted areas and water depth potentially providing additional habitat for these species.

The four aquatic vegetation (Nuttall's pondweed, Canadian pondweed, Least duckweed, and Water fern) identified in the Congresbury Yeo also had an unclear response to reduced water bank releases. This is due to the reduction in flows reducing water velocity as which can provide desirable conditions for slow flowing or still water species as well as leading to higher eutrophication meaning more plant growth, leading to a positive response of INNS. However, the aquatic vegetation will have a negative response to both the decrease in wetted areas and depth. This is due to decreased habitat for plant growth.

Rainbow trout, Jenkins' spire shell snail, Himalayan balsam, and shrimp also all had an unclear response in relation to reduced water bank releases. These INNS all had a mix of responses to the change in flows, wetted areas, and depth.

Additionally, the Level 2 assessment stated that the reduction in water discharged into the Congresbury Yeo could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, and this would need to be confirmed following further investigations. There will not, however, be the addition of new INNS species into either the reservoir or the river.

2.2.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of flows to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational reductions in water bank release flow must consider seasonal flows and will be restricted to periods when the flow within the Congresbury Yeo is sufficient to support this. A HOF above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.
- Operational reductions in flow should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve FCS and GES.
- Lake levels should be maintained at an appropriate level for qualifying interest features of the Chew Valley Lake SPA and Severn Estuary SPA during the sensitive non-breeding periods.
- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- Implement river restoration measures immediately downstream of where the loss in flow originates.
- Modify or remove (as well as removal of in-channel structures) the addition of fish passes to support habitats.

- Modify the weir without significant changes to channel footprint and design to improve the hydro-morphology of the river.
- Recommendation for additional baseline collection and assessment to be undertaken at a more detailed stage to determine the additional potential effects on water-dependent heritage assets and water sensitive historic environments to be identified.
- Measures to ensure preservation of waterlogged environments, following advice and guidance such as Historic England 2016 ‘Preserving archaeological remains: Decision-taking for sites under development’.

2.2.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the Congresbury Yeo and migratory fish using this watercourse.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability along the Congresbury Yeo for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- Surveys to identify optimal lake conditions for supporting the non-breeding bird assemblage, including Northern shoveler and gadwall, to inform adaptive management of lake water depth.
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.
- Action Specification Form for the River Congresbury Yeo WINEP identified monitoring to understand the effects of works on flow regime and catchment ecology to enable project decisions
- Further investigations into response of INNS to water quality changes is required.

2.3 BR-28a: Reduction of Chew Valley Lake compensation release

2.3.1 SEA Summary Findings

No major negative effects have been identified within BR-28a. A moderate negative effect has been identified for BR-28a for objectives 1.3 '*Reduce the spread or presence of INNS'*, 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to changes in water levels which may result in an increase in INNS populations. The reduced flow may also result in the deterioration of waterbodies and reduced water quality in the River Chew.

A minor negative effect was identified for objective 1.1 '*Protect and enhance designated ecological sites'* and 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*' due to the potential for reduced flows to negatively impact species and habitats that rely on the watercourse. A minor negative effect was also identified for objective 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'* due to possible degradation of soils and for objective 4.2 '*Increase resilience to climate change risks and hazards'* due to a possible reduction in resilience to climate-related drought as river levels would be reduced.

For objective 5 '*Protect and enhance the historic environment, including archaeology'*, a reduction in flow could impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions. In addition, for objectives 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustain water supplies for the local economy, including tourism, business and agriculture'*, visual amenity, recreational use and tourism activities such as fishing and kayaking associated with the River Chew may be negatively impacted due to the reduction in water quantity and quality.

No major or moderate positive effects have been identified in BR-28a. Minor positive effects were identified across all biodiversity objectives and population and human health objectives. This is related to retaining more water within the reservoir which may result in possible enhancements to designated sites such as Chew Valley SPA, habitats and species through making more water available during times of drought. Furthermore, this may result in a possible reduction in INNS species. Additionally, visual amenity and recreation activities related to the reservoir may be enhanced. Water objectives 2.1 and 2.2 were also assessed as minor positive, due to possible improvements in water quality within the reservoir and preserving more water in times of drought.

Objectives 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production*' were assessed as neutral effects. This is due to the option not affecting flood risk as well as no new construction being needed for the option.

Option Ref	Biodiversity						Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1		1.2		1.3		2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
BR-28a	-	+	-	+	--	+	--	+	--	+	0	-	0	-	-	-	+	-	+	0

2.3.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Four Habitat Sites was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Chew Valley Lake SPA (adjacent to option)	North Somerset and Mendip Bats SAC (approximately 5.6km southwest)
Severn Estuary SAC (approximately 15.4km north, hydrologically connected approximately 42km downstream)	

Potential for Significant Effects (AA required)	No Likely Significant Effects
Severn Estuary SPA (approximately 15.4km north, hydrologically connected approximately 42km downstream)	
Severn Estuary Ramsar (approximately 15.4km north, hydrologically connected approximately 42km downstream)	

Reduced downstream flow on the River Chew may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites. Changes to the water level in Chew Valley Lake may alter habitat suitability, abundance and/or distribution of prey items which support qualifying features of the Chew Valley Lake SPA and Severn Estuary SPA.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Chew meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the Severn Estuary SAC, Severn Estuary SPA, Severn Estuary Ramsar or Chew Valley Lake SPA. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08MU100151) and the production of an EAR.

2.3.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB30943096: Chew Valley Lake	GB109053021852: Chew - Chew Valley Lake to conf Winford Brook
GB109053027371: Bristol Avon (By Bk to Netham Weir)	GB109053021950: Chew - conf Winford Bk to conf R Avon (Brist)
GB40902G804800: Bristol Triassic	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109053021852	Chew - Chew Valley Lake to conf Winford Brook	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)
GB109053021950	Chew - conf Winford Bk to conf R Avon (Brist)	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)

The Level 2 assessment identified both watercourses had a moderate effect both pre and post-mitigation, with a low confidence in WFD data and option design. It is also possible that there will be deterioration between status classes, impediments to GES / GEP, and the potential that water body objectives would be compromised. Neither waterbody will assist the attainment of the water body objectives.

Chew Valley Lake and Chew - conf Winford Bk to conf R Avon (Brist) was identified as having a less than good status, however this is not due to abstraction.

2.3.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment was required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

The INNS Level 2 assessment identified records of three INNS species in Chew Valley Lake, these are: Canadian pondweed, shrimp, and Jenkins' spire shell snail. An additional four INNS species were noted as present in the River Chew which are: Least duckweed, Nuttall's pondweed, Rainbow trout, and Himalayan balsam.

In Chew Valley Lake, a positive response of Nuttall's pondweed was identified in relation to the reduction in compensation flows. This is likely due to an increased depth and wetted area which provides more space/habitat for plant growth. Furthermore, there was an unclear/possible positive response identified as well for both shrimp and Jenkins' spire shell snail due to increased wetted areas providing better food and habitat availability as well as aiding reproduction and dispersal for shrimp.

The Himalayan balsam also had a positive response in the River Chew in relation to compensation flows, likely related to a reduction in water flows making it easier for vegetation to grow. However, Rainbow trout were identified to have a negative/variable response to reduced compensation flows. This is potentially due to a decrease in wetted areas, depth, and water quality leading to less available habitat.

For the other INNS species in the River Chew, an unclear response was identified in relation to reduced compensation flows, potentially due to different responses in relation to changes in wetted areas, depth, water quality, and water velocity.

The assessment identified that the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters which could potentially exacerbate any impact of pollutants. This could have an adverse effect on physicochemical parameters.

2.3.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of flows to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational reductions in water bank release flow must consider seasonal flows and will be restricted to periods when the flow within the Congresbury Yeo is sufficient to support this. A HOF above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.
- Operational reductions in flow should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve FCS and GES.

- Lake levels should be maintained at an appropriate level for qualifying interest features of the Chew Valley Lake SPA and Severn Estuary SPA during the sensitive non-breeding periods.
- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- Implement river restoration measures immediately downstream of where the loss in flow originates.
- Modify or remove (as well as removal of in-channel structures) the addition of fish passes to support habitats.
- Modify the weir without significant changes to channel footprint and design to improve the hydro-morphology of the river.
- Recommendation for additional baseline collection and assessment to be undertaken at a more detailed stage to determine the additional potential effects on water-dependent heritage assets and water sensitive historic environments to be identified.
- Measures to ensure preservation of waterlogged environments, following advice and guidance such as Historic England 2016 ‘Preserving archaeological remains: Decision-taking for sites under development’.
- The WINEP of the Congresbury Yeo identified an outcome of the project that due to minimal flow accretion downstream of the reservoir, particularly over the summer, reservoir outflow management has a more significant impact in terms of downstream flows, water quality and ultimately ecology than previously understood, which should be considered for this option.

2.3.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the River Chew and migratory fish using this watercourse.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability along the River Chew for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- Surveys to identify optimal lake conditions for supporting the non-breeding bird assemblage, including Northern shoveler and gadwall, to inform adaptive management of lake water depth.
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.
- Monitor and identify opportunities for river restoration to enhance habitat value, including woody debris installation, flow deflectors, bank stabilisation, increased flow diversity, and re-meandering to improve floodplain connectivity post-reservoir construction.
- Impacts on physiochemical parameters to be confirmed following recommended further investigations.
- Specific responses of INNS to water quality changes in the River Chew is to be reviewed following any further water quality investigations.

2.4 BR-28b: Chew Valley Lake - delay water bank releases

2.4.1 SEA Summary Findings

No major negative effects have been identified within BR-28b. A moderate negative effect has been identified for BR-28b for objectives 1.3 '*Reduce the spread or presence of INNS'*, 2.1 '*Protect and enhance the quality of the water environment and water resources'*. This is due to changes in water levels which may result in an increase in INNS populations. The reduced flow may also result in the deterioration of waterbodies and reduced water quality in the River Chew.

A minor negative effect was identified for objective 1.1 '*Protect and enhance designated ecological sites'* and 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*' due to the potential for reduced flows to negatively impact species and habitats that rely on the watercourse. A minor negative effect was also identified for objective 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'* due to possible degradation of soils and for objective 4.2 '*Increase resilience to climate change risks and hazards'* due to a possible reduction in resilience to climate-related drought as river levels would be reduced.

For objective 5 '*Protect and enhance the historic environment, including archaeology'*, a reduction in flow could impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions. In addition for objectives 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustain water supplies for the local economy, including tourism, business and agriculture'*, minor negative effects arose as visual amenity, recreational use and tourism activities such as fishing and kayaking associated with the River Chew may be negatively impacted due to the reduction in water quantity and quality.

No major or moderate positive effects have been identified in BR-28b. Minor positive effects were identified across all biodiversity objectives and population and human health objectives. This is related to retaining more water within the reservoir which may result in possible enhancements to designated sites such as Chew Valley SPA, habitats and species through making more water available during times of drought. Furthermore, this may result in a possible reduction in INNS species. Additionally, visual amenity and recreation activities related to the reservoir may be enhanced. Water objectives 2.1 and 2.2 were also assessed as minor positive, due to possible improvements in water quality within the reservoir and preserving more water in times of drought.

Objectives 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production*' were assessed as neutral. This is due to the option not affecting flood risk as well as no new construction being needed for the option.

Option Ref	Biodiversity						Water					Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1		1.2		1.3		2.1		2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
BR-28a	-	+	-	+	--	+	--	+	-	+	0	-	0	-	-	-	+	-	+	0

2.4.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Four Habitat Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Chew Valley Lake SPA (approximately 1.6km south)	North Somerset and Mendip Bats SAC (approximately 7km south)
Severn Estuary SAC (approximately 18.8km west, 35.5km downstream)	Avon Gorge Woodlands SAC (approximately 9.4km north)

Potential for Significant Effects (AA required)	No Likely Significant Effects
Severn Estuary SPA (approximately 18.8km west, 35.5km downstream)	
Severn Estuary Ramsar (approximately 18.8km west, 35.5km downstream)	

Reduced downstream flow on the River Chew may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites. Changes to the water level in Chew Valley Lake may alter habitat suitability, abundance and/or distribution of prey items which support qualifying features of the Chew Valley Lake SPA and Severn Estuary SPA.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Chew meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the Severn Estuary SAC, Severn Estuary SPA, Severn Estuary Ramsar or Chew Valley Lake SPA. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08MU100151) and the production of an EAR.

2.4.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB30943096: Chew Valley Lake	GB109053021852: Chew - Chew Valley Lake to conf Winford Brook
GB109053027371: Bristol Avon (By Bk to Netham Weir)	GB109053021950: Chew - conf Winford Bk to conf R Avon (Brist)
GB40902G804800: Bristol Triassic	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109053021852	Chew - Chew Valley Lake to conf Winford Brook	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)
GB109053021950	Chew - conf Winford Bk to conf R Avon (Brist)	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)

The Level 2 assessment identified both watercourses had a moderate effect both pre and post-mitigation, with a low confidence in WFD data and option design. It is also possible that there will be deterioration between status classes, impediments to GES / GEP, and the potential that water body objectives would be compromised. Neither waterbody will assist the attainment of the water body objectives.

Chew Valley Lake and Chew - conf Winford Bk to conf R Avon (Brist) was identified as having a less than good status, however this is not due to abstraction.

2.4.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment was required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

The INNS Level 2 assessment identified records for three INNS species in Chew Valley Lake, these are: Canadian pondweed, shrimp, and Jenkins' spire shell snail. An additional four INNS species were identified as having records in the River Chew which are: Least duckweed, Nuttall's pondweed, Rainbow trout, and Himalayan balsam.

In Chew Valley Lake, a positive response of Nuttall's pondweed was identified in relation to the reduction in fish bank releases. This is likely due to an increased depth and wetted area which provides more space/habitat for plant growth. Furthermore, there was an unclear/possible positive response identified as well for both shrimp and Jenkins' spire shell snail due to increased wetted areas providing better food and habitat availability as well as aiding reproduction and dispersal for shrimp.

The Himalayan balsam also had a positive response in the River Chew in relation to reduced fish bank releases, likely related to a reduction in water flows making it easier for vegetation to grow. However, Rainbow trout were identified to have a negative/variable response to reduced fish bank releases. This is potentially due to a decrease in wetted areas, depth, and water quality leading to less available habitat.

For the other INNS species in the River Chew, an unclear response was identified in relation to reduced fish bank releases, potentially due to different responses in relation to changes in wetted areas, depth, water quality, and water velocity.

The assessment identified that the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters which could potentially exacerbate any impact of pollutants. This could have an adverse effect on physicochemical parameters.

2.4.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of flows to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational delay in water bank release must consider seasonal flows and will be restricted to periods when the flow within the Congresbury Yeo is sufficient to support this. A HOF above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.
- Operational reductions in flow should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve FCS and GES.

- Lake levels should be maintained at an appropriate level for qualifying interest features of the Chew Valley Lake SPA and Severn Estuary SPA during the sensitive non-breeding periods.
- Water quantity and quality downstream should be regularly monitored to reduce effects on habitats, species and biodiversity.
- Implement river restoration measures immediately downstream of where the loss in flow originates.
- Modify or remove (as well as removal of in-channel structures) the addition of fish passes to support habitats.
- Modify the weir without significant changes to channel footprint and design to improve the hydro-morphology of the river.
- Recommendation for additional baseline collection and assessment to be undertaken at a more detailed stage to determine the additional potential effects on water-dependent heritage assets and water sensitive historic environments to be identified.
- Measures to ensure preservation of waterlogged environments, following advice and guidance such as Historic England 2016 ‘Preserving archaeological remains: Decision-taking for sites under development’.
- The WINEP of the Congresbury Yeo identified that due to minimal flow accretion downstream of the reservoir, particularly over the summer, reservoir outflow management has a more significant impact in terms of downstream flows, water quality and ultimately ecology than previously understood, which should be considered for this option.

2.4.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the River Chew and migratory fish using this watercourse.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability along the River Chew for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- Surveys to identify optimal lake conditions for supporting the non-breeding bird assemblage, including Northern shoveler and gadwall, to inform adaptive management of lake water depth.
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.
- Ecological response will continue to be monitored through regular macroinvertebrate survey to enable adaptive management, and this will be formalised on the abstraction licence as agreed by the end of AMP7.
- Monitor and identify opportunities for river restoration to enhance habitat value, including woody debris installation, flow deflectors, bank stabilisation, increased flow diversity, and re-meandering to improve floodplain connectivity post-reservoir construction.
- Impacts on physiochemical parameters to be confirmed following recommended further investigations.
- Specific responses of INNS to water quality changes in the River Chew is to be reviewed following any further water quality investigations.

2.5 BR-29: Chew Magna Reservoir - reduce compensation flow

2.5.1 SEA Summary Findings

No major negative effects have been identified for BR-29. A moderate negative effect has been identified for BR-29 for objectives 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought'*. This is due to the potential for the reduced compensation flow to decrease water quality and quantity downstream, which may result in the deterioration of waterbodies and reduced water quality within rivers such as the River Chew and Winford Brook.

A minor negative effect was identified for all biodiversity objectives due to the potential for reduced flows to negatively impact species and habitats that rely on the watercourse and due to the potential for an increase in INNS populations. Objective 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'* was also assessed as minor negative due to possible degradation of soils. Objective 4.2 '*Increase resilience to climate change risks and hazards'* also identified a minor negative effect due to a possible reduction in resilience to climate-related drought as river levels would be reduced.

For objectives 5 '*Protect and enhance the historic environment, including archaeology'*, 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustain water supplies for the local economy, including tourism, business and agriculture'*, a minor negative effect was also identified. A reduction in flow could impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions. In addition, visual amenity, recreational use and tourism activities such as fishing and kayaking associated with the River Chew and Winford Brook may be negatively impacted due to the reduction in water quantity and quality.

No major or moderate positive effects have been identified for BR-29. Minor positive effects were identified across both the population and human health objectives as well as objectives 1.1, 1.2, 2.2 and 5. This is related to retaining more water within the reservoir which may result in possible enhancements to designated sites, habitats, and species through making more water available during times of drought. Additionally, this could provide enhancements to the historic environment as the reservoir is a historic asset. Finally, retaining more water in the reservoir may also benefit visual amenity and recreation activities.

Objectives 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production*' identified a neutral effect. This is due to the option having no effect on flood risk as well as no construction works being required.

Option Ref	Biodiversity					Water				Soil	Climate		Historic Env		Population & Human Health				Material Assets
	1.1		1.2		1.3	2.1	2.2		2.3	3	4.1	4.2	5		6.1		6.2		7
BR-29	-	+	-	+	-	--	--	+	0	-	0	-	-	+	-	+	-	+	0

2.5.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Four Habitat Sites was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Chew Valley Lake SPA (approximately 1.6km south)	North Somerset and Mendip Bats SAC (approximately 7km south)
Severn Estuary SAC (approximately 18.8km west, 35.5km downstream)	Avon Gorge Woodlands SAC (approximately 9.4km north)

Potential for Significant Effects (AA required)	No Likely Significant Effects
Severn Estuary SPA (approximately 18.8km west, 35.5km downstream)	
Severn Estuary Ramsar (approximately 18.8km west, 35.5km downstream)	

Reduced downstream flow on the Winford Brook and River Chew may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites. Changes to the water level in Chew Magna Reservoir may alter habitat suitability, abundance and/or distribution of prey items which support qualifying features of the Chew Valley Lake SPA and Severn Estuary SPA.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the Winford Brook/River Chew meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the Severn Estuary SAC, Severn Estuary SPA, Severn Estuary Ramsar or Chew Valley Lake SPA. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08MU100151) and the production of an EAR.

2.5.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB40902G804800: Bristol Triassic	GB109053021900: Winford Bk - source to conf R Chew
	GB109053021950: Chew - conf Winford Bk to conf R Avon (Brist)

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109053021900	Winford Bk - source to conf R Chew	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)
GB109053021950	Chew - conf Winford Bk to conf R Avon (Brist)	Low / Low	No	No	No	1 (minor localised impact)

Winford Bk - source to conf R Chew was identified as less than good status for fish with abstraction related RNAGs due to regulating reservoir flow regime, therefore, a benefit could potentially be seen to fish populations if compensation flows are reduced. Chew – conf Winford Bk to conf R Avon (Brist) was identified as less than good status for Macrophytes and Phytobenthos but due to reasons other than abstraction. The Level 2 assessment identified the impact score as moderate negative both pre and post-mitigation for the watercourse with a low confidence in WFD data and option design. There is also a possible deterioration between status classes, possible impediments to GES / GEP, and possible compromises to water body objectives.

For the Chew – conf Winford Bk to conf R Avon, a minor negative effect was identified both pre and post-mitigation. The option is not expected to result in deterioration between status classes, possible impediments to GES/GEP, or possible compromises to water body objectives.

2.5.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment was required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

There are no recorded INNS at Chew Magna Reservoir, however, there is the potential that Zebra mussels, Rainbow trout and Brook charr may be present as they were recorded as present in an upstream channel connected to the reservoir. Decreasing compensation flows by up to 50% is not likely to increase the spread of INNS into this reservoir.

The INNS identified as present within Winford Brook are Zebra mussels, Rainbow trout, Brook charr, Jenkins' spire shell snail, and North American signal crayfish. It was unclear how these INNS would respond to the reduction in compensation flows. However, it was identified that the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following recommended further investigation.

2.5.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- During operation, monitoring of the water levels within Winford Brook should be undertaken should be undertaken to determine if further mitigation is required.
- Operational reductions in compensation flow must consider seasonal flows and will be restricted to periods when the flow within the Winford Brook/River Chew is sufficient to support this. A HOF above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.
- Operational reductions in compensation flow should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve FCS and GES.
- Lake levels should be maintained at an appropriate level for qualifying interest features of the Chew Valley Lake SPA and Severn Estuary SPA during the sensitive non-breeding periods.
- Recommendation for additional baseline collection and assessment to be undertaken at a more detailed stage to determine the additional potential effects on water-dependent heritage assets and water sensitive historic environments to be identified.
- Measures to ensure preservation of waterlogged environments, following advice and guidance such as Historic England 2016 'Preserving archaeological remains: Decision-taking for sites under development'.

2.5.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the River Chew and migratory fish using this watercourse.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability along the River Chew for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- Surveys to identify optimal lake conditions for supporting the non-breeding bird assemblage, including Northern shoveler and gadwall, to inform adaptive management of lake water depth (both Chew Magna and Chew Valley reservoirs).
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.
- Ecological response will continue to be monitored through regular macroinvertebrate survey to enable adaptive management, and this will be formalised on the abstraction licence as agreed by the end of AMP7.
- Monitor and identify opportunities for river restoration to enhance habitat value, including woody debris installation, flow deflectors, bank stabilisation, increased flow diversity, and re-meandering to improve floodplain connectivity post-reservoir construction.
- Volume reduction in compensation release needed.
- Impacts on physiochemical parameters to be confirmed following recommended further investigations.
- Specific responses of INNS to water quality changes in the River Chew is to be reviewed following any further water quality investigations.

2.6 BR-30: Cheddar Ponds - reduce compensation flow

2.6.1 SEA Summary Findings

No major negative effects have been identified within BR-30. A moderate negative effect has been identified for BR-30 for objectives 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*', 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought*'. This is due to the potential for a reduced compensation flow to deplete water quality and quantity downstream, which may affect aquatic habitats and species.

A minor negative effect was identified for objective 1.1 '*Protect and enhance designated ecological sites'* and 1.3 '*Reduce the spread or presence of INNS'* due to potential effects on designates sites such as the Severn Estuary SAC and Ramsar and for the potential increase in INNS species. A minor negative effect was also identified for objective 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance'* due to possible degradation of soils and for objective 4.2 '*Increase resilience to climate change risks and hazards*' due to a possible reduction in resilience to climate-related drought as river levels would be reduced.

For objectives 5 '*Protect and enhance the historic environment, including archaeology*', 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 6.2 '*Sustain water supplies for the local economy, including tourism, business and agriculture'*, a minor negative effect was also identified. A reduction in compensation flow could impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions. In addition, visual amenity, recreational use and tourism activities such as fishing and kayaking associated with the affected rivers, including the Cheddar Yeo may be negatively impacted due to the reduction in water quantity and quality within the river system.

No major or moderate positive effects have been identified for BR-30. Minor positive effects were identified across all biodiversity objectives, water objective 2.2, and both population and human health objectives. This is related to retaining more water within the reservoir which may result in possible enhancements to designated sites, habitats, and species through making more water available during times of drought. The option may also result in the reduction in the presence of INNS. Finally, retaining more water in the reservoir may also benefit visual amenity and recreation and tourism activities.

Objectives 2.3 '*Reduce flood risk'*, 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimise resource use and waste production'* were assessed as neutral effects. This is due to the option having no effect on flood risk as well as no construction works being required.

Option Ref	Biodiversity						Water				Soil	Climate		Historic Env	Population & Human Health				Material Assets
	1.1		1.2		1.3		2.1	2.2		2.3	3	4.1	4.2	5	6.1		6.2		7
BR-30	-	+	--	+	-	+	--	--	+	0	-	0	-	-	-	+	-	+	0

2.6.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Seven Habitat Sites was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
North Somerset and Mendip Bats SAC (adjacent to option)	Mendip Woodlands SAC (approximately 1.8km northwest)
Mendip Limestone Grasslands SAC (approximately 3.7km northwest)	
Severn Estuary SAC (approximately 15.7km west, 19km downstream)	

Potential for Significant Effects (AA required)	No Likely Significant Effects
Severn Estuary SPA (approximately 15.7km west, 19km downstream)	
Severn Estuary Ramsar (approximately 15.7km west, 19km downstream)	
Somerset Levels and Moors SPA (approximately 8.2km south)	
Somerset Levels and Moors Ramsar (approximately 8.2km south)	

Following review of the Stage 1 and the option details, potential adverse effects on the Severn Estuary SPA, Somerset Levels and Moors SPA and Ramsar, North Somerset and Mendip Bats SAC, and Mendip Limestone Grasslands SAC have been ruled out and therefore no mitigation is required to safeguard these designations.

The Severn Estuary SPA was originally screened in due to a previous assumption that the operation of this option, involving a reduction in compensation release from Cheddar Ponds to the Cheddar Yeo, would potentially have an effect on functionally linked floodplain habitats around the Cheddar Yeo and downstream River Axe. However, there is no available information to indicate that there is functionally linked habitat at these locations, nor that the option would result in measurable changes to terrestrial habitats in the floodplain.

Reduced downstream flow on the Cheddar Yeo and River Axe may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the Cheddar Yeo and River Axe meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08BW100020) and the production of an EAR.

2.6.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Two waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB40901G804600: Mendips	GB109052021540: Cheddar Yeo - source to conf River Axe
GB40902G804700: Wells	GB109052021570: Axe - Cocklake to Brean Cross Sluice

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109052021540	Cheddar Yeo - source to conf River Axe	Low / Low	Possible	Possible	No	2 (adverse impact – risk of deterioration)
GB109052021570	Axe - Cocklake to Brean Cross Sluice	Low / Low	No	No	No	1 (minor localised impact)

The Level 2 assessment identified that Cheddar Yeo – source to conf River Axe had a moderate adverse effect both pre and post mitigation with a low confidence in WFD data and option design. It is possible this watercourse has deterioration between status classes, possible impediments to GES / GEP, and also possible compromises to water body objectives. Furthermore, the assessment identified this watercourse does not assist the attainment of water body objectives.

Axe – Cocklake to Brean Cross Sluice, however, had a minor negative effect both pore and post mitigation with low confidence in WFD data and option design. This watercourse also has no potential for deterioration between status classes, has no impediments to GES / GEP, and does not compromise water body objectives. However, this waterbody does not assist the attainment of the water body objectives.

2.6.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A risk magnitude rating of zero was identified for INNS transfer, however a Level 2 SAI-RAT assessment was required to understand how habitat changes may affect INNS populations.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Reduce compensation flow	• No risk of transfer/movement of invasive or non-native species with this option type. • Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations.	No transfer	Periodical	None	0 = None

The INNS Level 2 assessment identified that there were no INNS records present in Cheddar Ponds, therefore, the spread of INNS has not been assessed. However, within the Cheddar Yeo there are nine INNS recorded as present which are: Jenkins' spire shell snail, shrimp, Nuttall's pondweed, Least duckweed, Canadian pondweed, Water Fern, Japanese knotweed Himalayan balsam, and Grass carp.

The assessment identified a positive response of Japanese Knotweed and Himalayan Balsam in the Cheddar Yeo in relation to the decrease in water flow velocity and wetted areas caused by reducing compensation flows. This leads to an increase in habitat, food, and foraging availability as well as aids dispersal and reproduction.

However, Nuttall's pondweed, Least duckweed, Canadian pondweed, and Water fern all had a possible negative response to the changes in the receptor habitat. Although the change in water velocity had a possible positive effect on habitat quality and reproduction, the decrease in wetted areas and water depth meant that there was less space for habitats and reproduction therefore reducing plant growth.

The other INNS had an unclear response in relation to reduced compensation flows potentially due to variable changes in relation to decreased water flow, wetted areas, and depth.

2.6.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of flows and abstraction to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational reductions in water bank release flow must consider seasonal flows and will be restricted to periods when the flow within the Congresbury Yeo is sufficient to support this. A HOF

above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.

- Operational reductions in flow should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve FCS and GES.
- Monitor the reduction in compensation flows to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Implement river restoration measures immediately downstream of where the loss in flow originates.
- Recommendation for additional baseline collection and assessment to be undertaken at a more detailed stage to determine the additional potential effects on water-dependent heritage assets and water sensitive historic environments to be identified.
- Measures to ensure preservation of waterlogged environments, following advice and guidance such as Historic England 2016 ‘Preserving archaeological remains: Decision-taking for sites under development’.

2.6.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the Cheddar Yeo and River Axe and migratory fish using these watercourses.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.
- Ecological response will continue to be monitored through regular macroinvertebrate survey to enable adaptive management, and this will be formalised on the abstraction licence as agreed by the end of AMP7.
- Monitor and identify opportunities for river restoration to enhance habitat value, including woody debris installation, flow deflectors, bank stabilisation, increased flow diversity, and re-meandering to improve floodplain connectivity post-reservoir construction.
- Impacts on physiochemical parameters to be confirmed following recommended further investigations.
- Specific responses of INNS to water quality changes to be reviewed following any further water quality investigations.

2.7 BR-31a: River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include October

2.7.1 SEA Summary Findings

No major negative effects have been identified within BR-31a. A moderate negative effect has been identified for BR-31a for objective 1.3 '*Reduce the spread or presence of INNS'*. This is due to the potential for the option to result in an increase in INNS populations.

A minor negative effect was identified for objectives 1.1 '*Protect and enhance designated ecological sites'* and 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*' due to the option having potential effects on designates sites, species and habitats as a result of reduced flows. A minor negative effect was also identified for objectives 2.1 '*Protect and enhance the quality of the water environment and water resources*' and 2.2 '*Provide a sustainable water supply in times of drought'* due to lower flows affecting water quality and availability downstream. A minor negative effect was also identified for objectives 4.1 '*Reduce embodied and operational carbon emissions*' and 4.2 '*Increase resilience to climate change risks and hazards'* due to a possible increase in carbon emissions and reduction in resilience to climate-related drought as river levels would be reduced.

No major or moderate positive effects have been identified for BR-31a. Objectives 1.1 and 1.2 were assessed as having a minor positive effect due to more water being retained in Cheddar Reservoir, resulting in possible enhancements to habitats and species. Minor positive effects were also identified across all water objectives and both population and human health objectives. This is due to the option helping to sustain water supplies to Chedder Reservoir, positively impacting water quality, potentially reducing flood risk downstream and supporting water-based businesses and agriculture during times of drought. Furthermore, storing more water at Cheddar Reservoir may positively affect visual amenity and recreational activities during a drought period. Objective 4.2 also identified a minor positive effect due to increased resilience to climate change related to the storage of water.

Neutral effects were also identified, related to the option involving minimal resource use and not requiring any construction works.

Option Ref	Biodiversity					Water					Soil	Climate			Historic Env	Population & Human Health		Material Assets
	1.1		1.2		1.3	2.1		2.2		2.3	3	4.1		4.2	5	6.1	6.2	7
BR-31a	-	+	-	+	--	-	+	-	+	+	0	-	-	+	0	+	+	0

2.7.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Seven Habitat Sites was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Mendip Limestone Grasslands SAC (approximately 1.8km northwest)	Mendip Woodlands SAC (approximately 1.6km north)
North Somerset and Mendip Bats SAC (approximately 2.5km northeast)	
Severn Estuary SAC (approximately 13.2km west, 13.8km downstream)	
Severn Estuary SPA (approximately 13.2km west, 13.8km downstream)	
Severn Estuary Ramsar (approximately 13.2km west, 13.8km downstream)	

Potential for Significant Effects (AA required)	No Likely Significant Effects
Somerset Levels and Moors SPA (approximately 7.5km south)	
Somerset Levels and Moors Ramsar (approximately 7.5km south)	

Following a review of the HRA screening and the option details, potential adverse effects on the Somerset Levels and Moors SPA and Ramsar, North Somerset and Mendip Bats SAC, and Mendip Limestone Grasslands SAC, have been ruled out. Therefore, these Habitats Sites have not been considered further with the AA, and no mitigation is required to safeguard their integrities.

Reduced downstream flow on the River Axe may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites. Changes to the water level in Cheddar Reservoir may alter habitat suitability, abundance and/or distribution of prey items which support qualifying features of the Severn Estuary SPA; the reservoir may be functionally linked to these sites for waterbirds associated with the SPA.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Axe meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08BW100020) and the production of an EAR.

2.7.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB109052021540: Cheddar Yeo - source to conf River Axe	GB109052021570: Axe - Cocklake to Brean Cross Sluice
GB30943348: Cheddar Reservoir	
GB40902G804700: Wells	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109052021570	Axe - Cocklake to Brean Cross Sluice	Low / Low	No	No	No	1 (minor localised impact)

The Level 2 assessment identified a minor negative effect both pre and post-mitigation with a low confidence in WFD data and option design. There is not expected to be a deterioration between status classes, impediments to GES / GEP or compromises to water body objectives. The watercourse does not assist with attainment of water body objectives.

2.7.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A moderate risk magnitude rating was identified and therefore a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Extend abstraction season	• Change in volume and timing of existing transfer between water bodies assumed already connected. • Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment	Periodical	Medium	4= Moderate

The Level 2 assessment identified one INNS record for Cheddar Reservoir; Nuttall's pondweed. An additional 10 INNS were identified as present in the River Axe, these are: Floating pennywort, Canadian pondweed, Bivalve, American skunk-cabbage, Sunbleak, Common Carp, Shrimp, Himalayan balsam, Jenkins' spire shell, and North American signal crayfish.

The assessment identified Himalayan balsam present within the River Axe had a positive response to an additional month of abstraction. This is likely due to a decrease in water flow which results in more stagnant/slow flowing water, therefore making it easier for plant growth. American skunk-cabbage had an unclear/possible positive response which is likely due to slower water flows, as with Himalayan balsam. The other INNS in the River Axe all had an unclear response to the additional month of abstraction, potentially due to variable reactions to changes in water quality, flows, wetted areas, and depths.

Cheddar Reservoir only identified Nuttall's pondweed within the waterbody, with potential for the INNS found in the River Axe. An unclear response to the extended season was identified for Cheddar Reservoir with the potential for the INNS to have a positive response from increased wetted areas and depth increasing habitat quality and helping reproduction.

2.7.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates abstraction to identify negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational abstraction must consider seasonal flows and will be restricted to periods when the flow within the River Axe is sufficient to support this. A HOF above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.
- Operational abstraction should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve FCS and GES.
- Lake levels should be maintained at an appropriate level for qualifying interest features of the Severn Estuary SPA during the sensitive non-breeding periods.
- Monitor the rates of abstraction during operation to ensure compliance with licence to avoid and mitigate negative effects on water resources.

2.7.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.

- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the River Axe and migratory fish using this watercourse.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability along the River Axe for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- Surveys to identify optimal lake conditions for supporting the non-breeding bird assemblage, to inform adaptive management of lake water depth (Cheddar reservoir).
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- Impacts on physiochemical parameters to be confirmed following recommended further investigations.
- Specific responses of INNS to water quality changes to be reviewed following any further water quality investigations.

2.8 B-31b: River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include May

2.8.1 SEA Summary Findings

No major negative effects have been identified within BR-31b. A moderate negative effect has been identified for BR-31b for objective 1.3 '*Reduce the spread or presence of INNS'*. This is due to the potential for the option to result in an increase in INNS populations.

A minor negative effect was identified for objectives 1.1 '*Protect and enhance designated ecological sites'* and 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*' due to the option having potential effects on designates sites, species and habitats as a result of reduced flows. A minor negative effect was also identified for objectives 2.1 '*Protect and enhance the quality of the water environment and water resources*' and 2.2 '*Provide a sustainable water supply in times of drought'* due to lower flows affecting water quality and availability downstream. A minor negative effect was also identified for objectives 4.1 '*Reduce embodied and operational carbon emissions*' and 4.2 '*Increase resilience to climate change risks and hazards'* due to a possible increase in carbon emissions and reduction in resilience to climate-related drought as river levels would be reduced.

For objectives 5 '*Protect and enhance the historic environment, including archaeology'* and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'*, a minor negative effect was also identified. A reduction in flow in May when water levels may be already lower than usual could impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions. In addition, visual amenity, recreational use and tourism activities such as fishing and kayaking associated with the River Axe may be negatively impacted due to the reduction in water quantity and quality.

No major or moderate positive effects have been identified for BR-31b. Objectives 1.1 and 1.2 identified a minor positive effect due to more water being retained in Cheddar Reservoir, resulting in possible enhancements to habitats and species. Minor positive effects were also identified for water objectives 2.1 and 2.3 '*Reduce flood risk'* and both population and human health objectives. This is due to the option helping to sustain water supplies to Chedder Reservoir, positively impacting water quality, potentially reducing flood risk downstream and supporting water-based businesses and agriculture during times of drought. Furthermore, storing more water at Cheddar Reservoir may positively affect visual amenity and recreational activities during a drought period. Objective 4.2 also identified a minor positive effect due to increased resilience to climate change related to the storage of water.

Neutral effects were also identified, related to the option involving minimal resource use and not requiring any construction works.

Option Ref	Biodiversity					Water				Soil	Climate			Historic Env	Population & Human Health			Material Assets
	1.1		1.2		1.3	2.1		2.2	2.3	3	4.1	4.2		5	6.1		6.2	7
BR-31b	-	+	-	+	--	-	+	-	+	0	-	-	+	-	-	+	+	0

2.8.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Seven Habitat Sites was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Mendip Limestone Grasslands SAC (approximately 1.8km northwest)	Mendip Woodlands SAC (approximately 1.6km north)
North Somerset and Mendip Bats SAC (approximately 2.5km northeast)	

Potential for Significant Effects (AA required)	No Likely Significant Effects
Severn Estuary SAC (approximately 13.2km west, 13.8km downstream)	
Severn Estuary SPA (approximately 13.2km west, 13.8km downstream)	
Severn Estuary Ramsar (approximately 13.2km west, 13.8km downstream)	
Somerset Levels and Moors SPA (approximately 7.5km south)	
Somerset Levels and Moors Ramsar (approximately 7.5km south)	

Following a review of the HRA screening and the option details, potential adverse effects on the Somerset Levels and Moors SPA and Ramsar, North Somerset and Mendip Bats SAC, and Mendip Limestone Grasslands SAC, have been ruled out. Therefore, these Habitats Sites have not been considered further with this Appropriate Assessment, and no mitigation is required to safeguard their integrities.

Reduced downstream flow on the River Axe may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites. Changes to the water level in Cheddar Reservoir may alter habitat suitability, abundance and/or distribution of prey items which support qualifying features of the Severn Estuary SPA; the reservoir may be functionally linked to these sites for waterbirds associated with the SPA.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Axe meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08BW100020) and the production of an EAR.

2.8.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB109052021540: Cheddar Yeo - source to conf River Axe	GB109052021570: Axe - Cocklake to Brean Cross Sluice
GB30943348: Cheddar Reservoir	
GB40902G804700: Wells	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109052021570	Axe - Cocklake to Brean Cross Sluice	Low / Low	No	No	No	1 (minor localised impact)

The Level 2 assessment identified a minor negative effect both pre and post-mitigation with a low confidence in WFD data and option design. There is not expected to be a deterioration between status classes, impediments to GES / GEP or compromises to water body objectives. The watercourse does not assist with attainment of water body objectives.

The WFD assessment also identified that Cheddar Yeo – source to conf River Axe had a less than good Macrophytes and Phytobenthos status for reasons other than abstraction and Axe – Cocklake to Brean Cross Sluice had less than good status for Macroinvertebrate status for reasons other than abstraction.

2.8.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A moderate risk magnitude rating was identified and therefore, a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Extend abstraction season	• Change in volume and timing of existing transfer between water bodies assumed already connected. • Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment	Periodical	Medium	4= Moderate

The Level 2 assessment identified one INNS as present in Cheddar Reservoir; Nuttall's pondweed. An additional 10 INNS were noted as recorded in the River Axe, these are: Floating pennywort, Canadian pondweed, Bivalve, American skunk-cabbage, Sunbleak, Common Carp, Shrimp, Himalayan balsam, Jenkins' spire shell, and North American signal crayfish.

The assessment identified Himalayan balsam present within the River Axe had a positive response to additional month of abstraction. This is likely due to a decrease in water flow which results in more stagnant/slow flowing water, therefore making it easier for plant growth. American skunk-cabbage had an unclear/possible positive response which is likely due to slower water flows, as with Himalayan balsam. The other INNS in the River Axe all had an unclear response to the additional month of abstraction, potentially due to variable reactions to changes in water quality, flows, wetted areas, and depths.

Cheddar Reservoir only identified Nuttall's pondweed within the waterbody, with potential for the INNS found in the River Axe. An unclear response to the extended season was identified for Cheddar Reservoir with the potential for the INNS to have a positive response from increased wetted areas and depth increasing habitat quality and helping reproduction.

2.8.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates abstraction to identify negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational abstraction must consider seasonal flows and will be restricted to periods when the flow within the River Axe is sufficient to support this. A HOF above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.
- Operational abstraction should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve FCS and GES.
- Lake levels should be maintained at an appropriate level for qualifying interest features of the Severn Estuary SPA during the sensitive non-breeding periods.
- Monitor the rates of abstraction during operation to ensure compliance with licence to avoid and mitigate negative effects on water resources.

2.8.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.
- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the River Axe and migratory fish using this watercourse.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability along the River Axe for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- Surveys to identify optimal lake conditions for supporting the non-breeding bird assemblage, to inform adaptive management of lake water depth (Cheddar reservoir).
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- Impacts on physiochemical parameters to be confirmed following recommended further investigations.
- Specific responses of INNS to water quality changes to be reviewed following any further water quality investigations.

2.9 BR-47: River Axe to Cheddar Reservoir - early commissioning of pumped storage abstraction

2.9.1 SEA Summary Findings

No major negative effects have been identified within BR-47. A moderate negative effect has been identified for BR-47 for objectives 1.3 '*Reduce the spread or presence of INNS*'. This is due to the potential for the option to result in an increase in INNS populations.

A minor negative effect was identified for objectives 1.1 '*Protect and enhance designated ecological sites'* and 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'* due to the option having potential effects on designates sites, species and habitats as a result of reduced flows. A minor negative effect was also identified for objectives 2.1 '*Protect and enhance the quality of the water environment and water resources'*, 2.2 '*Provide a sustainable water supply in times of drought'* and 2.3 '*Reduce flood risk'* due to lower flows affecting water quality and availability downstream. Somerset Levels Ramsar and SAC is partially characterised by the flooding which occurs during winter months. If water levels are significantly reduced and flooding occurs less due to earlier abstraction, this Ramsar and SAC could be negatively affected.

A minor negative effect was also identified for objectives 4.1 '*Reduce embodied and operational carbon emissions*' and 4.2 '*Increase resilience to climate change risks and hazards'* due to a possible increase in carbon emissions and reduction in resilience to climate-related drought as river levels would be reduced. Finally, a minor negative effect was identified for objective 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'*, due to the potential for visual amenity, recreational use and tourism activities such as fishing and kayaking associated with the River Axe to be negatively impacted due to the reduction in water quantity and quality.

No major or moderate positive effects have been identified for BR-47. Objectives 1.1 and 1.2 were assessed as a minor positive effect due to more water being retained in Cheddar Reservoir, resulting in possible enhancements to habitats and species. Minor positive effects were also identified across water objectives 2.2 and 2.3. This is due to the option helping to sustain water supplies to Chedder Reservoir, positively impacting water quality, potentially reducing flood risk downstream. Objective 4.2 also identified a minor positive effect due to increased resilience to climate change related to the storage of water.

Neutral effects were also identified, related to the option involving minimal resource use and not requiring any construction works.

Option Ref	Biodiversity					Water					Soil	Climate			Historic Env	Population & Human Health		Material Assets
	1.1		1.2		1.3	2.1	2.2		2.3		3	4.1	4.2		5	6.1	6.2	7
BR-47	-	+	-	+	--	-	-	+	-	+	0	-	-	+	0	-	0	0

2.9.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Seven Habitat Sites was screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
Mendip Limestone Grasslands SAC (approximately 1.8km northwest)	Mendip Woodlands SAC (approximately 1.6km north)
North Somerset and Mendip Bats SAC (approximately 2.5km northeast)	
Severn Estuary SAC (approximately 13.2km west, 13.8km downstream)	
Severn Estuary SPA (approximately 13.2km west, 13.8km downstream)	

Potential for Significant Effects (AA required)	No Likely Significant Effects
Severn Estuary Ramsar (approximately 13.2km west, 13.8km downstream)	
Somerset Levels and Moors SPA (approximately 7.5km south)	
Somerset Levels and Moors Ramsar (approximately 7.5km south)	

Following a review of the HRA screening and the option details, potential adverse effects on the Somerset Levels and Moors SPA and Ramsar, North Somerset and Mendip Bats SAC, and Mendip Limestone Grasslands SAC, have been ruled out. Therefore, these Habitats Sites have not been considered further with this Appropriate Assessment, and no mitigation is required to safeguard their integrities.

Reduced downstream flow on the River Axe may result in changes to habitat suitability for migratory fish associated with the Severn Estuary SAC and Ramsar sites. Changes to the water level in Cheddar Reservoir may alter habitat suitability, abundance and/or distribution of prey items which support qualifying features of the Severn Estuary SPA; the reservoir may be functionally linked to these sites for waterbirds associated with the SPA.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Axe meet the flow targets and therefore do not adversely affect migratory fish associated with the Severn Estuary SAC and Ramsar. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08BW100020) and the production of an EAR.

2.9.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB109052021540: Cheddar Yeo - source to conf River Axe	GB109052021570: Axe - Cocklake to Brean Cross Sluice
GB30943348: Cheddar Reservoir	
GB40902G804700: Wells	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB109052021570	Axe - Cocklake to Brean Cross Sluice	Low / Low	No	No	No	1 (minor localised impact)

The Level 2 assessment identified a minor negative effect both pre and post-mitigation with a low confidence in WFD data and option design. There is not expected to be a deterioration between status classes, impediments to GES / GEP or compromises to water body objectives. The watercourse does not assist with attainment of water body objectives.

2.9.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A moderate risk magnitude rating was identified and therefore, a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Extend abstraction season	• Change in volume and timing of existing transfer between water bodies assumed already connected. • Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations.	Transfer within WFD Operational Catchment	Periodical	Medium	4= Moderate

The Level 2 assessment identified records for one INNS in Cheddar Reservoir; Nuttall's pondweed. An additional 10 INNS were identified as present in the River Axe, these are: Floating pennywort, Canadian pondweed, Bivalve, American skunk-cabbage, Sunbleak, Common Carp, Shrimp, Himalayan balsam, Jenkins' spire shell, and North American signal crayfish.

The assessment identified Himalayan balsam present within the River Axe had a positive response to additional month of abstraction. This is likely due to a decrease in water flow which results in more stagnant/slow flowing water, therefore making it easier for plant growth. American skunk-cabbage had an unclear/possible positive response which is likely due to slower water flows, as with Himalayan balsam. The other INNS in the River Axe all had an unclear response to the additional month of abstraction, potentially due to variable reactions to changes in water quality, flows, wetted areas, and depths.

Cheddar Reservoir only identified Nuttall's pondweed within the waterbody, with potential for the INNS found in the River Axe. An unclear response to the extended season was identified for Cheddar Reservoir with the potential for the INNS to have a positive response from increased wetted areas and depth increasing habitat quality and helping reproduction.

2.9.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates abstraction to identify negative effects on water resources and habitats that are dependent on water quality and levels.
- Operational abstraction must consider seasonal flows and will be restricted to periods when the flow within the River Axe is sufficient to support this. A HOF above which no additional reductions may occur will be in place, in order to protect low flows during drought periods.
- Operational abstraction should be adjusted to meet the seasonal flow targets and may be constrained further to meet the requirements of qualifying interest features of the Severn Estuary SAC and Ramsar sites, in order to achieve FCS and GES.
- Lake levels should be maintained at an appropriate level for qualifying interest features of the Severn Estuary SPA during the sensitive non-breeding periods.
- Monitor the rates of abstraction during operation to ensure compliance with licence to avoid and mitigate negative effects on water resources.

2.9.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- There is an ongoing WINEP investigation associated with this waterbody. Findings of this should be considered through development of this option. This is expected to be incorporated into the more detailed EAR.
- Hydro-ecology studies and hydrodynamic modelling of seasonal flows to identify whether changes in water availability would have an adverse effect on the River Axe and migratory fish using this watercourse.
- A detailed review of baseline ecological data to determine gaps and additional surveys required; this may inform targeted mitigation. It is anticipated that additional data will be collected to identify habitat suitability along the River Axe for targeted migratory fish species, their spawning sites and specific migratory periods for this river.
- Surveys to identify optimal lake conditions for supporting the non-breeding bird assemblage, to inform adaptive management of lake water depth (Cheddar reservoir).
- A climate change scenario analysis is recommended to account for mid- and long-term effects which could be compounded through more frequent and intense droughts in the future.
- Impacts on physiochemical parameters to be confirmed following recommended further investigations.
- Specific responses of INNS to water quality changes to be reviewed following any further water quality investigations.

MOTT MACDONALD

SBB Drought Plan 2027

Appendix 9: Drought Option Summaries - Bournemouth

Project:	SBB Drought Plan 2027 Environmental Assessments		
Our reference:	100125254-MM-RP-SEA-018-B		
Prepared by:	I.N.	**Date:**	24/03/2026
Approved by:	K.M.	**Checked by:**	C.J.
Subject:	Drought Option Summaries – Bournemouth		

1 Bournemouth Drought Option Summaries

The below summaries provide an overview of the environmental assessments undertaken to date for the options within the Bournemouth Water Resource Zone (WRZ), in support of the South West Water, Bournemouth Water, and Bristol Water (SBB) Drought Plan 2027. This includes Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) assessment, Invasive Non-native Species (INNS) assessment, and the option-level Strategic Environmental Assessment (SEA), which incorporates wider environmental considerations such as effects on biodiversity, historic environment, soils and resources.

Further information including the full assessments can be found within the SEA Environmental Report and Technical Appendices. The option-level SEAs can be found within Annex H-N, and the Technical Appendices for HRA, WFD and INNS within Annex O-Q.

The Bournemouth options include:

- BN-04: River Stour at Longham - remove low flow constraint
- BN-05: Stanbridge boreholes – increase daily abstraction limit
- BN-12: River Stour at Longham - increase weekly abstraction limit

2 Bournemouth WRZ

2.1 BN-04: River Stour at Longham - remove low flow constraint

2.1.1 SEA Summary Findings

No major negative effects have been identified for option BN-04. A moderate negative effect has been identified for objective 1.3 '*Reduce the spread or presence of INNS*' due to the change in flow resulting in a possible increase of INNS populations in existing areas. A moderate negative effect has also been identified in relation to two water objectives, 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought*'. This relates to a reduction in water levels in the River Stour which may reduce water quality and prolong recovery periods, exacerbating impacts from drought.

Minor negative effects have been identified in relation to all other objectives, other than objective 2.3 '*Reduce flood risk'*, 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*, and 7 '*Minimise resource use and wate production'* which were either assessed as neutral or positive. The minor negative effects are largely attributed to the possible reduction in water quality and quantity downstream of the option, which may result in potential effects on designated sites such as the River Avon SAC, adverse effects on aquatic habitats and species, and possible degradation of soils. Visual amenity and recreation use, such as fishing and kayaking associated with the River Stour and River Allen, may be negatively affected due to the reduction in water quantity and quality within the river systems. The increased abstraction and reduction in flows within the river systems may also potentially increase the effects of climate-related droughts and increase the operational energy and associated carbon emissions. In addition, a reduction in water quantity could also impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions.

No major positive effects have been identified. A minor positive effect was identified for objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*. This is due to the option providing water supply to water-based tourism businesses in times of drought. A minor positive effect was also identified for objective 1.3, due to a reduction in INNS population fitness from the decrease in wetted areas and water depth.

Neutral effects were identified in relation to objectives 2.3 and 7, due to the option having minimal flood risk and not requiring construction works.

Option Ref	Biodiversity				Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3		2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
BN-04	-	-	--	+	--	--	0	-	-	-	-	-	+	0

2.1.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Two Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
River Avon SAC (approximately 7.7km east, 17km downstream)	Dorset Heaths SAC (approximately 1.1km south)
Solent and Dorset Coast SPA (approximately 7.1km southeast, 15.5km downstream)	Dorset Heathlands SPA (approximately 2.2km west)
	Dorset Heathlands Ramsar (approximately 1.1km south)

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Avon Valley SPA (approximately 7.3km east, 17km downstream)
	Avon Valley Ramsar (approximately 7.3km east, 17km downstream)
	Poole Harbour SPA (approximately 7.4km south)
	Poole Harbour Ramsar (approximately 7.4km south)

The HRA identified likely significant effects for the River Avon SAC and Solent and Dorset Coast SPA due to increased abstraction from the River Stour (as a result of removing the low flow constraint), which has the potential to result in reduced downstream flow on the River Stour. This may result in changes to habitat suitability for migratory fish associated with the River Avon SAC.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Stour meet the flow targets and therefore do not adversely affect Atlantic salmon associated with the River Avon SAC and indirect affect qualifying species of the Solent and Dorset Coast SPA. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the integrity of either the River Avon SAC, or the Solent and Dorset Coast SPA. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08SW100061 and 08SW100067a) and the production of an EAR.

2.1.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB520804315900: CHRISTCHURCH HARBOUR	GB108043011040: Stour (Lower)
GB40802G805800: Lower Dorset Stour and Lower Hampshire Avon	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108043011040	Stour (Lower)	Low / Low	Possible	Possible	No	2 (moderate adverse impact – risk of deterioration)

The Level 2 WFD assessment identified that there is a possible deterioration between status classes, impediments to Good Ecological Status (GES) or Good Ecological Potential (GEP), and compromises to water body objectives for Stour (Lower). This primarily due to changes in flow and velocity as a result of temporary pumps at Longham. Localised changes in flow and velocity could lead to a change in sedimentation deposition in localised areas particularly at and around the abstraction point. The reduction in water downstream of the abstraction point could reduce the dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants.

Increased abstraction would likely further reduce river flows during drought conditions, which may prolong recovery periods post-drought back to typical baseline conditions. The assessment concluded a moderate negative effect both pre and post mitigation.

2.1.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A moderate risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Increase abstraction volume (relative to baseline) - temporary	• Change in volume and timing of existing transfer between water bodies assumed already connected. • Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations.	Transfer within WFD waterbody	Periodical	Medium	4 = Moderate

The INNS Level 2 assessment identified 13 INNS recorded as present within the River Stour, including Common Carp, Least duckweed, Himalayan balsam, Jenkins' spire shell, Crangonyx pseudogracilis, Physa acuta, Nuttall's pondweed, Canadian pondweed, Water Fern, Giant knotweed, Giant hogweed, Rainbow trout, and Orange balsam. The assessment concluded that the option may result in a decrease in average flow velocity, decrease in wetted area, decrease in average depth and decrease in water quality. However, only the change in flow is likely to result in an increase in INNS population fitness due to an increase in viable habitat. In contrast, the reduction in wetted area and decrease in water depth is likely to decrease the INNS population fitness by decreasing space for growth.

2.1.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Operate to seasonal flow targets with a defined hands-off flow (HOF), suspending or reducing pumping when thresholds are met, to protect low-flow/drought conditions and Atlantic salmon migration requirements linked to the River Avon SAC.
- Continuous water-quality monitoring (including aluminium) and adaptive management of weekly abstraction to maintain downstream dilution and habitat conditions in the Stour/Christchurch Harbour system.
- Targeted river restoration downstream to offset reduced flow effects: weir modification/removal, fish passes, and native riparian/in-channel planting; design modifications to existing weirs to improve hydromorphology without enlarging channel footprint.
- Strict licence-compliance monitoring of weekly and daily abstraction to protect WFD objectives and water-sensitive habitats/recreation.
- INNS management via best-practice biosecurity and abstraction controls to limit fitness advantages from reduced velocities.
- Use of clean/renewable energy where additional temporary pumping is required to reduce operational carbon.

2.1.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology and hydrodynamic/hydrological modelling to quantify weekly-limit changes on seasonal flows, habitat suitability, and Atlantic salmon migratory cues.

- Baseline ecological surveys and gap analysis (including migration timing/proportions) to refine abstraction rules and mitigation for SAC/SPA linkages.
- Water-quality risk mapping to identify contaminant hotspots and seasonality; link to adaptive weekly-abstraction operations.
- WFD Level 2 assessment confidence – further surveys/modelling for Stour (Lower) given identified risks of status deterioration and impediments to GES/GEP under temporary pumps.
- Climate-change scenario testing for compounding drought frequency/severity and recovery times; integrate results into operating rules.
- Embed ongoing WINEP findings.

2.2 BN-05: Stanbridge boreholes – increase daily abstraction limit

2.2.1 SEA Summary Findings

No major negative effects have been identified in relation to BN-05. A moderate negative effect has been identified in relation to two water objectives, 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought*'. This relates to a reduction in water levels in the Stour which may reduce water quality and prolong recovery periods, exacerbating impacts from drought.

Minor negative effects have been identified in relation to all other objectives, other than objective 2.3 '*Reduce flood risk'*, 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*, and 7 '*Minimise resource use and wate production'* which were either assessed as neutral or positive. The minor negative effects are largely attributed to the possible reduction in water quality and quantity downstream of the option, which may result in potential effects on designated sites such as the River Avon SAC, adverse effects on aquatic habitats and species, increased INNS populations, and possible degradation of soils. Visual amenity and recreation use, such as fishing and kayaking associated with the River Stour and River Allen, may be negatively affected due to the reduction in water quantity and quality within the river systems. The increased abstraction and reduction in flows within the river systems may also potentially increase the effects of climate-related droughts and increase the operational energy and associated carbon emissions. In addition, a reduction in water quantity could also impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions.

No major positive effects have been identified. A moderate positive effect was identified for objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*. This is due to the option having a substantial deployable output benefit, which could provide a prolonged water supply to water-based tourism businesses in times of drought. A minor positive effect was also identified for objective 1.3 due to a reduction in INNS population fitness from the decrease in wetted areas and water depth.

Neutral effects were identified for all options in relation to objectives 2.3 and 7, due to the option having minimal flood risk and not requiring construction works.

Option Ref	Biodiversity				Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3		2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
BN-05	-	-	-	+	--	--	0	-	-	-	-	-	++	0

2.2.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Two Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
River Avon SAC (approximately 7.7km east, 17km downstream)	Dorset Heaths SAC (approximately 1.1km south)
Solent and Dorset Coast SPA (approximately 7.1km southeast, 15.5km downstream)*	Dorset Heathlands SPA (approximately 2.2km west)
	Dorset Heathlands Ramsar (approximately 1.1km south)
	Avon Valley SPA (approximately 7.3km east, 17km downstream)
	Poole Harbour SPA (approximately 7.4km south)
	Poole Harbour Ramsar (approximately 7.4km south)

**The HRA screening identified no LSE alone in relation to the Solent and Dorset Coast SPA, but the presence of impact pathways and low-level effects have the potential to be exacerbated by other options in the Plan (BN-04 and BN-12), and/or with other plans and projects.*

The HRA identified likely significant effects for the River Avon SAC due to reduced downstream flow on the River Allen, which may result in changes to habitat suitability for migratory fish associated with the River Avon SAC (migrating up the River Stour).

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Stour meet the flow targets and therefore do not adversely affect Atlantic salmon associated with the River Avon SAC and indirect affect qualifying species of the Solent and Dorset Coast SPA. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the integrity of either the River Avon SAC, or the Solent and Dorset Coast SPA. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08SW100061 and 08SW100067a) and the production of an EAR.

2.2.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. Three waterbodies were identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
N/A	• GB108043015790:Allen (Headwaters) • GB108043011090:Allen (Lower) • GB40801G804500:Upper Dorset Stour

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108043015790	Allen (Head waters)	Low/Low	Possible	No	No	2 (moderate adverse impact – risk of deterioration)
GB108043011090	Allen (Lower)	Low/Low	Possible	No	No	2 (moderate adverse impact – risk of deterioration)
GB40801 G804500	Upper Dorset Stour	Low/Low	Possible	No	No	2 (moderate adverse impact – risk of deterioration)

All three waterbodies as required a Level 2 WFD assessment, due to impacts associated with increased groundwater abstraction, potentially leading to effects on the local watercourse, especially considering the chalk stream status in the Stour catchment.

The Level 2 assessment concluded a moderate adverse effect both pre and post-mitigation for all three waterbodies, with a possible deterioration between status classes and impediments GES / GEP.

2.2.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A very low risk magnitude rating was identified. Therefore, a Level 2 SAI-RAT assessment was not required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Groundwater source	• Very limited risk as the source water is likely to be entirely free of INNS. It is assumed that groundwater is free of INNS, and that accessing it will not permit any additional inputs of INNS.	Transfer within WFD waterbody	Periodical	Very Low	1 = Very Low

2.2.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Real-time monitoring of groundwater abstraction and levels to remain within licence and avoid adverse drawdown effects on the River Allen (chalk stream) and dependent habitats.
- Apply seasonal flow/HOF-style operational constraints so that increased groundwater abstraction does not compromise River Stour/Allen flow regimes during sensitive low-flow periods.
- Deliver catchment-based river restoration where needed (e.g., at Allen/Stour reaches influenced by borehole operation): weir modification/removal, fish passes, and riparian/in-channel planting to support habitat and water-quality resilience.
- INNS best-practice controls (even though risk from groundwater source is low) to ensure operational activities do not indirectly increase spread via altered flows or site practices.
- Monitor soil stability risk potentially associated with local groundwater table changes; adjust abstraction rates if monitoring indicates subsidence risk.
- Consider low-carbon energy for any additional pumping during temporary drought operation to limit operational emissions.

2.2.6 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- WFD Level 2 evidence strengthening for Allen (Headwaters/Lower) and Upper Dorset Stour through hydrological modelling and additional hydroecology/hydromorphology/aquatic surveys; current assessment indicates moderate adverse with potential deterioration/impediments to GES/GEP.
- Baseline ecological data gaps for Atlantic salmon use of the Stour/Allen system and local priority habitats near the boreholes; targeted surveys to define thresholds and seasonal sensitivities.
- Water-quality interactions under drought (reduced dilution) and sensitivity of salmonids (e.g., aluminium) in Allen/Stour; need for monitoring design to support adaptive operation.
- Climate-resilience appraisal of increased groundwater abstraction on catchment-scale low-flow recovery and ecosystem function.
- Embed ongoing WINEP findings.

2.3 BN-12: River Stour at Longham - increase weekly abstraction limit

2.3.1 SEA Summary Findings

No major negative effects have been identified for option BN-04. A moderate negative effect has been identified for objective 1.3 '*Reduce the spread or presence of INNS*' due to the change in flow resulting in a possible increase of INNS populations in existing areas. A moderate negative effect has also been identified in relation to two water objectives, 2.1 '*Protect and enhance the quality of the water environment and water resources'* and 2.2 '*Provide a sustainable water supply in times of drought*'. This relates to a reduction in water levels in the River Stour which may reduce water quality and prolong recovery periods, exacerbating impacts from drought.

Minor negative effects have been identified in relation to all other objectives, other than objective 2.3 '*Reduce flood risk'*, 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*, and 7 '*Minimise resource use and wate production'* which were either assessed as neutral or positive. The minor negative effects are largely attributed to the possible reduction in water quality and quantity downstream of the option, which may result in potential effects on designated sites such as the River Avon SAC, adverse effects on aquatic habitats and species, and possible degradation of soils. Visual amenity and recreation use, such as fishing and kayaking associated with the River Stour and River Allen, may be negatively affected due to the reduction in water quantity and quality within the river systems. The increased abstraction and reduction in flows within the river systems may also potentially increase the effects of climate-related droughts and increase the operational energy and associated carbon emissions. In addition, a reduction in water quantity could also impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions.

No major positive effects have been identified. A moderate positive effect was identified for objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'*. This is due to the option having a substantial deployable output benefit, which could provide a prolonged water supply to water-based tourism businesses in times of drought. A minor positive effect was also identified for objective 1.3 due to a reduction in INNS population fitness from the decrease in wetted areas and water depth.

Neutral effects were identified in relation to objectives 2.3 and 7, due to the option having minimal flood risk and not requiring construction works.

Option Ref	Biodiversity				Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3		2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
BN-12	-	-	--	+	--	--	0	-	-	-	-	-	++	0

2.3.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. Two Habitats Sites were screened in for progression to the Stage 2 Appropriate Assessment (AA):

Potential for Significant Effects (AA required)	No Likely Significant Effects
River Avon SAC (approximately 7.7km east, 17km downstream)	Dorset Heaths SAC (approximately 1.1km south)
Solent and Dorset Coast SPA (approximately 7.1km southeast, 15.5km downstream)	Dorset Heathlands SPA (approximately 2.2km west)
	Dorset Heathlands Ramsar (approximately 1.1km south)
	Avon Valley SPA (approximately 7.3km east, 17km downstream)

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Avon Valley Ramsar (approximately 7.3km east, 17km downstream)
	Poole Harbour SPA (approximately 7.4km south)
	Poole Harbour Ramsar (approximately 7.4km south)

The HRA identified likely significant effects for the River Avon SAC and Solent and Dorset Coast SPA due to increased abstraction from the River Stour (as a result of removing the low flow constraint) has the potential to result in reduced downstream flow on the River Stour, which may result in changes to habitat suitability for migratory fish associated with the River Avon SAC.

The HRA AA concludes that in principle, appropriate mitigation should be sufficient to ensure that conditions within the River Stour meet the flow targets and therefore do not adversely affect Atlantic salmon associated with the River Avon SAC and indirect affect qualifying species of the Solent and Dorset Coast SPA. However, at this stage of assessment and with the information currently available, it is currently not possible to rule out adverse effects on the integrity of either the River Avon SAC, or the Solent and Dorset Coast SPA. Additional assessments are required to inform targeted mitigation and conclusions which could rule out adverse effects, including ongoing WINEP actions (ID 08SW100061 and 08SW100067a) and the production of an EAR.

2.3.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
GB520804315900:CHRISTCHURCH HARBOUR	GB108043011040:Stour (Lower)
GB40802G805800:Lower Dorset Stour and Lower Hampshire Avon	

A WFD Level 2 assessment was undertaken based on the currently available information and the findings are as follows:

Water body ID	Water body name	Confidence in WFD data and option design	Deterioration between status classes	Compromises water body objectives	Assists attainment of water body objectives	Post mitigation impact score
GB108043011040	Stour (Lower)	Low / Low	Possible	Possible	No	2 (moderate adverse impact – risk of deterioration)

The Level 2 WFD assessment identified that there is a possible deterioration between status classes, impediments to GES / GEP, and compromises to water body objectives for Stour (Lower). This primarily due to changes in flow and velocity as a result of temporary pumps at Longham. Localised changes in flow and velocity could lead to a change in sedimentation deposition in localised areas particularly at and around the abstraction point. The reduction in water downstream of the abstraction point could reduce the dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants.

Increased abstraction would likely further reduce river flows during drought conditions, which may prolong recovery periods post-drought back to typical baseline conditions. The assessment concluded a moderate negative effect both pre and post mitigation.

2.3.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A moderate risk magnitude rating was identified, meaning that a further Level 2 SAI-RAT assessment was required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Increase abstraction volume (relative to baseline) - temporary	• Change in volume and timing of existing transfer between water bodies assumed already connected. • Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations.	Transfer within WFD waterbody	Periodical	Medium	4 = Moderate

The INNS Level 2 assessment identified 13 INNS recorded as present within the River Stour which includes Common Carp, Least duckweed, Himalayan balsam, Jenkins' spire shell, Crangonyx pseudogracilis, Physa acuta, Nuttall's pondweed, Canadian pondweed, Water Fern, Giant knotweed, Giant hogweed, Rainbow trout, and Orange balsam. The assessment concluded that the option may result in a decrease in average flow velocity, decrease in wetted area, decrease in average depth and decrease in water quality. However, only the change in flow is likely to result in an increase in INNS population fitness due to an increase in viable habitat. In contrast, the reduction in wetted area and decrease in water depth is likely to decrease the INNS population fitness by decreasing space for growth.

2.3.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Operate to seasonal flow targets with a defined HOF, suspending or reducing pumping when thresholds are met, to protect low-flow/drought conditions and Atlantic salmon migration requirements linked to the River Avon SAC.
- Continuous water-quality monitoring (including aluminium) and adaptive management of weekly abstraction to maintain downstream dilution and habitat conditions in the Stour/Christchurch Harbour system.
- Targeted river restoration downstream to offset reduced flow effects: weir modification/removal, fish passes, and native riparian/in-channel planting; design modifications to existing weirs to improve hydromorphology without enlarging channel footprint.
- Strict licence-compliance monitoring of weekly and daily abstraction to protect WFD objectives and water-sensitive habitats/recreation.
- INNS management via best-practice biosecurity and abstraction controls to limit fitness advantages from reduced velocities/wetted area.
- Use of clean/renewable energy where additional temporary pumping is required to reduce operational carbon.

2.3.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- Hydro-ecology and hydrodynamic/hydrological modelling to quantify weekly-limit changes on seasonal flows, habitat suitability, and Atlantic salmon migratory cues.

- Baseline ecological surveys and gap analysis (incl. migration timing/proportions) to refine abstraction rules and mitigation for SAC/SPA linkages.
- Water-quality risk mapping to identify contaminant hotspots and seasonality; link to adaptive weekly-abstraction operations.
- WFD Level 2 assessment confidence – further surveys/modelling for Stour (Lower) given identified risks of status deterioration and impediments to GES/GEP under temporary pumps.
- Climate-change scenario testing for compounding drought frequency/severity and recovery times; integrate results into operating rules.
- Embed ongoing WINEP findings.

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SBB Drought Plan 2027

Appendix 9: Drought Option Summaries – Isles of Scilly

Project:	SBB Drought Plan 2027 Environmental Assessments		
Our reference:	100125254-MM-RP-SEA-021-B		
Prepared by:	I.N.	**Date:**	24/03/2026
Approved by:	K.M.	**Checked by:**	C.J.
Subject:	Drought Option Summaries – Isles of Scilly WRZ		

1 Isles of Scilly Drought Option Summaries

The below summaries provide an overview of the environmental assessments undertaken to date for the options within the Isles of Scilly Water Resource Zone (WRZ), in support of the South West Water, Bournemouth Water, and Bristol Water (SBB) Drought Plan 2027. This includes Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) assessment, Invasive Non-native Species (INNS) assessment, and the option-level Strategic Environmental Assessment (SEA), which incorporates wider environmental considerations, such as effects on biodiversity, historic environment, soils, and resources.

Further information including the full assessments can be found within the SEA Environmental Report and Technical Appendices. The option-level SEAs can be found within Annex H-N, and the Technical Appendices for HRA, WFD and INNS within Annex O-Q.

The IoS options include:

- IS-18: St Martins - increase abstraction from boreholes to greater than 20m3/d

2 Isles of Scilly WRZ

2.1 IS-18: St Martins - increase abstraction from boreholes to greater than 20m3/d

2.1.1 SEA Summary Findings

No major negative effects have been identified for option IS-18. Moderate negative effects have been identified in relation to objective 2.2 '*Provide a sustainable water supply in times of drought'* as the option will reduce water availability in the natural system when groundwater levels are already anticipated to be low, compromising the resilience of the water environment.

A minor negative effect has been identified in relation to objectives 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites*', 2.1 '*Protect and enhance the quality of the water environment and water resources'*, 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance*', 4.1 '*Reduce embodied and operational carbon emissions*', 4.2 '*Increase resilience to climate change risks and hazards*' and 5 '*Protect and enhance the historic environment, including archaeology*'. Minor negative effects are largely attributed to the possible reduction in water quality and quantity as a result of the option, resulting in possible adverse effects on aquatic habitats and species, and possible degradation of soils. Further minor negative effects are likely to result due to an increase in operational energy use and associated carbon emissions due to the pumping and distribution of additional abstracted water. The reduction in groundwater levels may also increase the effects of climate-related droughts. In addition, a reduction in water quantity could also impact the preservation of buried archaeological and paleoenvironmental deposits that rely on water-saturated conditions.

No major or moderate positive effects have been identified in relation to IS-18. Minor positive effects have been identified in relation to objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture'.* This is due to the option helping to sustain a level of water supply during a drought period, which will benefit local businesses and tourism which is especially important on the Isles of Scilly where there is a substantial increase in tourism in summer months.

Neutral effects were identified for the remaining objectives, due to the option not affecting designated sites, not resulting in the spread of INNS, having minimal impact on flood risk, not affecting health, wellbeing or visual amenity, and not requiring any new infrastructure or construction. Neutral effects were identified for objectives 1.1 '*Protect and enhance designated ecological sites',* 1.3 '*Reduce the spread of INNS'*, 2.3 '*Reduce flood risk'*, 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity*' and 7 '*Minimal resource use and waste production'*.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
IS-13	0	-	0	-	--	0	-	-	-	-	0	+	0

2.1.2 HRA Summary Findings

An HRA Test of Likely Significance screening was conducted for the option. During the screening, no likely significant effects were identified for any of the habitats sites listed below. As such, progression to the Stage 2 Appropriate Assessment was not required.

Potential for Significant Effects (AA required)	No Likely Significant Effects
N/A	Isles of Scilly Complex SAC (approximately 0.2km west)
	Isles of Scilly SPA (approximately 0.1km west)

Potential for Significant Effects (AA required)	No Likely Significant Effects
	Isles of Scilly Ramsar (approximately 0.5km west)

2.1.3 WFD Summary Findings

A WFD Level 1 assessment was carried out for the option, with results presented in the table below. One waterbody was identified as requiring further WFD Level 2 assessment.

Waterbodies passing WFD Level 1 assessment	Waterbodies requiring further WFD Level 2 assessment
N/A	GB40802G081200: Isles of Scilly

Due to programme constraints, a WFD Level 2 assessment has not yet been undertaken for this option. This will be undertaken as the programme progresses.

2.1.4 INNS Summary Findings

A Level 1 INNS screening was undertaken for the option, with findings presented in the table below. A very low risk magnitude rating was identified. Therefore, a level 2 SAI-RAT assessment was not required.

Option type	Description of risks/impacts	Catchment connectivity	Frequency of Impact rating	Severity of Impact rating	Risk Magnitude rating
Groundwater source	• Very limited risk as the source water is likely to be entirely free of INNS. It is assumed that groundwater is free of INNS, and that accessing it will not permit any additional inputs of INNS.	Unconfirmed	Periodical	Very Low	1 = Very Low

2.1.5 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Monitor the rates of abstraction during operation to avoid and mitigate negative effects on designated sites.
- Monitor the rates of abstraction during operation to avoid and mitigate negative effects on water resources and habitats that are dependent on water quality and levels.
- Although the spread of INNS is unlikely for this option, it is assumed that best practice will be in place for the management and avoidance of INNS transfer.
- Implement a groundwater level monitoring before and during abstraction to detect any significant changes in the water table.
- Review the existing energy supply to seek opportunities for renewable sources.
- Assess the potential impacts of climate change within the area and implement best practice in order to mitigate against these.

2.1.6 Uncertainties & Further Work

This option will undergo further detailed assessment as part of the development of the EAR and drought permit application. At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- WFD Level 2 Assessment.
- Volumes of water supply during a drought period are currently unknown.

MOTT MACDONALD

SBB Drought Plan 2027

Appendix 9: Drought Option Summaries – Demand

Project:	SBB Drought Plan 2027 Environmental Assessments		
Our reference:	100125254-MM-RP-SEA-024-B		
Prepared by:	I.N., E.E.	**Date:**	24/03/2026
Approved by:	K.M.	**Checked by:**	C.J.
Subject:	Drought Option Summaries – Demand Options		

1 Demand Option Summaries

The below summaries provide an overview of the Strategic Environmental Assessments (SEA) undertaken for the demand options identified for inclusion within the South West Water, Bournemouth Water, and Bristol Water (SBB) Drought Plan 2027.

Further information including the full assessments can be found within the SEA Environmental Report and Technical Appendices.

The demand options include:

- D-01: Customer Communications
- D-02: Water Saving Devices
- D-03: Reward through billing
- D-04: Customer-Side Leakage
- D-05: Active Leakage Control
- D-06: Pressure Management
- D-07: Temporary Use Bans
- D-08: Non-Essential Use Bans

2 Demand options

2.1 D-01 – Customer Communications

2.1.1 SEA Summary Findings

No negative effects were identified in relation to D-01.

No major or moderate positive effects were identified in relation to D-01. Minor positive effects were identified for objectives 2.2 '*Provide a sustainable water supply in times of* drought' and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity.'* This is because the option aims to reduce the use of water, meaning more water will be retained in the environment during a period of drought and therefore provide a more sustainable water supply. Furthermore, reducing water consumption may help customers save money in the long-term, as well as potentially benefitting wellbeing and health through providing examples of how to cool down during hot weather further benefitting the community.

Neutral effects were identified for all the remaining objectives due to demand options having minimal effect on the natural environment. Although generally, demand options may offer improvements through retaining more water in the natural environment which may benefit habitats, species, water quality and reduced operational carbon emissions, effects are not considered to be significant, therefore overall, neutral effects were identified for most objectives.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
D-01	0	0	0	0	+	0	0	0	0	0	+	0	0

2.1.2 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Coordinate messaging across all communication levels so that drought-stage information is clear, consistent and timed to coincide with operational drought triggers.
- Tailor communications for specific audiences (e.g. high-use groups, Priority Services Register customers) to maximise engagement while maintaining accessibility and clarity.
- Ensure communication materials encourage water efficiency without creating unintended demand increases (e.g. peak-time usage shifts).
- Integrate messaging with other demand-side measures (e.g. water-saving devices, leakage reduction) to reinforce cumulative water-saving outcomes.
- Maintain appropriate data-protection measures when using customer insight tools to target communications to localised areas.
- Undertake regular monitoring of engagement metrics to refine messaging and improve effectiveness during future drought conditions.

2.1.3 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- The scale of water savings is dependent on customer engagement and may vary significantly across different demographic, geographic and socio-economic groups.

- Lack of baseline behavioural data may limit the ability to quantify the contribution of communication measures to overall drought-saving outcomes.
- Interactions with other drought measures (e.g. TUBs, NEUBs and leakage activity) may make it difficult to isolate the effect of communication campaigns.
- Further research is required on message framing, frequency and media channels that produce the most sustained behavioural change in water efficiency.
- Additional insight is needed on communication effectiveness in areas with lower levels of metering, where consumption feedback to customers is limited.
- Future assessments should incorporate findings from ongoing behavioural trials and regional drought-communication evaluation programmes.

2.2 D-02 – Water Saving Devices

2.2.1 SEA Summary Findings

No major or moderate negative effects were identified in relation to D-02. A minor negative effect was identified for objective 4.1 '*Reduce embodied and operational carbon emissions.'* This is due to the potential for the option to result in an increase in carbon emissions as a result of transporting water efficiency devices to customer's homes.

No major or moderate positive effects have been identified in relation to D-02. Minor positive effects were identified for objectives 2.2 '*Provide a sustainable water supply in times of drought'* and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity.'* Positive effects relate to the option contributing towards a sustainable water supply by helping customers to use less water. Furthermore, water efficiency devices should reduce water demand which may result in more water being retained in the natural environment and reduce customer bills.

Neutral effects were identified for all the remaining objectives due to demand options having minimal effect on the natural environment. Although generally, demand options may offer improvements through retaining more water in the natural environment which may benefit habitats, species and water quality effects are not considered to be significant, therefore overall, neutral effects were identified for most objectives.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
D-02	0	0	0	0	+	0	0	-	0	0	+	0	0

2.2.2 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Use low-carbon transport options (e.g. electric fleet or consolidated postal deliveries) to minimise emissions associated with device distribution.
- Provide clear installation guidance to customers to avoid incorrect fitting, preventing unnecessary waste or repeat deliveries.
- Prioritise devices with recycled or low-impact materials and encourage return or recycling of old fixtures where applicable.
- Coordinate device distribution with communication campaigns (D-01) to raise awareness of proper use and maximise behavioural uptake.
- Monitor distribution volumes and device uptake geographically to ensure promotion is appropriately targeted and equitable across customer groups.
- Where possible, integrate with smart-metering data to assess water-saving performance and refine future distribution strategies.

2.2.3 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- The degree of water savings is dependent on customer uptake and correct installation; further research is needed to understand behavioural follow-through.
- Limited baseline consumption data in low-metered areas makes it difficult to quantify the impact of devices; targeted metering studies would support verification.
- Interaction with other demand-side measures (incentives, communications, leakage reduction) may complicate attribution of savings to devices alone.

- The lifespan, durability and long-term performance of distributed devices require further monitoring to understand replacement needs and waste implications.
- More evidence is needed on which device types provide the greatest efficiency gains relative to cost and carbon impacts.
- Seasonal variability in usage patterns may influence device effectiveness; additional assessment is required to determine performance during peak drought periods.

2.3 D-03 – Reward through billing

2.3.1 SEA Summary Findings

No negative effects were identified in relation to D-03.

No major or moderate positive effects have been identified in relation to D-03. Minor positive effects were identified for objectives 2.2 '*Provide a sustainable water supply in times of drought'* and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity.'* Positive effects relate to the option contributing towards a sustainable water supply by helping customers to use less water. Furthermore, water efficiency devices should reduce water demand which may result in more water being retained in the natural environment and reduce customer bills.

Neutral effects were identified for all the remaining objectives due to demand options having minimal effect on the natural environment. Although generally, demand options may offer improvements through retaining more water in the natural environment which may benefit habitats, species, water quality and reduced operational carbon emissions, effects are not considered to be significant, therefore overall, neutral effects were identified for most objectives.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
D-03	0	0	0	0	+	0	0	0	0	0	+	0	0

2.3.2 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Design incentive structures that avoid unintended demand spikes (e.g. end-of-period "catch-up" use) and reward sustained savings over time, with thresholds aligned to drought triggers and levels.
- Coordinate incentive messaging with ongoing customer communications (D-01) and water-saving device programmes (D-02) to maximise uptake while maintaining a factual, non-advisory tone.
- Implement equitable participation safeguards (e.g. Priority Services Register alignment and proportionate rewards for different customer types) so savings are achievable without disproportionate impacts on vulnerable users.
- Monitor consumption at appropriate intervals (e.g. billing periods or smart-meter reads where available) to verify savings and adjust incentives where uptake or performance is lower than anticipated.
- Provide clear, accessible information on data use and privacy associated with any enhanced metering or billing analytics used to administer incentives.

2.3.3 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- The scale and duration of savings depend on customer engagement and may diminish once incentives end.
- Concurrent rollout of TUBs/NEUBs, customer communications and leakage activity may make it difficult to isolate which activity is responsible for any observed changes. Develop an evaluation plan to isolate the effect of billing incentives.
- Assess how incentives perform across different customer groups (including Priority Services Register households) and test alternative reward designs to avoid unintended distributional effects.
- Confirm that savings observed in pilot areas are representative across SBB supply zones and operational contexts.

2.4 D-04 – Customer-Side Leakage

2.4.1 SEA Summary Findings

No major or moderate negative effects were identified in relation to D-04. A minor negative effect was identified for objective 4.1 '*Reduce embodied and operational carbon emissions'* and 7 '*Minimal resource use and waste production'*. These are largely attributed to the possible increase in carbon emissions related to an increase in vehicle use as well as carbon emissions from works required to fix leaks, in addition to the potential for an increase in waste to be produced and additional materials needed to fix leaks.

No major or moderate positive effects have been identified in relation to D-04. Minor positive effects were identified for objectives 2.1 '*Protect and enhance the quality of the water environment and water resources,'* 2.2 *'Provide a sustainable water supply in times of drought'* and 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity.'* These effects are related to possible improvements to water quality when water is retained within the natural environment by reducing customer-side leakage and the option contributing towards a sustainable water supply by helping to reduce water losses. Additionally, reducing customer-side leakage will likely lead to reduced losses resulting in a reduction in water consumption and saving customers money.

Neutral effects were identified for all the remaining objectives due to demand options having minimal effect on the natural environment. Although generally, demand options may offer improvements through retaining more water in the natural environment which may benefit habitats, species and water quality effects are not considered to be significant, therefore overall, neutral effects were identified for most objectives.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
D-04	0	0	0	+	+	0	0	-	0	0	+	0	-

2.4.2 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Provide clear customer guidance and support for identifying and reporting leaks, ensuring rapid repair without causing unintended increases in short-term water use.
- Coordinate customer-side leakage campaigns with broader communication measures (D-01) and water-saving initiatives (D-02 and D-03) to maximise cumulative demand reduction.
- Implement data-driven targeting using meter reads or night-use analysis to identify potential leakage hotspots while maintaining data-protection safeguards.
- Offer tailored support mechanisms for vulnerable customers or those on the Priority Services Register to enable equitable access to leak repair assistance.
- Ensure contractors or approved repair partners follow best-practice standards to minimise excavation waste and local disturbance.
- Monitor repair outcomes and verify reductions in consumption to refine programme design and identify seasonal or location-specific trends.

2.4.3 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- The scale of water savings depends on customer uptake, response times and repair behaviour, requiring further research into incentives and barriers to participation.

- Limited metering coverage in some areas constrains the ability to detect and quantify customer-side leakage; additional metering studies would improve accuracy.
- Seasonal variations in consumption may obscure leakage patterns; further data collection is needed to distinguish base use from losses.
- Interaction with other demand-side measures (e.g. other network demand impacting options) may make it difficult to isolate the specific contribution of customer-side leakage reductions.
- Evidence is needed on the long-term effectiveness of repair interventions, including recurrence rates and the durability of customer-side plumbing repairs.
- Further assessment is required to identify cost-effective targeting methods, particularly where mixed property types or complex pipe configurations reduce detection accuracy.

2.5 D-05 – Active Leakage Control

2.5.1 SEA Summary Findings

No major or moderate negative effects were identified in relation to D-05. Minor negative effects were identified for objectives 1.2 '*Protect and enhance ecology and biodiversity, including habitats and species of principal importance and water-sensitive sites'*, 3 '*Protect and enhance the functionality, quantity and quality of soils, including the protection of sites of geological importance*', 4.1 '*Reduce embodied and operational carbon emissions',* 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity'* and 7 '*Minimal resource use and waste production'*. These are largely attributed to the possible impacts associated with intrusive works to fix leaks, which may result in temporary disturbance to principal habitats and species, potential for localised soils disturbance, increased carbon emissions, possible noise and air quality effects and a potential increase in waste and resource use.

No major positive effects were identified in relation to D-05. A moderate positive effect has been identified for objective 2.2 '*Provide a sustainable water supply in times of drought.'* This is because the option is likely to significantly contribute to a sustainable water supply by decreasing water losses from leakage. This will lead to more water being retained in the environment during a period of drought.

A minor positive effect was identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources.'* This is because the Active Leakage Control options focus on increasing and accelerating the identification and resolving of leaks within SBB infrastructure to ensure more leaks are fixed than in a usual scenario. This will ensure more water is retained in the natural environment during a drought period, potentially improving water quality and quantity and protecting water resources.

Neutral effects were identified for all the remaining objectives due to demand options having minimal effect on the natural environment. Although generally, demand options may offer improvements through retaining more water in the natural environment which may benefit receptors such as designated sites, effects are not considered to be significant, therefore overall, neutral effects were identified.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
D-05	0	-	0	+	++	0	-	-	0	0	-	0	-

2.5.2 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Pollution control measures should be in place whilst work is carried out.
- Best practice measures to be incorporated in Construction Environmental Management Plan (CEMP) if required, including ensuring minimal disturbance to habitats and species.
- Best practice mitigation should be implemented when works are taking place to reduce emissions as far as possible and to prevent impacts to noise and air quality as well as visual amenity.
- Consider whole life implications and potential for repeat failure when selecting the remediation pathway.

2.5.3 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- The scale of water savings depends on how effectively Active Leakage Control is implemented.

- Limited metering coverage in some areas constrains the ability to detect and quantify customer-side leakage; additional metering studies would improve accuracy.
- Seasonal variations in consumption may obscure leakage patterns; further data collection is needed to distinguish base use from losses.
- Interaction with other demand-side measures (e.g. other network demand impacting options) may make it difficult to isolate the specific contribution of Active Leakage Control reductions.
- Evidence is needed on the long-term effectiveness of repair interventions, including recurrence rates and the durability of customer-side plumbing repairs.
- Further assessment is required to identify cost-effective targeting methods, particularly where mixed property types or complex pipe configurations reduce detection accuracy.

2.6 D-06 – Pressure Management

2.6.1 SEA Summary Findings

No major or moderate negative effects were identified in relation to D-06. A minor negative effect was identified for objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture.'* This is due pressure management reducing water flow, which may have an adverse effect on business and agriculture if reduced pressure affects water availability for certain users or activities, particularly as this would likely occur during the summer, which is peak tourist season.

No major or moderate positive effects were identified in relation to D-06. A minor positive effect was identified for objective 2.2 '*Provide a sustainable water supply in times of drought.'* This is because the option is likely to contribute to a sustainable water supply by decreasing water losses from leakage. This will lead to more water being retained in the environment during a period of drought.

Neutral effects were identified for all the remaining objectives due to demand options having minimal effect on the natural environment. Although generally, demand options may offer improvements through retaining more water in the natural environment which may benefit habitats, species, water quality and reduced operational carbon emissions, effects are not considered to be significant, therefore overall, neutral effects were identified for most objectives.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
D-06	0	0	0	0	+	0	0	0	0	0	0	-	0

2.6.2 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- Best practice mitigation should be implemented when works are taking place to reduce emissions as far as possible.
- Targeted operational controls and timely communication with affected users should help reduce any adverse effects on businesses, tourism sites or agricultural activities where lower pressure affects water availability.

2.6.3 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- The scale of water savings is uncertain and is dependent on how effectively pressure management is implemented.
- Seasonal variations in consumption may obscure data; further data collection is therefore needed.
- Interaction with other demand-side measures (e.g. other network demand impacting options) may make it difficult to isolate the specific contribution of pressure management.

2.7 D-07 – Temporary Use Bans

2.7.1 SEA Summary Findings

No major negative effects were identified in relation to D-07. A moderate negative effect was identified for objective 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity.'* This is due to the implementation of TUBs potentially restricting the irrigation of gardens and allotments, use of water for recreational purposes, and use of water for cleaning of cars and domestic properties. Effects are likely to be greater with the implementation of option D-07b due to exemptions being removed. There is also likely to be reduced visual amenity due to restrictions on water used for garden watering, decorative fountains, and cleaning of buildings.

A minor negative effect has been identified for objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture.'* With TUBs in place, there is the potential for properties where tourists may reside to be affected by the restrictions, particularly as these measures would likely be implemented during peak tourist season.

No major positive effects have been identified in relation to D-07. A moderate positive effect has been identified for objective 2.2 '*Provide a sustainable water supply in times of drought.'* This is due to the option significantly contributing to water savings during a drought period, helping to retain more water in the natural environment. This is particularly the case for option D-07b due to the removal of exemptions such as domestic water use by Blue Badge holders or people registered to the Priority Services Register, watering newly laid turf, cleaning private leisure boats, or filling or maintaining a domestic swimming pool.

A minor positive effect was identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources.'* This is due to TUBs likely reducing water demand, which could lead to minor benefits upon the water environment and protection of water resources as more water would likely be retained in the natural environment during periods of drought.

Neutral effects were identified for the remaining objectives due to the implementation of TUBs having no discernible effect on biodiversity, flood risk, soils, historic environment and material assets. In relation to the two climate objectives, implementation of TUBs may slightly benefit resilience of the natural environment and may decrease emissions associated with treatment and distribution, however, this is not anticipated to be substantial and the level of success is not certain, therefore a neutral effect was identified.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
D-07	0	0	0	+	++	0	0	0	0	0	--	-	0

2.7.2 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- High levels of communication before, during and following the implementation of TUBs should be undertaken to minimise any negative effects on customer health and wellbeing as well as on customer income and business.

2.7.3 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- The scale of water savings depends on how effectively TUBs are implemented and followed.
- Limited metering coverage in some areas constrains the ability to detect and quantify the effectiveness of TUBs.

- Seasonal variations in consumption may obscure patterns; further data collection is needed.
- Interaction with other demand-side measures as well as different types of TUBs (e.g. tariff incentives, drought messaging) may make it difficult to isolate the specific contribution of TUBs.

2.8 D-08 – Non-Essential Use Bans

2.8.1 SEA Summary Findings

No major negative effects were identified in relation to D-08. A moderate negative effect has been identified in relation to objective 6.2 '*Sustaining water supplies for the local economy, including tourism, business and agriculture,'* as NEUBs target businesses which utilise water. Businesses that rely heavily on water use for income such as non-domestic window cleaning and exteriors, swimming pools, and vehicles are likely to be affected as a result of NEUBs. Additionally, employees of these types of businesses are generally self-employed/freelancers who are more vulnerable to loss of income and financial instability.

A minor negative effect was identified in relation to objective 6.1 '*Maintain and enhance the health and wellbeing of the local community, including recreation and visual amenity.'* This is due to temporary effects on the local community due to the implementation of NEUBs restricting commercial activities that use water, potentially affecting visual amenity or recreation (e.g. cleaning of property exterior and windows for business, effects on commercial garden and landscapes, watering of sports pitches, and use of member only swimming pools). Effects are likely to be greater with the implementation of option D-08b due to exemptions being removed.

No major positive effects have been identified in relation to D-08. A moderate positive effect has been identified for objective 2.2 '*Provide a sustainable water supply in times of drought.'* This is due to the option significantly contributing to water savings during a drought period, helping to retain more water in the natural environment. In particular, option D-08b is likely to result in more water savings due to the removal of exemptions such as allowing customers who are on the Priority Services Register or physical unable to use water can/buckets safely for watering outdoor plants on commercial premises, filling or maintaining a non-domestic swimming pool, and cleaning non-domestic properties.

A minor positive effect was identified for objective 2.1 '*Protect and enhance the quality of the water environment and water resources.'* This is due to NEUBs likely reducing water consumption, which could lead to minor benefits upon the water environment and protection of water resources as more water would likely be retained in the natural environment during periods of drought.

Neutral effects were identified for the remaining objectives due to the implementation of NEUBs having no discernible effect on biodiversity, flood risk, soils, historic environment and material assets. In relation to the two climate objectives, implementation of NEUBs may slightly benefit resilience of the natural environment and may decrease emissions associated with treatment and distribution, however, this is not anticipated to be substantial and the level of success is not certain, therefore a neutral effect was identified overall.

Option Ref	Biodiversity			Water			Soil	Climate		Historic Env	Population & Human Health		Material Assets
	1.1	1.2	1.3	2.1	2.2	2.3	3	4.1	4.2	5	6.1	6.2	7
D-08	0	0	0	+	++	0	0	0	0	0	-	--	0

2.8.2 Mitigation

The following mitigation measures have been identified, in addition to following best practice:

- High levels of communication before, during, and following the implementation of these NEUBs should be undertaken to minimise any negative effects on customer health and wellbeing as well as on customer income and business.

2.8.3 Uncertainties & Further Work

At the current stage of assessment, the following uncertainties and requirements for further work have been identified:

- The scale of water savings depends on how effectively NEUBs are implemented and followed.
- Limited metering coverage in some areas constrains the ability to detect and quantify the effectiveness of NEUBs.
- Seasonal variations in consumption may obscure patterns; further data collection is needed.
- Interaction with other demand-side measures as well as different types of NEUBs (e.g. tariff incentives, drought messaging) may make it difficult to isolate the specific contribution of NEUBs.