MOTT MACDONALD

SEA Environmental Report ANNEX 2: APPENDIX H

Habitats Regulations Assessment (HRA)

South West Water: Updated Draft Water Resources Management Plan 2024 (WRMP24)

December 2023

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	31/08/2023	J Willmott	L Griffiths-Law	M Reid	First Issue
B	29/09/2023	J Willmott	L Griffiths-Law	M Reid	Updated Report
C	06/02/2023	J Willmott	K Thorne	M Reid	Updates to BVP for Consultation
D	25/09/2023	C Kean	J Willmott	A L Wilson	Revised Draft WRMP for Consultation
E	08/12/2023	C Kean	J Willmott	M Reid	Updated Draft with new information

Document reference: 100107117 | 100107117-MMD-TN-HRA-009-E | E |

Information class: Standard

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Executive summary

As a water company, South West Water (SWW) has a statutory obligation to produce a Water Resources Management Plan (WRMP) every five years. The WRMP sets out how a sustainable and secure supply of clean drinking water will be provided to its customers over a minimum 25-year planning period whilst showing how its long-term vision for the environment will be achieved. The Habitats Regulations Assessment (HRA) report sits within a suite of environmental assessment documents that accompanies the updated draft Water Resources Management Plan 2024 (updated dWRMP24). This assessment process feeds into the plan-making process as part of SWW's Best Value Plan (BVP) approach.

This report presents the results of the HRA of the updated dWRMP24, pursuant to Regulation 63 of the Habitats Regulations. During development of the updated dWRMP24, a total of 75 supply options remain feasible for the WRMP, including 20 drought options and six Strategic Resource Options (SROs).

In respect of supply options, this report includes the descriptions of all feasible supply and drought options, which have undergone HRA Stage 1 Screenings and Stage 2 Appropriate Assessments (AA). Upon receipt of the SWW BVP, alternative plans and adaptive pathways, an overview of all options and their inclusion in respective plans and pathways has been provided. However, this report only provides the detailed assessments of those options, supply and drought, which are included within the BVP and/or one or more of the alternative plans and adaptive pathways. In total, 22 options, 16 supply options of which three are SROs and six drought options, have full assessments detailed within this report. Full assessments of the other feasible options can be provided upon request.

The primary objective of the HRA is to safeguard the protected features of a Special Area of Conservation (SAC) or Special Protection Area (SPA), as part of the national sites network (NSN). It is government policy to afford the same level of protection to a candidate Special Area of Conservation (cSAC), potential Special Protection Area (pSPA), a listed or proposed Ramsar site and sites identified, or required, as compensatory measures for adverse effects on the above listed site designations. These sites are collectively referred to as 'Habitats Sites' hereafter.

The Stage 1 Screening is the process which identifies the potential effects upon the Habitats Sites and considers if these are likely to be significant. The AA assesses the implications the supply options will have on the conservation objectives of Habitats Sites and ultimately as to whether there is an adverse effect on site integrity. Mott MacDonald Limited undertook these assessments following the methodology in the UK Water Industry Research Limited's '*Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15)*'.

The updated dWRMP24 presents significant opportunities to bolster the water available to the environment in order to support healthy rivers and watercourses and ensuring the protection and enhancement of our natural habitats. The BVP proposed by SWW includes nine supply options of which three are SROs and four drought options. In total, one of these options had no likely significant effects (LSE) and was screened out at Stage 1 of the HRA process. The remaining 12 options have been progressed to the Stage 2 AA, with the exception of the three SROs which were assessed externally. Summaries of the SRO HRAs are provided within this report. One of the SRO options, WIM18, has not been fully developed at the time of writing and so a full HRA assessment has not been completed.

Prior to mitigation, there is reasonable scientific doubt as to the absence of adverse effects of the integrity of Habitats Sites for the 12 options which are within the BVP and progressed to Stage 2 AA. The robust mitigation measures described in this assessment can avoid and mitigate adverse effects. However, at this stage, the WRMP24's compatibility with the statutory protection afforded to Habitats Sites cannot be confirmed as one of the supply options has not been assessed. Further assessment of SRO option WIM18 will be required during option development.

In this report the importance of establishing robust programmes of investigation is recognised, conducting further research, and implementing effective mitigation measures to proactively inform option design. These actions will reinforce the updated dWRMP24's positive effects on biodiversity and environmental well-being. The findings indicate that the successful implementation of the updated dWRMP24 and the achievement of its intended positive outcomes are dependent on adhering to the mitigation measures developed with consideration to the appropriate guidance.

For the supply options assessed within this report, assuming that all proposed mitigation measures are implemented, it is considered that at the plan level there will not be a significant change in:

- The extent and distribution of qualifying natural habitats and the habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats or the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within Habitats Sites.

Provided that the same approach and principles are applied to the future assessment of supply option WIM18, it is considered that SWW will be able to ascertain beyond reasonable scientific doubt that the proposed updated dWRMP24 plans (BVP, alternative plans and adaptive pathways) will not adversely affect the integrity of any Habitats Site, alone or in combination with other plans or projects.

Table of acronyms

Acronym	Meaning
AA	Appropriate Assessment
AMP	Asset Management Plan
BNG	Biodiversity Net Gain
BVP	Best Value Plan
CEMP	Construction and Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
COSA	Conservation Objectives Supplementary Advice
cSAC	Candidate Special Area of Conservation
CTMP	Construction Traffic Management Plan
DAF	Dissolved Air Flotation
DSR	Distribution Service Reservoir
dWRMP	Draft Water Resource Management Plan
EA	Environment Agency
EAR	Environmental Assessment Report
ECoW	Ecological Clerk of Works
FBC	Flat Bottomed Clarifier
GAC	Granular Activated Carbon
HDS	High-density Sludge
HLS	High Level Screening
HOF	Hands Off Flow
INNS	Invasive Non-Native Species
IPR	Indirect Potable Reuse
IR	Impounding Reservoir
IROPI	Imperative Reasons of Overriding Public Interest
IRZ	Impact Risk Zone
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effects
MCC	Motor Control Center
Ml/dMl/d	Mega litres per day
MW	Megawatt
NCA	Natural Capital Assessment via Ecosystem Services
NSIP	Nationally Significant Infrastructure Project
NSN	National Site Network
NTL	Normal Tidal Limit
Ofwat	Office for Water Services
PPG	Pollution Prevention Guidance
pSPA	Proposed Special Protection Area
RBD	River Basin District
RBMP	River Basin Management Plan

Acronym	Meaning
RGF	Rapid Gravity Filter
RWPS	Raw Water Pumping Station
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEPA	Scottish Environmental Protection Agency
SIP	Site Improvement Plan
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
SRO	Strategic Resource Option
SSSI	Site of Special Scientific Interest
STW	Sewage Treatment Works
UKWIR	UK Water Industry Research
UV	Ultraviolet
VSD	Variable Speed Drive
WAFU	Water Available for Use
WCWRG	West Country Water Resources Group
WFD	Water Framework Directive
WPS	Water Pumping Station
WRMP	Water Resources Management Plan
WRMP24	Water Resources Management Plan 2024
WRPG	Water Resources Planning Guidance
WR	Water Reuse
WRSE	Water Resources South East
WRZ	Water Resource Zone
WSR	Water Service Reservoir
WTW	Water Treatment Works
WwTW	Wastewater Treatment Works
ZoI	Zone of Influence

1 Introduction

1.1 Overview

The South West Water (SWW) supply area covers Devon, Cornwall, the Isles of Scilly and parts of Dorset, Somerset, Wiltshire and Hampshire, and provides drinking water to a population of 2.2 million people. Water resources in the SWW supply area consist of three large reservoirs, a number of smaller reservoirs, river intakes, and some groundwater sources which are predominantly in East Devon.

The SWW supply area is split into five Water Resource Zones (WRZs) in total. Three WRZs are operated in conjunction with one another to maximise water availability, these are Colliford, Roadford, and Wimbleball WRZs. Bournemouth WRZ and Isles of Scilly WRZ operate independently.

As a water company, SWW has a statutory obligation to produce a Water Resources Management Plan (WRMP) every five years. The WRMP sets out how a sustainable and secure supply of clean drinking water will be provided to its customers over a minimum 25-year planning period, whilst showing how its long-term vision for the environment will be achieved. Wider societal benefits, such as tourism, are also considered and balanced against the plan being affordable to create a 'Best Value' Plan (BVP).

In the development of a WRMP, companies in England and Wales must follow the Environment Agency (EA) / Office for Water Services (Ofwat) Water Resources Planning Guideline (WRPG)[1], consider broader government policy objectives and adhere to the relevant legislation. SWW's plan-making for the updated draft of the WRMP 2024 (updated dWRMP24) has undertaken all six environmental assessments that were highlighted in the WRPG. The broad scope of the Strategic Environmental Assessment (SEA) process has been used as a framework to integrate the findings of the other environmental assessments to avoid duplication and inconsistency across the specific requirements of each assessment:

- Habitats Regulations Assessment (HRA)
- Water Framework Directive (WFD) assessment
- Natural Capital Assessment via Ecosystem Services (NCA)
- Biodiversity Net Gain (BNG) assessment
- Invasive Non-Native Species (INNS) risk assessment.

The development of a WRMP is a complex process involving the analysis of different types of information and data, the application of modelling and decision-making, and interaction, as required, with the six environmental assessments above.

SWW issued the draft WRMP24 (dWRMP24) for public consultation in February 2023 with the Statement of Response (SoR) published on 15 August 2023 in line with the requirements of the Guidelines. The updated dWRMP24 was submitted in early October 2023 and has been subject to an eight-week public consultation period between October and December 2023.

A number of options were developed or refined during summer 2023 for inclusion in the updated dWRMP24. The SEA and HRA assessments for these options could not be fully completed for integration into the October 2023 consultation documents. This document is an update of the

[1] Environment Agency, Natural Resources Wales, Office for Water Services (2023). Water resources planning guideline. Available at: Water resources planning guideline - GOV.UK (www.gov.uk)

October 2023 consultation version of the report, with HRA assessments for all required updated dWRMP24 options.

Following consultation on the updated dWRMP24, SWW will update the SoR with inclusion of the changes made in response to feedback received.

The HRA report sits within the suite of environmental assessment documents that accompany this updated dWRMP24. The assessment process undertaken to generate it feeds into the plan-making process as part of SWW BVP, discussed below.

1.2 The purpose of the Habitats Regulations Assessment

This HRA has been undertaken for SWW's updated dWRMP24, to inform any likely impediments to the practicality or deliverability of the options being taken forward. A HRA refers to the several distinct stages of assessment which must be undertaken in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations") to determine if a plan or project may affect the protected features of a Habitats Site before deciding whether to undertake, permit or authorise it.

All plans and projects which are not directly connected with, or necessary for, the conservation management of a Habitats Site, require consideration of whether the plan or project, in this case the updated dWRMP24, is likely to have significant effects on that site. This consideration – typically referred to as the 'Habitats Regulations Assessment screening' – should take into account the potential effects both of the plan itself and in combination with other plans or projects. At this stage, mitigation is not to be taken into account.

Where the potential for Likely Significant Effects (LSE) cannot be excluded, a competent authority must make an Appropriate Assessment (AA) of the implications of the plan for that Habitats Site, in view the site's conservation objectives (Regulation 63).

The competent authority may agree to the plan only after having ruled out adverse effects on the integrity of the Habitats Site. Where an adverse effect on the Habitats Site's integrity cannot be ruled out, and where there are no alternative solutions, the plan can only proceed if there are imperative reasons of over-riding public interest (IROPI) and if the necessary compensatory measures can be secured (Regulation 64).

Further consultation between the relevant competent authority (SWW) and the Statutory Nature Conservation Body (SNCB) (Natural England), will be required at the project stage. As such, this report will form the basis of future assessment iterations of the assessment.

Natural England will be consulted to advise whether the options presented in this report will adversely affect the integrity of Habitats Sites. The integrity of a site is defined as the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was designated[2].

1.3 Assumptions and limitations

Information provided by third parties, including publicly available information and databases, is considered to be correct at the time of publication. Due to the dynamic nature of the environment, conditions may change in the period between the preparation of this report, and the undertaking of the proposed works.

[2] UK Government (2019). Guidance on the use of Habitats Regulations Assessment [online] available at: Appropriate assessment - GOV.UK (www.gov.uk) (last accessed Aug 2022).

Any uncertainties surrounding, and limitations of, the assessment process are acknowledged and highlighted. Recommendations for avoidance, mitigation and future monitoring to address the potential adverse effects on the integrity of the Habitats Sites identified by this report are also based on the information available at the time of the assessment. It is acknowledged that the requirement for mitigation may change as the design of the options progresses. This is expected to be through increasing the level of detail available during later stages of option development for subsequent stages if the relevant options are progressed.

Assessments have been carried out for all developed feasible supply and drought options being taken forward to the final WRMP, with information correct as of December 2023. All of the options with full assessments detailed within this report are shortlisted under the ‘Best Value’ planning process, or any alternative plans and adaptive pathways.

As of December 2023, one of the supply options which is shortlisted within the BVP and some of the alternative plans and adaptive pathways (SRO option WIM18) has not been subject to environmental assessment due to limited data and is not summarised in full within this report. As an SRO, this option is going through a separate RAPID Gated process of environmental assessment. The available high-level information on this option has been incorporated as far as possible.

In respect of supply options, this report includes HRA Stage 1 Screenings and Stage 2 Appropriate Assessments (AA), where applicable, of 16 supply options (including three SRO summaries) and six drought options within the body of the text. Table 3.3 details all feasible options which have been developed and identifies those which are part of the alternative plans and adaptive pathways. A summary of the options which have been progressed to Stage 2 of the HRA process, the AA, is also provided within the table.

2 Options descriptions

2.1 Updated dWRMP24 supply and drought options

The following supply options have been identified by SWW as under consideration for the final WRMP and remain feasible even if they are not included within the BVP, alternative plans and/or adaptive pathways. This document details all the supply and drought options which have been available for assessment as of December 2023.

Three of the supply options included in the BVP, alternative plans and/or adaptive pathways are not assessed within this document because they are SROs and have been assessed independently. A further seven drought options have no information because they have been assessed externally as they require an Environmental Assessment Report (EAR); none of these drought options are included within any of the plans or adaptive pathways. Summaries of the findings of the respective SRO HRA assessments have however been included within this report. This includes:

- BNW7 Mendips Quarry – Raw water transfer and augmentation of the River Stour SRO
- BNW8 Poole Harbour FE-reuse SRO
- WIM18 Cheddar 2 to Bickham Moor - New Strategic Regional Reservoir, Treatment and Transfer SRO

The limitations surrounding a full assessment of SRO option WIM18 are provided within Section 1.3 above and Section 19.

The findings of the Stage 1 Screening assessments are summarised within Table 3.3, which includes those options which have been progressed to Stage 2 of the HRA process (AA) and also the supply options which are part of the current BVP, alternative plans and/or adaptive pathways.

2.1.1 BNW1 Borehole development, existing borehole remedial works

This option will provide additional water from a new borehole and pump, which will be distributed to the nearby water treatment works. The scoped works required at the WTW include additional headworks, kiosk, and pipework will be required to connect it into the works as well as upgrades to the chemical storage and dosing equipment at the works, a new chlorine contact tank, dirty washwater system, run to waste as well as instrumentation and controls will be required, and a new pressure filter. This option assumes that there will be no additional WTW capacity required and that the existing power source will be sufficient.

2.1.2 BNW6 Longham Aquifer Recharge

This scheme assumes the development of an aquifer storage and recovery operation that will deliver a deployable output of approximately 10 Megalitres per day (Ml/d). Abstraction will occur for three months at a rate of 10 Ml/d, followed by a recharge phase injecting approximately 1,500 Ml/d, infiltration of a pre-treated blend of water from the Stour and Avon rivers would take place up to nine months per year. This would be at a rate of up to 5,000m^3 per day (208 m^3 per hour) - totalling 1,458,000m^3 over the nine months. Achievable infiltration rate per well would be 75m^3 per hour.

During the abstraction phase, stored water would be recovered during three months per year at a rate of 10,000m^3 per day (417m^3 per hour) - totalling 900,000m^3 over the three months. The achievable abstraction rate per well would be 150m^3 per hour.

The abstraction rate is likely to require at least three wells to achieve 10 Ml/d, particularly if the wells are near one another. Borehole location will need careful consideration at an early stage in the investigation.

2.1.3 BNW7 Mendips Quarry –Raw water transfer and augmentation of the Ml/dRiver Stour SRO

This option is to abstract raw water from Mendip Quarries and then transfer it to augment flows in the River Stour, to subsequently be abstracted by existing infrastructure to serve Wessex and Bournemouth Water. It will be necessary to purchase or obtain a leasehold of the quarry (leasehold would require a long-term agreement for access to water) and a new intake on the River Avon would be constructed to support refilling the reservoir.

A new transfer pipe from the river to the quarry will be required and a new shaft from where the flow will enter the quarry. The raw water would be treated for invasive non-native species and water quality before being transferred to the River Stour. Transfer of water to the River Stour (near Hinton St. Mary) from the quarry would be via a new pipeline (31.5km). A raw water abstraction of 50 Ml/d has been considered at the current stage.

This is an SRO option and was assessed separately. A full HRA is not provided within this report, although a summary of the assessment and conclusions is available within Section 8.

2.1.4 BNW8 Poole Harbour FE-reuse SRO

This option is to recycle treated final effluent from Poole wastewater treatment works (WwTW), via a new final effluent recycling centre, to augment flows in the River Stour for abstraction at Longham Lakes. Effluent would be diverted from Holes Bay (Coastal Water) to the Corfe Mullen area of the River Stour.

This is an SRO option and was assessed separately. A full HRA is not provided within this report, although a summary of the assessment and conclusions is available within Section 9.

2.1.5 BNW14 Ibsley Lake

This option is centred on abstracting water from Ibsley lake via the existing Matcham intake and deliver additional raw water supply to Knapp Mill water treatment works (WTW). This be achieved through the development of five boreholes, a new pumping station at Ibsley (with associated holding tank, headworks, and pipeline) and a new raw water pipeline (9.8km).

2.1.6 BNW16 Christchurch and Holdenhurst WwTW IPR3 – Further treatment and transfer to Knapp Mill WTW

This option is centred on the re-use of final effluent from Christchurch and Holdenhurst WwTW to augment treated water supply at Fawley. This would involve new pipelines and pumping stations to Knapp Mill WTW from Christchurch (1.3km) and Holdenhurst (4.2km), connecting a new water treatment works to Knapp Mill inlet works via a new 2.4km pipeline, a new water treatment works consisting of, chemical dosing, ozone dosing plant, chlorine dosing, clarifier, membrane filtration, washwater recovery and sludge plant, and a treated water pumping station and pipeline (0.7km) teeing into the existing Fawley water pipeline.

2.1.7 BNW17 Cheddar 2 new strategic regional reservoir and transfer

This iteration of the Cheddar 2 SRO is a treated water transfer to from Bristol Water to Bournemouth water. The key transfer stages are listed below:

- Raw water (spring water) pumping station and pipeline to Cheddar 2 reservoir;
- Raw water pipeline for River Axe preliminary treatment works to the reservoir;
- Cheddar 2 reservoir construction;

- Cheddar to Honeyhurst WTW pipeline;
- Construction of Honeyhurst WTW; and
- Treated water pipeline and pumping station from Honeyhurst WTW to Summerslade Service Reservoir.

The water from Cheddar 2 can then be used to offset the 20 Ml/d south (Sturminster/Corfe Mullen) to north (Summerslade Water Service Reservoir (WSR)) that occurs during the spring/summer months.

2.1.8 BNW18 Alderney WTW – Reduce Treatment Losses

This option is centred on removing the existing treatment losses at Alderney water treatment work by providing equipment to intercept, collect and return slow sand filter ripening water and providing equipment to intercept, collect, thicken and transfer solids from the pressure filters to the slow sand filters.

2.1.9 BNW19 Knapp Mill WTW – Reduce Treatment Losses

This option is centred on removing the existing treatment losses at Knapp Mill water treatment work by providing a treatment process for rapid gravity filter (RGF) dirty washwater flow, provide equipment to intercept, collect and return slow sand filter ripening water, and provide treatment process for dirty sand washwater flow.

2.1.10 COL2 Colliford PS Stage 2 – River Camel Abstraction

This option is to take water (up to 90 Ml/d in periods of high flows) from the lower River Camel via a new raw-water intake structure comprised of a weir, fish passing point, eel screen, raw water pumping stations, and a new pump pipeline discharging into a gravity pipeline connected to Restormel WTW. The new location for abstracting raw water will protect the impounded water at Colliford Reservoir during a period of drought and protect the St Neot stream from the negative effects of water release from the reservoir. This scheme shares a significant interface with the planned reversal of flow in the Restormel WTW to Colliford Impounding Reservoir (IR) raw-water pipeline scheme. As part of the combined scheme, two 1-megawatt turbines are proposed to recover energy from the pipeline at Restormel WTW.

2.1.11 COL3 Abstraction of Colliford compensation flows when making supply releases

The current operating practice is that a flow of water from the reservoir feeds into the downstream river continuously to negate the environmental impact of abstractions. This compensation release is a ‘passive’ activity which happens regardless of whether water is being abstracted downstream. At present, if water is required for abstraction downstream of the reservoir, water is actively released in addition to that from the compensation flow.

This option will require a change to the existing abstraction licence at the River Fowey, specifically reducing the compensation flow when large water supply releases are made from Colliford reservoir for downstream abstraction. The active supply release delivers the benefits of the compensation flow between the reservoir and the abstraction point. This will need to be agreed upon with the Environment Agency (EA) in conjunction with environmental investigations and hydrological modelling.

2.1.12 COL4 Abstraction of Siblyback compensation flows when making supply releases

The current operating practice is that a flow of water from the reservoir feeds into the downstream river continuously to negate the environmental impact of abstractions. This compensation release is a ‘passive’ activity which happens regardless of whether water is being

abstracted downstream. At present, if water is required for abstraction downstream of the reservoir, water is actively released in addition to that from the compensation flow. This option will require a change to the existing abstraction licence at the River Fowey, specifically reducing the compensation flow when large water supply releases are made from Siblyback reservoir for downstream abstraction. The active supply release delivers the benefits of the compensation flow between the reservoir and the abstraction point. This will need to be agreed upon with the EA in conjunction with environmental investigations and hydrological modelling.

2.1.13 COL5 Increase Wendron annual licence and de-couple from Stithians

This option proposes to decouple the abstraction licences at River Cober and Stithians reservoir to fully utilise the available water in the River Cober. The required amount of water would remain the same (12.5 Ml/d), meaning that more water would be taken from the River Cober annually, making more water available for abstraction from Stithians reservoir. This change will need to be agreed upon with the EA in conjunction with environmental investigations and hydrological modelling.

2.1.14 COL6 River Hayle Abstraction

This option is to take up to 2Ml/d of water from the River Hayle at St. Erth via an existing raw water intake structure and transfer it by a new pumping station to a new 2Ml/d package plant WTW.

It includes reusing the existing raw water main by locating the WTW adjacent to the site of the historic water treatment works or at a new site within the St.Erth WwTW where the existing raw water main would need to be extended by 325m.

This option would also reuse the existing water intake structure, located just above the normal tidal limit (NTL). The intake structure would have to be made compliant with the Eels (England and Wales) Regulations 2009. Treated water would then be injected into the Cornwall Spine Main.

2.1.15 COL9 Leswidden Pool

This option will abstract 5.46 Ml/d from the pontoon arrangement on Leswidden pool to a Braithewaite-type tank located on the shore of Leswidden pool via new raw water pumps and flexi-rising main. The raw water will then be pump from the Braithwaite-type tank to Sancreed Stream that drains into Drift reservoir for treatment, via a new 1.5km pipeline.

2.1.16 COL15 Restormel WTW

Restormel WTW has been identified as capable of increased production, from 93 Ml/d to its licensed maximum of 110 Ml/d. This will require additional treatment process upgrades across the site including, River intake - Low lift pump station, Clarification, RGFs, Interstage Pumping, granular activated carbon (GAC) contactors, Chlorine Contact Tank, Chemical dosing, Sludge Thickeners, Sludge Presses, Final Water Pumping, Pipelines. The additional raw water required can be supplied by a combination of the following WRMP options, COL22, COL23, COL24, COL25, COL26, or COL28.

2.1.17 COL16 College WTW Improvements – treatment and distribution system

This option is to upgrade the treatment capacity at College WTW in accordance with the existing abstraction licence. This will include provision of one additional rapid gravity filter and refurbishment of the two existing secondary filters along with other minor upgrades to other treatment processes.

2.1.18 COL19 Boswyn Stream/Cargenwen Reservoir/Carwynnen Stream

This option involves the following, a new pumped abstraction at the Carwynnen Stream transferring raw water to Boswyn Reservoir via a new 2.4km pipeline, a pumped abstraction at Cargenwen Reservoir transferring water to Boswyn Reservoir via a new 1.7km pipeline, a new 5.1 Ml/d capacity water treatment works at Boswyn Reservoir, and a treated water pumping station and a new 3.9km pipeline to Trevu service reservoir. In 2022 we gave up our existing abstraction licence for this location. Further environmental work is required to confirm the sustainable operating parameters for this scheme and a new licence will need to be granted.

2.1.19 COL20 River Fal new abstraction

To abstract raw water (25 MLD) from the River Fal at Grampound and transfer via a new raw water screened intake structure and pumping station to a new 25 Ml/d water treatment works (WTW) at Grampound Road. The raw water abstraction would have to be made compliant with The Eels (England and Wales) Regulations 2009 with the addition of 1mm to 2mm size eel screens and of a suitable area to control intake velocity to 0.1-0.2m/s.

Treated flows are to be distributed both locally by transfer into two Local distribution service reservoirs (DSR) north and south of the proposed WTW site and by Injection into the treated water Cornwall Spine Main via a new 500mm diameter trunk main.

2.1.20 COL21 South Crofty & Wheel Jane – Mine Water Reclamation

This option comprises of two mine water reclamation schemes at Wheal Jane and South Crofty mines. Both schemes will further treat the mine water beyond the current high-density sludge (HDS) plant water quality, in order the discharge into Stithians reservoir via new pumping stations and new pipelines. It is assumed that the reverse osmosis (RO) concentrate for both Wheal Jane and South Crofty will be conveyed to Camborne WwTW.

Wheal Jane treatment processes – Pre-treatment chemical dosing, MnO_2 sand filter, Ferric chloride and sulphuric acid dosing, 0.15µm strainer, Ultrafiltration membrane, Reverse osmosis membrane, Re-hardening and pH adjustment with calcium hydroxide.

South Crofty scheme – Pre-treatment chemical dosing, 0.15µm strainer, Ultrafiltration membrane, Reverse osmosis membrane, Re-hardening and pH adjustment with calcium hydroxide.

2.1.21 COL22 Roadford to Colliford via Saltash

This option is centred on providing additional resilience in Colliford WRZ through supplying treated water from Roadford WRZ. This could be achieved by pushing more potable water through the existing main that links Winston Beacon service reservoir and Kit Hill service reservoir via an upgraded 200kilowatt (kw) booster station.

2.1.22 COL23 Mayflower WTW to Kit Hill (St. Cleer)

This option is centred on connecting Colliford and Roadford WRZs via a new bi-directional 400mm diameter 16.9km long interconnector. This interconnector would distribute treated water between Mayflower WTW in Roadford and Kit Hill service reservoir (via St Cleer WTW) in Colliford through four new treated water pumping stations.

2.1.23 COL24 Northcombe WTW to Launceston

This option is centred on providing water resilience in Colliford WRZ through the transfer of the surplus treated water at Northcombe WTW in a drought situation. This will require a new 300mm diameter, 21km long pipeline connected into the existing treated water pumping station at Northcombe WTW.

2.1.24 COL25 Brent Tor to Launceston

This option is centred on increasing resilience in the Colliford water resource zone via a new 400mm diameter 15.5km long interconnector. This interconnector looks to overcome the constraint around the availability of water in East Cornwall by importing it from the Roadford WRZ, significantly reducing the number of single source properties in Bastreet. The import of water from Roadford WRZ also helps to reduce pressure on Colliford's WTWs, freeing up treatment capacity to better utilise the additional resource made available by the drought and resilience schemes.

2.1.25 COL26 Restormel WTW to East Cornwall

This option would enable to transfer water between St Cleers WTW and Fox Park services reservoir in Restormel and vice versa via a new bi-directional 19km interconnector and three new potable water pumping stations.

2.1.26 COL28 Desalination Plant at Par

This option is centred on the purchase and installation of an additional desalination modular unit at an existing desalination plant in Colliford. All existing seawater abstraction infrastructure and raw water displacement infrastructure is sized to accommodate this additional treatment capacity. The treated seawater will require additional treatment at Restormel WTW.

2.1.27 COL29 Restormel – Increase Treatment Capacity to 120 Ml/dMl/d

Restormel WTW has been identified as capable of increased production, from 93 Ml/d to its licensed maximum of 120 Ml/d. This will require additional treatment process upgrades across the site including, River intake – Low lift pump station, Clarification, RGFs, Interstage Pumping, GAC contactors, Chlorine Contact Tank, Chemical dosing, Sludge Thickeners, Sludge Presses, Final Water Pumping, Pipelines. The additional raw water required can be supplied by a combination of the following WRMP options, COL22, COL23, COL24, COL25, COL26, or COL28.

2.1.28 ROA2 River Erme

This option looks to increase the amount of water available by moving the existing intake on the River Erme to a location where there is a higher flow rate, through the following:

- Construction of a new intake approximately 7.6-8.1km downstream of the existing intake on the River Erme;
- A new raw-water pumping station on a vacant plot of land within the sewage treatment works that is approximately 80m from the new abstraction point;
- A new reception shaft approximately 3-4m deep;
- A new raw water connection to the South Devon Spine Main – approximately 910m in length;
- Transfer raw water to Littlehempston WTW; and
- A new abstraction licence will be required, in conjunction with the Environment Agency and WINEP investigations.

2.1.29 ROA3 River Yealm

This option looks to increase the amount of water available by moving the existing intake on the River Yealm to a location where there is a higher flow rate, through the following:

- Construction of a new intake approximately 6.3km downstream of the existing intake on the River Yealm;

- A new raw-water pumping station on a vacant plot of land within the sewage treatment works that is approximately 25m from the new abstraction point;
- A new reception shaft approximately 3-4m deep;
- A new raw water connection to the South Devon Spine Main – approximately 230m in length; and
- A new licence will be required, in conjunction with the Environment Agency.

2.1.30 ROA4 Abstraction of Roadford compensation flow at Gunnislake when making supply releases

The current operating practice is that a flow of water from the reservoir feeds into the downstream river continuously in order to minimise the environmental impact on the river. This compensation release is a 'passive' activity which happens regardless of whether water is being abstracted downstream. At present, if water is required for abstraction downstream of the reservoir, we actively release water in addition to that from the compensation flow.

This option will require a change to the existing abstraction licence at the River Tamar, specifically reducing the compensation flow when large water supply releases are made from Roadford reservoir for downstream abstraction. The active supply release delivers the benefits of the compensation flow between the reservoir and the abstraction point. This will need to be agreed with the EA in conjunction with environmental investigations and hydrological modelling.

2.1.31 ROA6 Upper Tamar Lake increasing annual licence

This option is centred on increasing the frequency of abstractions from the Upper Tamar Lake, from nine months to 12 months of the year. The abstraction licence change will have to be agreed with the EA in conjunction with environmental investigations, long term monitoring and hydrological modelling. There is an existing investigation and options appraisal as part of WINEP24 (Upper Tamar Lake WINEP24 (AMP8)).

2.1.32 ROA7 Expansion of Northcombe WTW to 60 Ml/dMl/d

This option is centred on constructing new and repurposing existing treatment works processes, specifically, new parallel inlet works, new flocculation tanks, conversion of manganese filters to flocculation filters, GAC contactors upgrades, Manganese contactor upgrades, conversion of water tank into chlorination tank, Thickener upgrades, and all necessary ancillaries/pipework. This will enable Northcombe WTW to treat raw water up to the licence maximum of 60 Ml/d.

2.1.33 ROA12 Slade and Horedown WTW (GAC)

This option is centred on supplying additional raw water from Slade reservoir to Horedown WTW via a new raw water pumping station and an existing 3.5km pipeline as well as improving the water treatment quality at Horedown WTW via a new ozone/ GAC plant, increased chemical dosing, process wastewater treatment.

2.1.34 ROA13 Duckaller and Vennbridge

This option is based on proposed changes to two abstraction licences at Duckaller and Vennbridge boreholes (subject to successful application) and the installation of a new nitrate reduction facility at Burrows WTW. The existing raw water main between Duckaller and Burrows disinfection tank. Treatment wastewater will be connected to the adjacent sewer system at Burrows WTW.

2.1.35 ROA14 Raise Avon Dam

The preferred option is for the dam to be raised approximately 4m subject to structural engineering approval and flood risk assessments for heavily modified waterbodies. It is acknowledged that, due to the time limitation, no studies and/ or analysis has been undertaken involving a detailed review of the available project information and verification of the project parameters (including dam stability, etc).

A review of the original project design information suggests that the Avon dam was provisioned for raising to a limited height. Both the design and the dam are now over 60 years old. There will need to be significant studies and investigatory work to establish the condition of the dam and surrounding geology before any view on the height-raising methodology can be established and accurately costed.

A high-level schedule of quantities and method statement (as envisaged in the original design) has been produced at this stage in order to estimate a potential order-of-cost for raising the dam. This schedule and method statement is provisional pending further investigations which will include full environmental impact assessments, planning and public consultation. It is envisaged that the initial asset management plan (AMP) period will be concerned with addressing these areas as well as the engineering methodology.

2.1.36 ROA15 Gatherley phase 2

The completion of this scheme will require the construction of an additional raw water main to provide water supply resilience through a dual main between the River Lyd abstraction point and Roadford Reservoir, allowing the full 148 Ml/d to be transferred to Roadford Reservoir. This option is dependent on the successful application of an aggregate abstraction licence in AMP7 of Gunnislake, Lyd, and Gatherley.

2.1.37 ROA17 Littlehempston WTW

This option is centred on dualling the 9.22km trunk main from Littlehempston WTW to Gallows Gate DSR and dualling the 9.87km trunk main Littlehempston WTW leading to Blackdown DSR (Crabadon Cross Water Pumping Station (WPS)). This will minimise network working pressures and therefore increase the network capacity. Separate investigations are ongoing into the current capacity of the off-site high lift pumping and treated main.

2.1.38 ROA19 Cheddar 2 to Prewley – New Strategic Regional Reservoir, Treatment and Transfer

This iteration of the Cheddar 2 strategic resource option is a treated water transfer to from Bristol Water to Roadford WRZ. The option includes a new raw water pumping station and pipeline to Cheddar 2 reservoir, construction of Cheddar 2 reservoir, new WTWs, and new treated water pipelines and pumping stations.

Once the treated water is displaced to Wittall service reservoir it will offset supply from Maundown WTW that feeds the north Dorset network. The infrastructure requirements for this offsetting are a treated water pipeline and pumping station from Maundown WTW to Parsonage service reservoir, and a treated water pipeline and pumping station from Parsonage service reservoir to Prewley service reservoir.

2.1.39 ROA20 Mayflower WTW to Littlehempston WTW

This option is centred on construction of 38 km of new 800mm diameter potable water main and pumped system to enable to transfer up to 40 Ml/d. Currently there is no potable water link West-East and East-West between Roadford and Wimbleball. Licence capping and

environmental destination abstraction reductions from Littlehempston WTW's sources will drive the need to transport more water into the area. The Gatherley pumped storage scheme being delivered under the Green Recovery Programme will make available more raw water storage at Roadford Reservoir.

2.1.40 ROA21 Roborough to Littlehempston WTW

This is an alternative solution to Mayflower WTW to South Devon Treated, consisting of a 37 Km raw water transfer. There is already an existing raw water main that enables the transfer of raw water between Mayflower WTW and Littlehempston WTW. However, a duplication of the raw water main would add flexibility to the network.

2.1.41 WIM1 Abstraction of Wimbleball compensation flow at Northbridge when making supply releases

The current operating practice is that a flow of water from the reservoir feeds into the downstream river continuously in order to minimise the environmental impact on the river. This compensation release is a 'passive' activity which happens regardless of whether water is being abstracted downstream. At present, if water is required for abstraction downstream of the reservoir, we actively release water in addition to that from the compensation flow.

This option will require a change to the existing abstraction licence at the Northbridge River, specifically reducing the compensation flow when large water supply releases are made from Wimbleball reservoir for downstream abstraction. The active supply release delivers the benefits of the compensation flow between the reservoir and the abstraction point. This will need to be agreed upon with the EA in conjunction with environmental investigations and hydrological modelling.

2.1.42 WIM2 Sidford borehole commissioning

This option utilises a new borehole in Sidford (which totals four boreholes on a duty/duty/duty/standby arrangement), that feed raw water into the new water treatment works comprising of, catalytic pressure filters, chlorination, aeration tank, contact tank, and supply tank. The treated water will be distributed to an existing booster pumping station via a new treated water main, then onto Branscombe water tower. Further borehole pump testing will be required during detailed design.

2.1.43 WIM4 Wilmington springs annual abstraction increase

This option is centred on increasing the frequency of abstraction from Wilmington Springs, from nine months to 12 months of the year. The abstraction licence change will have to be agreed upon with the EA in conjunction with environmental investigations, long term monitoring and hydrological modelling.

2.1.44 WIM5 Indirect potable reuse – stream support for Dotton WTW

This option is centred on providing compensation flow (Stream Support) to the River Otter during low-flow periods via pumped treated final effluent from Sidmouth WwTW directly to the river using a new pumping station and pipeline (4.55 km) and an additional clarifier, nitrifying trickling filter, and chemical dosing to treat final effluent to the required quality for discharge. This, therefore, negates the need for compensation flows from Dotton borehole no.5, as per the environmental determination in the Dotton catchment.

2.1.45 WIM6 Increase Allers WTW capacity

This option is centred on increasing water production at Allers WTW, subject to an increase in the Bolham licence and a reduction in the Dotton licence (winter) to be agreed with EA. To

facilitate this production increase, the following treatment upgrades are required; a new river intake (eel screens, weir structure, upsize pumps), Clarification, RGFs, Interstage Pumping, GAC Contactors, Chemical Dosing - Sulphuric Acid, Lime, Polyaluminum Chloride, Clarifier Polymer, Chlorine, Sulphur Dioxide (SO_2), Phosphate (PO_4) and Sludge Polymer, Final Water Pumping, and Pipelines.

2.1.46 WIM7 Increase Pynes to licence limit 66.46 Ml/d

This option is to upgrade the existing water treatment works to make full use of the current licensed flow (66.46 Ml/d) abstracted at River Exe at Northbridge, through the following:

- Construction of new or enhanced intake structure including screening and pumping, new Inlet flash mixer, two flocculators, one additional clarifier, two additional rapid gravity filters;
- Two additional GAC contactors, Upgraded wastewater and sludge processing, Upgraded chemical dosing system, Additional/Upsized interprocess pumping/pipework and upgrades to feed pumps;
- Upgrade Power supply/ICA system/equipment and integrate with existing; and
- Consultation with the EA regarding changes to abstraction licence.

2.1.47 WIM8 Brampford Speke borehole

This option will be centred on the following, mechanical and electrical renewal of existing borehole (new pumps, motor control center (MCC), telemetry etc), transfer of raw water flow to river Exe by existing pipelines and new headwalls to riverbank at discharge locations. The current WINEP19 investigation will ensure that the new licence will be improved and more sustainable.

2.1.48 WIM9 Stoke Canon borehole

This option will be centred on the following, mechanical and electrical renewal of existing borehole (new pumps, MCC, telemetry etc), transfer of raw water flow to river Exe by existing pipelines and new headwalls to riverbank at discharge locations. The current WINEP19 investigation will ensure that the new licence will be improved and more sustainable.

2.1.49 WIM11 Couchill Springs, Seaton

This option involves the transfer of water from Couchill Springs to Bovey Lane WTW. A new pumping station at Couchill Springs is required along with new assets at Bovey Lane including a break tank, filters & UV disinfection. The solution would also utilise existing high lift pumps for treated water distribution.

2.1.50 WIM12 Allers Springs

The option proposes transfer of water from Allers Springs to Allers WTW. A new raw water pumping station consisting of concrete wet well and two submersible pumps is required at Allers springs in order to feed existing raw water tank and treatment at Allers WTW.

2.1.51 WIM13 Cheddar 2 to Parsonage – New Strategic Regional Reservoir, Treatment and Transfer - SRO

This iteration of the Cheddar 2 strategic resource option is a treated water transfer to from Bristol Water to Wimbleball WRZ. The option includes a new raw water pumping station and pipeline to Cheddar 2 reservoir, construction of Cheddar 2 reservoir, new WTWs, and new treated water pipelines and pumping stations. Once the treated water is displaced to Wittall service reservoir it will offset supply from Maundown WTW that feeds the north Dorset network.

The infrastructure requirements for this offsetting are a treated water pipeline and pumping station from Maundown WTW to Parsonage service reservoir.

This is an SRO option and was assessed separately.

2.1.52 WIM14 Whitecross Distribution Upgrade

A new main allowing 5 Ml/d of additional water from Pynes WTW supply zone to offset any deficit in the future production capabilities of Dotton WTW resulting from water quality of the boreholes or any potential licence changes. The increased resilience in the network would provide the flexibility to support Dotton, Ottery St.Mary Intermediate WTW and Allers WTW. The new main will be 5.7km long and 500 mm diameter and will run from Whitecross Service Reservoir to Sowton Industrial Estate.

2.1.53 WIM15 Northcombe WTW to Allers WTW

This option proposes a new 600mm diameter 74km long main linking Northcombe WTW to Allers WTW and a 1100kw pumping station enabling Roadford WRZ to support Wimbleball WRZ (20 Ml/d), especially for a 1 in 500 year drought resilience.

2.1.54 WIM16 FE reuse – Countess Wear and Mear Lane WwTW to River Exe

This option is centred on reusing the final effluent from two WwTW, Countess Wear and Mear Lane via new pumping stations and pipelines, providing additional treatment via a new final effluent (FE) recycling centre, and discharging the treated water to the river Exe via a new pumping station and pipeline. This will provide additional raw resources for abstraction and treatment at Pynes WTW.

2.1.55 WIM18 Cheddar 2 to Bickham Moor – New Strategic Regional Reservoir, Treatment and Transfer - SRO

This phase of the Cheddar 2 SRO is a treated water transfer from Bristol Water to Wimbleball WRZ. The option includes a new raw water pumping station and pipeline to Cheddar 2 reservoir, construction of Cheddar 2 reservoir, new WTWs, and new treated water pipelines and pumping stations. Once the treated water is displaced to Wittall service reservoir it will offset supply from Maundown WTW that feeds the north Dorset network. The infrastructure requirements for this offsetting are a treated water pipeline and pumping station from Maundown WTW to Bickham Moor service reservoir.

This is an SRO option and was assessed separately. A full HRA is not provided within this report, although a summary of the assessment and conclusions is available within Section 19.

2.1.56 dB1 Wimborne Borehole

This scheme entails abstracting from a disused, licensed groundwater source, under drought conditions, using new pumps and pipeline, distributing the abstracted water to Wimborne WTW, subject to a successful drought permit application.

2.1.57 dB2 Stanbridge Licence

The scheme entails increasing the daily licence limit, to enable abstraction above the current daily licence limit under drought conditions, in order to provide additional raw water to Wimborne WTW, subject to a successful drought permit application.

2.1.58 dC1 Restormel Licence

The scheme entails increasing the annual abstraction licence limit (to licence maximum) to enable greater winter pumped storage abstraction, to aid Colliford Reservoir refill. This will be

facilitated via the existing River Fowey intake and the existing infrastructure (pumping stations, pipelines, air valves etc) and a new drought permit.

2.1.59 dC2 Stannon Lake Licence

The scheme entails increasing the abstraction rate at Stannon Lake to 6 Ml/d by installing temporary pumps and pipework and successfully applying for a drought permit to abstract during the summer months.

2.1.60 dC3 Porth Reservoir and Rialton Intake

The scheme entails re-commencing abstraction from a licensed resource during the summer months. Releases are made from Porth Reservoir into Rialton Stream and abstracted at the existing Rialton Intake. Abstracted water will be treated at Coswarth WTW.

2.1.61 dCS1/E Colliford not releasing compensation flows when making supply releases

2.1.62 **The scheme entails not making compensation flow releases from Colliford reservoir into the river Fowey when making supply releases during the summer months, under a new drought permit.**dCS11/E Siblyback not releasing compensation flows when making supply releases

This scheme entails reducing the volume of compensation flows (by 50%) from the Siblyback Reservoir to the river Fowey when making supply releases, during the summer months, under a new drought permit.

2.1.63 dCS2/E Park Lake Licence

This scheme entails increasing the daily abstraction limit, under a new drought permit, at Park Lake from 8 Ml/d to 12 Ml/d, providing a water available for use (WAFU) benefit of 2 Ml/d.

2.1.64 dCS3/E Blackpool Pit

The option involves the abstraction from Blackpool Pit followed by transfer to Restormel WTW via a raw water pipeline. It involves abstraction from new source, using new abstraction infrastructure and pipeline to existing WTW.

2.1.65 dCS6/E Hawks Tor Pit

The option involves abstraction from Hawk's Tor Pit, with transfer to existing WTW. involves abstraction from new source, using new abstraction infrastructure and pipeline to Colliford reservoir.

2.1.66 dR2 Slade Reservoir

The scheme entails re-introducing a disused, licensed raw water source at Slade reservoir, installing pumps to abstract the water (during drought conditions) and transferring the abstracted water to Horedown WTW via an existing pipeline. This is subject to an approved drought permit from the EA because the source has been disused for a long period of time.

2.1.67 dR3 Challacombe Reservoir

The scheme entails re-introducing a disused, previously licensed raw water source, and transferring the abstracted water, under drought conditions, to Horedown WTW via an existing raw water pipeline. This is subject to an approved drought permit from the EA.

2.1.68 dR4 Meldon/Vellake to Roadford

The scheme entails abstracting from an existing river intake on the West Okement River at Vellake and laying a new pipeline to transfer the abstracted raw water from Vellake to Roadford Reservoir during drought conditions. This is subject to an approved drought permit from the EA.

2.1.69 dR5 Lee Moor unused quarries

The scheme entails abstracting from three quarries (Lee Moor pit, Whitehill Yeo pit & Cholwichtown pit), during drought conditions. The option involves the construction of a new pipeline adjacent to the Devon spine main from Lee Moor to Littlehempston WTW for treatment.

2.1.70 dRS1/E River Lyd (Summer)

Abstract from the River Lyd and transfer into Roadford Reservoir in summer. Using existing pipeline, subject to a prescribed flow agreed with the EA.

This option is an EAR and was assessed separately.

2.1.71 dRS15/E Roadford not releasing compensation flows when making supply releases

The scheme entails abstracting all the compensation flows released from Roadford reservoir into Gunnislake River when making supply releases, under drought conditions. This is subject to an approved drought permit from the EA.

2.1.72 dW1 Brampford Speke and Stoke Canon (North Exeter Boreholes)

This scheme entails abstracting from a disused, licensed groundwater source, under drought conditions, using new pumps and a new pipeline, releasing the abstracted water into the River Exe and abstracting this water at Pynes WTW, subject to a successful drought permit application.

2.1.73 dW2 Hook Springs Licence

The scheme entails removing the annual licence limit at Hook Springs intake, to enable abstraction at the daily licence limit throughout the year, under drought conditions, to provide additional raw water to Hook WTW, subject to a successful drought permit application.

2.1.74 dW3 Wilmington Springs Licence

The scheme entails removing the annual licence limit at Wilmington Springs intake, to enable abstraction at the daily licence limit throughout the year, under drought conditions, to provide additional raw water to Wilmington WTW subject to a successful drought permit application.

2.1.75 dW4 Wimbleball not releasing compensation flows when making supply releases

The scheme entails abstracting all the compensation flows released from Wimbleball reservoir, during drought conditions, into the River Exe when making supply releases, subject to a successful drought permit application.

3 Habitats Regulations Assessment process

3.1 Habitats Regulations Assessment process

The 2017 Regulations include measures to establish and maintain a network of sites protecting habitats which in themselves are valuable as well as for the species they support. These sites form a network that across Europe is known as Natura 2000, and domestically as the national site network (NSN), to maintain the favourable conservation status of habitats and species listed in the EU Habitats Directive [92/43/EEC] and the Birds Directive [2004/25/EC].

The national site network includes those areas designated under the Habitats Regulations as a Special Area of Conservation (SAC) or Special Protection Areas (SPA), collectively known as 'Habitats Sites.' It is government policy to afford the same level of protection to a candidate Special Area of Conservation (cSAC), potential Special Protection Area (pSPA), a listed or proposed Ramsar site and sites identified, or required, as compensatory measures for adverse effects on the above listed site designations. All these sites are collectively referred to in this document as 'Habitats Sites.'

For plans or projects that are not directly connected with, or necessary for, the conservation management of a Habitats Site there is a requirement under the 2017 Regulations to determine if such a plan or project may have adverse effects on the integrity of a Habitats Site. The process of undertaking this assessment is known as an HRA. The competent authority (SWW) may agree to the plan or project only after having ruled out adverse effects on the integrity of the Habitats Site(s).

The HRA process consists of three main stages, each stage being informed by the one preceding, to ensure an iterative and objective assessment. If the conclusion of the screening stage is that there will be no LSE, there is no requirement to undertake further stages. Similarly, if the AA stage concludes there will be no adverse effect on site integrity, then the assessment with respect to Regulation 63 of the 2017 Regulations is concluded. The HRA stages with respect to Regulation 63 are summarised within Table 3.1.

The third stage of the procedure is governed by Regulation 64 of the 2017 Regulations. If the AA stage concludes that there is likely to be an adverse effect on site integrity, it must be demonstrated that there are no alternative solutions to the plan or project, that the plan or project must be carried out for imperative reasons of overriding public interest, and that suitable compensatory measures can be secured to ensure that the overall coherence of the national site network is protected.

This report contains the assessment and result of screening (Stage 1) for all supply options which are being considered for the WRMP24, and AA (Stage 2), where applicable, i.e. LSE could not be ruled out beyond reasonable scientific doubt during the screening stage. No Stage 3 assessment needed to be undertaken because, following consideration of mitigation at the AA stage, there were considered to be no residual adverse effects on the integrity of Habitats Sites.

Table 3.1: HRA stages under Regulation 63 of the 2017 Regulations

Stage	Description
Screening (Stage 1)	This is the process which identifies the potential effects upon the Habitats Sites and considers if these are likely to be significant (see definitions below). Screening is an iterative process and before moving to Stage 2 it can be repeated if required. Proposals to mitigate any likely significant effects cannot be considered at the screening stage. If the Screening (Stage 1) identifies that the project or plan, alone or in combination, may have likely significant effects on a Habitats Site and/or its features of interest, or if there is uncertainty, the competent authority must undertake an Appropriate Assessment (Stage 2) of the implications for that Site in view of that Site's conservation objectives.
Appropriate Assessment (Stage 2)	This stage involves the consideration of the predicted adverse effects of the project or plan either alone, or in-combination with other projects or plans, on the integrity of the Habitats Site with respect to the Site's structure, function and conservation objectives. Additionally, where mitigation has been proposed to avoid or minimise likely significant effects, this stage includes assessment of the likely effectiveness of any mitigation applied. A key outcome of the Appropriate Assessment is to identify whether the integrity of the Habitats Site(s) is likely to be adversely affected by the plan/project.

Source: Based on European Commission, 2021. Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

This assessment has been undertaken in an iterative and objective manner following the above stages, with reference to best practice guidance and relevant case law (Appendix A) to inform the interpretation and therefore correct application of the terms 'likelihood, 'significance' and 'in-combination.'

Mott MacDonald Limited undertook this HRA in September 2023, following the methodology in the UK Water Industry Research (UKWIR) *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15)*[3].

3.2 Screening assessment methodology

Habitats Sites were identified using a distance-based threshold of 10km. This threshold is based on the premise that Natural England's Site of Special Scientific Interest (SSSI) Impact Risk (IRZ) extend out to a maximum of a 10km radius (excluding bespoke Impact Risk Zones) this was considered a robust threshold which was extended where appropriate when impact pathways were identified. Habitats Sites were assessed where they occur entirely or partly within the 10km threshold or where impact pathways link the option to more distant Habitats Sites, for example, those Habitats Sites that are hydrologically connected via surface or groundwater catchments.

In undertaking this HRA, a number of steps were undertaken to identify the relevant information to inform the assessment. Information gathered to inform the screening included the identification of:

- Any SPA/SAC/pSPA/cSAC/Ramsar sites, including any marine or marine elements of these sites within the potential ZoI, and any known areas of land outside the site boundary itself,

[3] UKWIR (2021). Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15), 287p.

which plays an important role in supporting the site and its features of interest (functionally linked land);

- Potential effects resulting from the option;
- The ZoI of these effects, noting this may extend some distance from the site and are not confined to activities on or adjacent to the site;
- Any viable pathways from the option to the receptor (Habitats Sites themselves or functionally linked land);
- The features of interest of the Habitats Site(s) in question; and
- The conservation objectives of the Habitats Site, including any site sensitivities given within any supplementary advice, site improvement plan, or equivalent document published by the relevant SNCB.

The above information was reviewed in respect of each feature of interest and potential development effect / impact pathway to inform an assessment of any LSE or adverse effects on integrity. Key aspects and terms used in this assessment are defined below:

- **Likelihood:** Where an effect was considered to be potentially significant, then the assessment of its occurrence was based on the likelihood of it occurring and not certainty that it would occur. Potential effects are scoped in unless there was evidence to the contrary demonstrating that they would not occur e.g. there being no valid pathway, or the absence of the species in that area, at that time.
- **Significance:** The significance of any effect is considered objectively, against the scale and nature of the impact in relation to those of that particular feature or condition and in relation to the extent of that feature or condition over the entire Habitats Site. A significant effect within this assessment is one which, if it occurred, would lead to a decline in the quality or status of the habitats or distribution, abundance, etc. of feature(s) of interest.
- **In-combination**: The assessment of in-combination effects considers those projects or plans which:
  - are currently in operation
  - are actually proposed - defined by being a valid live planning application, or any referenced with a local plan where there is potential for them being undertaken within a reasonable time period, specified within that plan.

In line with relevant case law (Appendix A), this assessment is undertaken in the absence of mitigation (including ‘best practice’ measures embedded into the option where these are intended for the avoidance of effects).

Where LSE were identified for a supply option, that option has been progressed to Stage 2 AA.

3.3 Appropriate Assessment approach and methodology

3.3.1 Approach

Where a plan or project is likely to, or has the potential to, give rise to LSE upon a Habitats Site, an assessment must be made of the implications of the plan or project, either alone or in combination with other plans or projects, on the integrity of the Habitats Site in view of the Habitat Site’s conservation objectives. This takes into account information on the habitats or species for which the site was selected, including but not limited to citations and Ramsar Information Sheets, conservation objective supplementary advice (COSA) and site improvement plans (SIP).

If adverse effects on the site’s integrity have been identified during the AA, or these cannot be ruled out, consideration is then given to introducing mitigation measures that will avoid or

reduce these effects to a level where they will no longer adversely affect the integrity of the Habitats Site.

At this plan-level stage, a worst-case scenario is assumed regarding significant effects on Habitats Sites and adverse effects on their integrity. In the absence of detailed information surrounding the options' designs, and a lack of targeted ecological survey data, conclusions made within this document have the potential to change with the provision of further information. As such, options which have been included within the AA here, could be scoped out at the screening stage of the project HRA, provided there is sufficient justification to do so. At present, options are taken to the Stage 2 AA where findings of no LSE cannot be concluded beyond reasonable scientific doubt.

Potential effects on the qualifying features of the Habitats Site(s) are evaluated with respect to the scale, extent and nature of the impact, for example the area of habitat affected, changes in hydrodynamics, potential changes in species distribution, and the duration of the impact. Given the high-level nature of the assessment at this plan stage it is not always possible to determine the exact scale and extent of the impact, when this is the case, a precautionary approach is taken when evaluating the significance of the impact.

To meaningfully inform the mitigation proposals for options within the plan, this assessment must be able to indicate how the effects can be avoided or mitigated through specific changes to the nature, scale, timing and location of development.

Where the plan recommends changes to the nature, scale, timing and location of development and the other measures, it is assumed that the design and implementation of the option at the project level will have regard to the conservation objectives of the Habitats Site in question which will be a requirement of any future consenting process. In particular, consideration will be given to the 'desired state' for the attributes (ecological characters) potentially affected, which if safeguarded, will enable achievement of the conservation objectives.

This assessment has been undertaken having had due regard to the following guidance, legislation and caselaw summarised in Appendix A:

- Appropriate Assessment. Guidance on the use of Habitats Regulations Assessment[4]
- Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans[5]
- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC[6]
- Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC [7].

For each option, a review was conducted of Natural England's SSSI Impact Risk Zones, including those relevant to 'Pipelines and underground cables, pylons and overhead cables' and all planning application ('All Consult'). In undertaking this review, functionally linked land was

[4] UK Government (2019). Guidance on the use of HRA [online] available at: https://www.gov.uk/guidance/appropriate-assessment (last accessed August 2023).

[5] UKWIR (2021). Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15), 287p.

[6] European Commission (2021). Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC [online] available at: https://ec.europa.eu/environment/nature/natura2000/management/pdf/methodological-guidance_2021-10/EN.pdf (last accessed August 2023).

[7] European Commission (2018). Managing Natura 2000 Sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/CEE [online] available at: https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/EN_art_6_guide_jun_2019.pdf (last accessed August 2023).

identified as best as possible in the absence of the full dataset (to attribute IRZs to specific Habitats Sites) and factored into the assessment. The risk of significant effects could be ruled out where it was clear there the option was not within a risk zone associated with a Habitats Site.

Functionally linked land refers to the role or 'function' that habitats beyond the boundary of a Habitats Site might fulfil in terms of ecologically supporting the populations for which the site was designated or classified[8]. Whilst it is not possible at the plan level assessment to undertake species presence/absence surveys over multiple years in order to define precisely what land within an option's ZoI is functionally linked to a Habitats Site, reliance can be placed on existing information. In this case functionally linked land or sea is considered to fall within the distance based SSSI Impact Risk Zone or the bespoke zones defined by Natural England, e.g., 'Goose and Swan Functional Land.' This is considered to be a suitably precautionary approach.

In considering the predicted impacts and assessing the potential effects we have, in line with guidance and case law, given the most weight to the formal conservation objectives which are clearly set out for each designation under the relevant project AA.

3.3.2 Potential effects considered as part of the HRA

Based on UKWIR (2021) guidance and given the nature of the selected options, the effects considered in this assessment are summarised in Table 3.2. Proposed zones of influence (ZoI) are also provided following the same guidance to determine if, where a pathway has been identified, the effect may adversely affect the habitats or species for which the Habitats Site(s) are designated.

Table 3.2: Potential effects and proposed Zone of Influence

Broad categories of potential effects on Habitats Sites (with examples)	Examples of operations resulting in effects and proposed ZoI
Physical loss Destruction (including offsite effects) e.g. foraging habitat, smothering	Development of built infrastructure associated with the schemes, e.g. reservoir embankments and access routes[9]. Physical loss is only likely to be significant where the boundary of the option extends within the boundary of the Habitats Site, or within an offsite area of known foraging, roosting, breeding habitat (that supports species for which a Habitats Site is designated or where natural processes link the option to the site, such as through hydrological connectivity downstream, or the scheme effects the linking habitat).
Physical damage Habitat degradation Erosion Trampling Fragmentation Severance/barrier effects Edge effects	Development of built infrastructure associated with the schemes, e.g. reservoir embankments and access routes. Physical loss is only likely to be significant where the boundary of the option extends within the boundary of the Habitats Site, or within an offsite area of known foraging, roosting, breeding habitat (that supports species for which a Habitats Site is designated or where natural processes link the option to the site, such as through hydrological connectivity downstream, or the scheme effects the linking habitat).
Non-physical disturbance Noise Visual presence Light pollution	**Noise from construction activities.** Taking into consideration the noise level generated from general building activity (c. 122dB(A)) and considering the lowest noise level identified in guidance as likely to cause disturbance to waterbird species (although this guidance is designed primarily for estuarine birds it was considered

[8] Chapman, C. & Tyldesley, D. 2016. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions. Natural England Commissioned Reports, Number207.

[9] It is acknowledged that infrastructure associated with the construction of the reservoirs may have an impact on Habitats Sites. However, for the purposes of this informal HRA, only the construction footprint of the reservoir itself has been used to determine the potential for significant effects.

Broad categories of potential effects on Habitats Sites (with examples)	Examples of operations resulting in effects and proposed ZoI
	appropriate to use for this plan), it is concluded that noise effects could be significant up to **1km** from the boundary of the Habitats Site. **Noise from vehicular traffic during construction of the scheme** Noise from construction traffic is only likely to be significant where the transport route to and from the scheme is within **500m** of the boundary of the Habitats Site(s). **Plant and personnel involved in operation of the option** These effects (noise, visual/human presence) are only likely to be significant where the boundary of the scheme extends within or is adjacent to an offsite area of known foraging, roosting, breeding habitat that support species for which a Habitats Site is designated. **Options that might include artificial lighting,** e.g. for security around a temporary pumping station. Effects from light pollution are more likely to be significant where the boundary of the scheme is within **500m** of the boundary of the Habitats Site
Water table/ availability Drying Flooding/storm water Changes to surface water levels and flows Changes to groundwater level and flows	Change to water levels and flows due to water abstraction, storage and drainage interception associated with inland options. These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the scheme and the Habitats Site and whether the scheme is up or downstream from the Habitats Site.
Toxic contamination Water pollution Soil contamination Air pollution	**Reduced dilution in downstream or receiving waterbodies due to changes in abstraction or reduced compensation flow releases to river systems.** These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the scheme and the Habitats Site, and sometimes whether the scheme is up or downstream from that site. Air emissions associated with plant and vehicular traffic during construction and operation of the scheme. The effect of dust is only likely to be significant where site is within or in close proximity to the boundary of a Habitats Site. Without mitigation, dust can be deposited onto the public road network and then spread by vehicles on roads up to 500m from large sites, 200m from medium sites, and 50m from small sites as measured from the site exit. Effects of road traffic emissions from the transport route to be taken by the scheme traffic are only likely to be significant where the Habitats Site falls within 200 metres of the edge of a road affected.
Non-toxic contamination Nutrient enrichment (e.g. of soils and water) Algal blooms Changes in turbidity Changes in sedimentation/silting Air pollution (dust)	**Changes to water salinity, nutrient levels, turbidity, thermal regime due to increased water abstraction, discharges, storage, or reduced compensation flow releases to river systems.** These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the scheme and the Habitats Site, and sometimes whether the scheme is up or downstream from that site. Emissions of dust during the earthworks, construction of plant and tunnel/pipeline construction associated with options.

Broad categories of potential effects on Habitats Sites (with examples)	Examples of operations resulting in effects and proposed ZoI
Biological Disturbances Direct mortality Changes to habitat availability Changes in species abundance or distribution Out-competition by non-native species Introduction of disease Introduction of invasive species	**Killing or injury due to construction activity.** Likely to be a risk where the boundary of the scheme extends within or is directly adjacent to the boundary of the Habitats Site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a Habitats Site is designated). **Changes in habitat availability, such as reductions in wetted width of rivers from abstraction or reduced compensation flow.** These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the scheme and the Habitats Site, and sometimes whether the scheme is up or downstream from that site. **Creation of new pathway for spread of non-native invasive species.** This effect is only likely to be significant where the scheme is situated within the Habitats Site or an upstream tributary of the Habitats Site, but also for inter-catchment water transfers.

Source: Adapted from: UK Water Industry Research (2021)[10].

3.3.3 Consultation

Stakeholder consultation is summarised in the updated dWRMP24 Customer and Stakeholder Summary document. It should be noted for the purposes of this AA that Natural England has been engaged with during the development of the updated dWRMP24 in December 2022, March 2023 and August 2023.

3.3.4 Assumptions and standard best-practice mitigation measures

3.3.4.1 Assumptions

The high-level nature of this assessment undertaken at the plan stage means that there is a lack of detailed design. By law, any scheme being taken forward to be implemented will be subject to an Appropriate Assessment at the project stage, when, in the light of more information relating to the construction and design of the scheme, a more refined HRA assessment can be undertaken.

The approach in this assessment is to minimise the additional assumptions that have to be made, which, in practice, means relying on existing data, evidence and decisions. The assessment aims to reasonably predict the effects of the plan in a way that allows the assessment to inform the development of the plan options. It is considered that a reasonable assessment can be performed if:

- Effect pathways can be identified, and it is possible to determine which Habitats Sites are likely to be affected and how;
- The magnitude of those effects can be estimated using existing information about the distribution, abundance and conservation status of those features and the nature of the option envisaged within the plan; and
- The effects thus quantified can be related to the conservation objectives of the Habitats Site and a proportionate and precautionary conclusion can be formed, with reasonable certainty, about whether an adverse effect on site integrity can be excluded or not.

[10] UK Water Industry Research (UKWIR, 2021). *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15).*

It is recommended that SWW works closely with Natural England and the Habitats Sites' owners/managers to agree the specific mitigation measures to be included at the project stage HRA. The agreed mitigation measures will be expected to form part of planning conditions and/or conditions of relevant environmental permits, and their implementation managed through contractual obligations.

3.3.4.2 Best practice measures during construction

Based on the current level of detail available for the updated dWRMP24, a number of established industry-wide best practice measures and mitigation which have all been implemented on consented nationally significant infrastructure projects (NSIPs) to address common risks in the construction and development sectors are assumed for all supply options. Therefore, there is practical certainty they can be implemented and in place at the relevant time when the project level HRA is undertaken. The full implementation of these measures, together with any site-specific efficacy research, will be secured and enforced as it has on other projects, within the project planning process.

Whilst these measures will be integrated into construction of the final option, they have not been included within the Stage 1 screening of the options to alleviate adverse environmental effects. Instead, they will be applied during the Stage2 AA and treated as targeted mitigation.

Best practice for the design, pollution control, biosecurity, disturbance, and the Construction and Environmental Management Plan (CEMP) includes:

Option design

- Should design be altered, every opportunity for avoiding potential effects on Habitats Sites (e.g. through alternative pipeline routes, micro-siting, etc.) should be taken.

Pollution control

- Indirect construction-related pollution is identified as one key pathway through which Habitats Sites may be affected. There is numerous guidance on environmental good practice measures during construction which can be relied on (at this level) to prevent significant adverse effects on a designated site occurring. The best-practice procedures detailed in the following documents should be followed for all construction works derived from this option, as a minimum standard:
  - CIRIA C741 *Environmental good practice on site guide* (Charles and Edwards, 2015)[11]
  - CIRIA C532 *Control of water pollution from construction sites* (Masters-Williams *et al.* 2001)[12]
  - Environment Agency's Pollution Prevention Guidance (PPG) Notes[13] including PPG1: *General Guide to Prevention of Pollution* (July 2013); PPG5: *Works and maintenance in or near water* (October 2007), PPG6: *Pollution prevention guidance for working at construction and demolition sites* (April 2010); PPG21: *Pollution incident response planning* (March 2009); PPG22: *Dealing with spills* (April 2011).

[11] Charles P. and Edwards P (2015) Environmental good practice on site guide. CIRIA C741, 260p.

[12] Masters-Williams H., Heap A., Kitts H. *et al.* (2001) *Control of water pollution from construction sites*. CIRIA C532, 27p.

[13] Note, the Environment Agency Pollution Prevention Guidance Notes have been withdrawn by the Government, although the principles within them are robust and still form a reasonable basis for pollution prevention measures. Documents are still available online at: [ARCHIVED CONTENT] Environment Agency - Pollution prevention advice and guidance (PPG) (nationalarchives.gov.uk) (last accessed April 2022).

- The installation of sediment traps near or in watercourses or the use of cofferdams should be specified at the project stage.
- Compliance with the provisions of the Health and Safety at Work Act 1974, the Environmental Protection Act 1990, the Environment Act 1995, the Clean Air Act 1993, and the regulations made thereunder, including the Control of Substances Hazardous to Health Regulations (SI 2002/2677) with regard to air quality management.
- Mitigation plans to help mitigate air quality impacts to support this should include an Air Quality/Dust Management Plan and a Construction Traffic Management Plan (CTMP).

Biosecurity

- Biosecurity measures will be in place to ensure the management of invasive non-native species on construction sites and during controlled activities. The following considerations will be given pre-construction:
  - Invasive non-native species (INNS) risk assessment to be undertaken at site feasibility stage;
  - Where INNS are identified, legal requirements and mitigation plan developed at early planning stage;
  - INNS to be included on all site method statements including CEMP and any Ecological Protection Plans. INNS risk to be managed by Ecological Clerk of Works (ECoW) and INNS brief given to all site contractors; and
  - Where a species requires long-term management (such as Japanese knotweed *Reynoutria japonica syn. Fallopia japonica*), a specific INNS management plan will be developed.
- The best-practice procedures detailed in the following documents should be followed to reduce the spread of INNS for all construction works derived from these options, as a minimum standard:
  - CIRIA Manual C679 'Invasive species management for infrastructure managers and the construction industry'; The Knotweed Code of Practice – managing Japanese Knotweed on development sites'.

Disturbance - noise

- Construction activities will be conducted in accordance with noise limits to avoid disturbance.
- Construction related noise disturbance will be minimised by implementing best practice such as BS 5228-1:2009+A1:2014 (The British Standards Institute, 2008)[14].

Disturbance - light

- Lighting will be kept to a minimum to reduce disturbance. Should the works be undertaken at night and flood lighting required, lighting should be kept to a minimum, and hooded spotlights directed away from potentially suitable habitat for qualifying species of Habitats Sites, to reduce disturbance while ensuring standards for health and safety.
- The potential impact of artificial light may be minimised through the implementation of best practice such as '*Guidance Notes for the Reduction of Obtrusive Light*' (Institute of Lighting

[14] The British Standards Institute, 2008. BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites. Noise. BSI Standards Limited, London.

Professionals, 2011)[15] and *'Guidance Note 08/23 Bats and Artificial Lighting at Night'* (Bat Conservation Trust and Institute of Lighting Professionals, 2023)[16].

Construction Environmental Management Plan

The design of the measures within the CEMP will be based on the anticipated site conditions and construction methods whilst also allowing for a precautionary margin of error to account for extreme events, such as unprecedented rainfall which could increases the risk of flooding and pollution. The efficacy of the mitigation measures will be monitored and evaluated by the construction site environmental manager during the construction phase to inform adaptive management.

3.3.4.3 Best practice measures during operation

There are no assumptions relating to best practice or otherwise during the operation of the final option. No best practice measures are recommended in this document to reduce significant effects or adverse effects on Habitats Sites during operation. These will be tailored to each supply option as required, and are likely to require additional information, assessments and/or monitoring at the project level to inform the extent of potential adverse effects during operation.

Whilst it is not possible for the updated dWRMP24 assessment to reasonably predict the effects on the Habitats Sites in a detailed way, as a lower tier plan to the South West river basin district (RBD) River Basin Management Plan (RBMP), which is the principal safeguard related to river basin management, the updated dWRMP24 contains measures and future studies that would ensure compliance with the policies of the RBMP. The operational limits of abstraction of groundwater or surface water which may have adverse effects on a Habitats Site will be constrained by the updated RBMP[17]. With respect to flows and water levels and quality, the RBMP aims to sustain geomorphological processes, meet the hydro-ecological requirements of the constituent species and dilute contaminants. The environmental objectives in the RBMP are legally binding once the plan is approved by Secretary of State for Environment, Food and Rural Affairs. All public bodies (e.g. South West Water) must have regard to these objectives when making decisions that could affect the quality of the water environment. The environmental objectives of the RBMP include, *inter alia*: preventing deterioration of the status of surface waters and groundwater; achieving objectives and standards for protected areas; and aiming to achieve good status for all water bodies.

3.4 Option screening summary

A summary of the HRA Stage 1 Screenings for all assessed supply and drought options currently considered feasible for the WRMP24 is provided within Table 3.3 below and detailed in Sections 4 to 25 hereafter. Details of the Habitats Sites' qualifying features and conservation objectives are provided for all supply and drought options within Appendix B.

[15] Institution of Lighting Professionals (2020). Guidance note for the reduction of obtrusive light. Guidance Note1/20.

[16] Bat Conservation Trust and Institute of Lighting Professionals (2023). Guidance Note 08/23 Bats and Artificial Lighting at Night. Available at: Guidance Note 8 Bats and Artificial Lighting | Institution of Lighting Professionals (theilp.org.uk)

[17] UK Government (2022). South West river basin district river basin management plan: updated 2022. Available at: South West river basin district river basin management plan: updated 2022 - GOV.UK (www.gov.uk)

Table 3.3: HRA summary for all feasible WRMP options

WRZ	Option ID	Option title	Screening conclusion	BVP	Best Environment & Society	Least Cost	Ofwat Core	Adaptive Pathway Medium	Adaptive Pathway High
Bournemouth	BNW1	Borehole development, existing borehole remedial works	Potential for significant effects – Stage 2 required	Yes	Yes	No	Yes	Yes	Yes
	BNW6	Longham Aquifer Recharge	Potential for significant effects – Stage 2 required	Yes	Yes	No	Yes	Yes	Yes
	BNW7	Mendips Quarry – Raw water transfer and augmentation of the River Stour	SRO option, assessed separately. Potential for significant effects – Stage 2 required	Yes	Yes	Yes	Yes	Yes	Yes
	BNW8	Poole Harbour FE-reuse	SRO option, assessed separately. Potential for significant effects – Stage 2 required.	Yes	Yes	Yes	Yes	Yes	Yes
	BNW14	Ibsley Lake	Potential for significant effects – Stage 2 required	Yes	Yes	No	Yes	Yes	Yes
	BNW16	Christchurch and Holdenhurst WwTW IPR 3 - Further treatment and transfer to Knapp Mill WTW	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	BNW17	Cheddar 2 New Strategic Regional Reservoir and Transfer	SRO option, assessed separately. Potential for significant effects – Stage 2 required.	No	No	No	No	No	No
	BNW18	Alderney WTW - Reduce Treatment Losses	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	BNW19	Knapp Mill WTW - Reduce Treatment Losses	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	dB1	Wimborne Borehole	Potential for significant effects – Stage 2 required	No	No	Yes	No	No	No
	dB2	Stanbridge Licence	Potential for significant effects – Stage 2 required	No	No	Yes	No	No	No

WRZ	Option ID	Option title	Screening conclusion	BVP	Best Environment & Society	Least Cost	Ofwat Core	Adaptive Pathway Medium	Adaptive Pathway High
Colliford	COL2	Colliford PS Stage 2 - River Camel Abstraction.	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	COL3	Abstraction of Colliford compensation flows when making supply releases	No Likely Significant Effects	No	No	No	No	No	No
	COL4	Abstraction of Siblyback compensation flows when making supply releases	No Likely Significant Effects	No	No	No	No	No	No
	COL5	Increase Wendron annual licence and de-couple from Stithians	No Likely Significant Effects	No	No	No	No	No	No
	COL6	River Hayle Abstraction	No Likely Significant Effects	No	No	No	No	No	No
	COL9	Leswidden Pool	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	COL15	Restormel WTW – increase treatment capacity to 110 Ml/dMl/d	No Likely Significant Effects	Yes	Yes	No	Yes	Yes	Yes
	COL16	College WTW Improvements - treatment and distribution system	No Likely Significant Effects	No	No	No	No	No	No
	COL19	Boswyn Stream/Cargenwen Reservoir/Carwynnen Stream	No Likely Significant Effects	No	No	No	No	No	No
	COL20	River Fal new abstraction	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	COL21	South Crofty & Wheal Jane - Mine Water Reclamation	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	COL22	Roadford to Colliford via Saltash	Potential for significant effects – Stage 2 required	No	No	No	No	Yes	Yes
	COL23	Mayflower WTW to Kit Hill (St. Cleer)	Potential for significant effects – Stage 2 required	No	No	No	No	No	No

WRZ	Option ID	Option title	Screening conclusion	BVP	Best Environment & Society	Least Cost	Ofwat Core	Adaptive Pathway Medium	Adaptive Pathway High
	COL24	Northcombe WTW to Launceston	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	COL25	Brent Tor to Launceston	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	COL26	Restormel WTW to East Cornwall	No Likely Significant Effects	No	No	No	No	No	No
	COL28	Desalination Plant at Par	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	COL29	Restormel WTW - Increase Treatment Capacity to 120 Ml/dMl/d	No Likely Significant Effects	No	No	No	No	No	No
	dCS1/E	Colliford not releasing compensation flows when making supply releases	No Likely Significant Effects	No	No	No	No	No	No
	dCS11/E	Siblyback not releasing compensation flows when making supply releases	No Likely Significant Effects	No	No	No	No	No	No
	dC1	Restormel Licence	EAR option, assessed separately. Outcome of the HRA currently unknown.	No	No	No	No	No	No
	dC2	Stannon Lake Licence	EAR option, assessed separately. Outcome of the HRA currently unknown.	No	No	No	No	No	No
	dC3	Porth Reservoir and Rialton Intake	EAR option, assessed separately. Outcome of the HRA currently unknown.	No	No	No	No	No	No
	dCS2/E	Park Lake Licence	EAR option, assessed separately. Outcome of the HRA currently unknown.	No	No	No	No	No	No
	dCS3/E	Blackpool Pit	EAR option, assessed separately. Outcome of the HRA currently unknown.	No	No	No	No	No	No

WRZ	Option ID	Option title	Screening conclusion	BVP	Best Environment & Society	Least Cost	Ofwat Core	Adaptive Pathway Medium	Adaptive Pathway High
	dCS6/E	Hawks Tor Pit	EAR option, assessed separately. Outcome of the HRA currently unknown.	No	No	No	No	No	No
Roadford	ROA2	River Erme	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	ROA3	River Yealm	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	ROA4	Abstraction of Roadford compensation flow at Gunnislake when making supply releases	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	ROA6	Upper Tamar Lake increasing annual licence	No Likely Significant Effects	No	No	No	No	No	No
	ROA7	Expansion of Northcombe WTW to 60 Ml/dMl/d	No Likely Significant Effects	No	No	No	No	Yes	Yes
	ROA12	Slade and Horedown WTW (GAC)	No Likely Significant Effects	No	No	No	No	No	No
	ROA13	Duckaller and Vennbridge	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	ROA14	Raise Avon Dam	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	ROA15	Gatherley Phase 2	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	ROA17	Littlehempston WTW	Potential for significant effects – Stage 2 required	No	No	No	No	Yes	Yes
	ROA19	Cheddar 2 to Prewley - New Strategic Regional Reservoir, Treatment and Transfer	SRO option, assessed separately. Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	ROA20	Mayflower WTW to Littlehempston WTW	Potential for significant effects – Stage 2 required	No	No	No	No	No	No

WRZ	Option ID	Option title	Screening conclusion	BVP	Best Environment & Society	Least Cost	Ofwat Core	Adaptive Pathway Medium	Adaptive Pathway High
	ROA21	Roborough to Littlehempston WTW	Potential for significant effects – Stage 2 required	Yes	Yes	Yes	Yes	Yes	Yes
	dR2	Slade Reservoir	No Likely Significant Effects	No	No	No	No	No	No
	dR3	Challacombe Reservoir	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	dR4	Meldon/Vellake to Roadford	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	dR5	Lee Moor unused quarries	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	dRS15/E	Roadford not releasing compensation flows when making supply releases	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	dRS1/E	River Lyd (Summer)	EAR option, assessed separately. Outcome of the HRA currently unknown.	No	No	No	No	No	No
Wimbleball	WIM1	Abstraction of Wimbleball compensation flow at Northbridge when making supply releases	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	WIM2	Sidford borehole commissioning	No Likely Significant Effects	No	No	No	No	No	Yes
	WIM4	Wilmington springs annual abstraction increase	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	WIM5	Indirect potable reuse – stream support for Dotton WTW	Potential for significant effects – Stage 2 required	No	No	Yes	No	Yes	Yes
	WIM6	Increase Allers WTW capacity	No Likely Significant Effects	No	No	No	No	No	No
	WIM7	Increase Pynes to licence limit 66.46 Ml/dMl/d	Potential for significant effects – Stage 2 required	No	No	No	No	No	No

WRZ	Option ID	Option title	Screening conclusion	BVP	Best Environment & Society	Least Cost	Ofwat Core	Adaptive Pathway Medium	Adaptive Pathway High
	WIM8	Bramford Speke borehole	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	WIM9	Stoke Canon borehole	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	WIM11	Couchill Springs, Seaton	Potential for significant effects – Stage 2 required	No	No	Yes	No	No	Yes
	WIM12	Allers Springs	No Likely Significant Effects	No	No	Yes	No	No	Yes
	WIM13	Cheddar 2 to Parsonage - New Strategic Regional Reservoir, Treatment and Transfer	SRO option, assessed separately. Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	WIM14	Whitecross Distribution Upgrade	Potential for significant effects – Stage 2 required	Yes	Yes	Yes	Yes	Yes	Yes
	WIM15	Northcombe WTW to Allers WTW	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	WIM16	FE reuse - Countess Wear and Mear Lane WwTW to River Exe	Potential for significant effects – Stage 2 required	No	No	No	No	No	No
	WIM18	Cheddar 2 to Bickham Moor - New Strategic Regional Reservoir, Treatment and Transfer	SRO option, assessed separately. Potential for significant effects – Stage 2 required	Yes	Yes	No	Yes	Yes	Yes
	dW1	Brampford Speke and Stoke Canon (North Exeter Boreholes)	Potential for significant effects – Stage 2 required	Yes	Yes	Yes	Yes	Yes	Yes
	dW2	Hook Springs Licence	Potential for significant effects – Stage 2 required	Yes	Yes	Yes	Yes	Yes	Yes
	dW3	Wilmington Springs Licence	Potential for significant effects – Stage 2 required	Yes	Yes	Yes	Yes	Yes	Yes
	dW4	Wimbleball not releasing compensation flows when making supply releases	Potential for significant effects – Stage 2 required	Yes	Yes	Yes	Yes	Yes	Yes

Source: Mott MacDonald Limited, 2023

4 BNW1 Borehole development, existing borehole remedial works

4.1 Stage 1 Screening

The Stage 1 Screening identified eight Habitats Sites within the ZoI of BNW1 (Table 4.1). LSE could not be ruled out for six of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 4.1: BNW1 Stage 1 Screening results

Potential for Significant Effects	No Likely Significant Effects
Solent and Southampton Water SPA (approximately 30m east)	Solent and Isle of Wight Lagoons SAC (approximately 3.1km south)
Solent and Southampton Water Ramsar (approximately 30m east)	New Forest Ramsar (approximately 1.8km north-east)
The New Forest SAC (approximately 1.6km north-east)	
New Forest SPA (approximately 1.8km north-east)	
Solent Maritime SAC (approximately 2km south-east)	
Solent and Dorset Coast SPA (approximately 4km south-east)	

Source: Mott MacDonald Limited, 2023

4.1.1 Solent and Southampton Water SPA

This site is hydrologically connected to the option via the WFD groundwater waterbody ID GB40702G503500 (SW Hants Barton Group). This site has been identified as a groundwater-dependent terrestrial ecosystem (GWDTE), meaning it is ecologically sensitive to changes in groundwater levels and/or chemistry.

Due to this hydrological connectivity, it is possible that any pollution events (toxic or non-toxic) could be transferred within and throughout the SPA boundary and impact qualifying features. Habitats which support qualifying features, such as reedbeds, wet woodland, floodplain grazing marsh, coastal saltmarsh and mudflats, may be degraded through pollution, as could the availability of prey within these habitats for which qualifying features rely; these food resources and refuges may be lost and result in changes to the population sizes and distribution of qualifying features within or from the site. Non-toxic pollution events during construction can lead to increases in suspended sediment which can result in dissolved oxygen sags and increased turbidity. This could have temporary impacts on the spatial distribution of sediments and topographic features within the river channel. The deposition of excess sediments could also smother benthic communities, reducing the habitat mosaic and creating anoxic conditions. The incidental release of pollutants during construction could increase contaminant levels in the water column and sediment, which over time could bioaccumulate into species present. These effects could temporarily reduce habitat suitability and prey availability for qualifying features. Construction works can also facilitate the spread of invasive non-native species into the SPA.

During construction of the new borehole, there may temporary dewatering which reduces the local groundwater levels and subsequently affects the base flow of the Lymington River. Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are

no longer suitable for the colonisation of supporting habitats' pioneer species, such as excessive nutrient loading. These effects are anticipated to be temporary during the construction period but may result in displacement of qualifying features from preferred roosting and foraging areas within the SPA.

There is the potential for significant effects from increased exposure to air pollution (dust and nitrogen oxides associated with construction vehicles). Based on publicly available data from 2020 (2019 – 2021 three-year average)[18], nitrogen deposition at the site is 10.2kg/ ha/ year on average with a critical load of 20 - 30kg/ ha/ year on coastal and floodplain grazing marsh, although there is no critical load for the watercourse itself or reedbeds. Both nitrogen oxides and sulphur dioxide are below the critical level with nitrogen oxides at 9.8µg m^{-3} with a critical level of 30µg m^{-3} and sulphur dioxides at 1µg m^{-3} with a critical level of 10 – 20µg m^{-3}. Ammonia levels at the site are within the critical load range, although they do not exceed the maximum; current levels are 1 µg m^{-3} with a critical load range of 1 - 3µg m^{-3}. Therefore, it is not anticipated that construction works will have a significant effect on air quality in relation to the Habitats Sites critical loads and levels.

Due to the proximity of the option to the Lymington River Reedbeds SSSI and Lymington River SSSI components of the SPA, there may be indirect effects to qualifying species through disturbance; noise, visual and artificial light are all sources of disturbance which could affect overwintering birds when roosting or foraging. Disturbing effects can result in changes to behaviours, increased energy expenditure due to fleeing, and desertion of supporting habitat. Disturbance to qualifying species when foraging or roosting may jeopardise adult fitness and overwinter survival. Due to the distance between the option and the Hurst Castle and Lymington Estuary SSSI component of the SPA, qualifying species which primarily use the estuarine habitats are not anticipated to be at risk of construction-related disturbance. This includes qualifying breeding Mediterranean gull *Larus melanocephalus*, little tern *Sternula albifrons*, roseate tern *Sterna dougallii*, common tern *Sterna hirundo* and sandwich tern *Sterna sandvicensis*, which are coastal and marine specialists which are unlikely to regularly use the reedbed and grazing marsh habitats further upstream.

No significant effects are anticipated on the components of the SPA on the Isle of Wight, due to their distance from the option and additional dilution of any pollutants within the English Channel. No other impact pathways have been identified during construction.

No impact pathways are identified during operation of the new borehole, under the assumption that the target aquifer for abstraction is deep confined and there is no connection with the upper groundwater catchment or surrounding surface watercourses.

Likely significant effects cannot be ruled out on the Solent and Southampton Water SPA during construction. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

4.1.2 Solent Maritime SAC

This site is hydrologically connected to the option via the WFD groundwater waterbody ID GB40702G503500 (SW Hants Barton Group) and downstream on the Lymington River. This site has been identified as a GWDTE, meaning it is ecologically sensitive to changes in groundwater levels and/or chemistry.

Due to this hydrological connectivity, it is possible that any pollution events (toxic or non-toxic) could be transferred to within the SAC boundary, either through the groundwater or the Lymington River, and impact qualifying features. Annex I habitats may be degraded through pollution, and habitats which support Desmoulin's whorl snail *Vertigo moulinsiana*, resulting in

[18] Air Pollution Information System (2021). Site Relevant Critical Loads and Source Attribution (APIS GIS map tool). Accessed from: APIS app | Air Pollution Information System

changes to the overall extent, distribution and population sizes within the SAC boundary. Non-toxic pollution events during construction can lead to increases in suspended sediment which can result in dissolved oxygen sags and increased turbidity. This could have temporary impacts on the spatial distribution of sediments and topographic features within the river channel. The deposition of excess sediments could also smother benthic communities, reducing the habitat mosaic and creating anoxic conditions. The incidental release of pollutants during construction could increase contaminant levels in the water column and sediment, which also damages qualifying habitats and habitats which supports Desmoulin's whorl snail. Construction works can also facilitate the spread of invasive non-native species into the SAC, which could outcompete native species. All of these effects may result in changes to the overall extent and distribution of Annex I habitats and jeopardise the conservation objectives of the SAC.

During construction of the new borehole, there may temporary dewatering which reduces the local groundwater levels and subsequently affects the base flow of the Lymington River. Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for the colonisation of qualifying habitats' pioneer species, such as excessive nutrient loading. These effects are anticipated to be temporary during the construction period but may result in damage to qualifying habitats.

No significant effects are anticipated on the components of the SAC on the Isle of Wight, due to their distance from the option and additional dilution of any pollutants within the English Channel. Due to the distance between the option and the SAC, no other impact pathways have been identified during construction.

No impact pathways are identified during operation of the new borehole, under the assumption that the target aquifer for abstraction is deep confined and there is no connection with the upper groundwater catchment or surrounding surface watercourses.

Likely significant effects cannot be ruled out on the Solent Maritime SAC during construction. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

4.1.3 Solent and Southampton Water Ramsar

The hydrological connection between this option and the Ramsar is the same as described for the Solent and Southampton Water SPA, as these sites' boundaries are identical. The impact pathways described above may result in the temporary degradation of habitats which are suitable for supporting qualifying overwintering bird species. British Red Data Book (RDB) invertebrate and plant species, qualifying features under Ramsar criterion 2, may also be degraded and/or temporarily displaced through the same pollution pathways. The construction-related disturbance to qualifying features present within the Lymington River Reedbeds SSSI and Lymington River SSSI is as described for the SPA above. No significant effects from pollution are anticipated, with details on the baseline levels and critical loads described above.

Wetland and estuarine habitats which are qualifying features under Ramsar criterion 1 may be temporarily degraded through the same impact pathways as described for the Solent Maritime SAC above.

No significant effects are anticipated on the components of the Ramsar on the Isle of Wight, due to their distance from the option and additional dilution of any pollutants within the English Channel. No other impact pathways have been identified during construction.

No impact pathways are identified during operation of the new borehole, under the assumption that the target aquifer for abstraction is deep confined and there is no connection with the upper groundwater catchment or surrounding surface watercourses.

Likely significant effects cannot be ruled out on the Solent and Southampton Water Ramsar during construction. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

4.1.4 The New Forest SAC

This site is hydrologically connected to the option via the WFD groundwater waterbody ID GB40702G503500 (SW Hants Barton Group). This site has been identified as a GWDTE, meaning it is ecologically sensitive to changes in groundwater levels and/or chemistry. The only part of the SAC which is connected via the groundwater catchment is unit 505 of the underpinning The New Forest SSSI. This unit is typically dry, with only a small amount of wet heath and mire and is currently in favourable condition.

Due to this hydrological connectivity, it is possible that any pollution events (toxic or non-toxic) could be transferred to within the SAC boundary and impact qualifying features. Annex I habitats may be degraded through pollution, resulting in changes to the extent and distribution of qualifying features within the site. Water pollution is listed as a pressure on qualifying Annex I habitats within the New Forest Site Improvement Plan (SIP)[19].

During construction of the new borehole, there may temporary dewatering which reduces the local groundwater levels. Reduced water level, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for the colonisation of qualifying Annex I habitats' pioneer species, such as excessive nutrient loading. These effects are anticipated to be temporary during the construction period but may result in changes to overall extent and distribution of qualifying habitats within the SAC.

The potential significant effects of groundwater pollution and water table availability are only anticipated on the following qualifying Annex I habitats: European dry heaths, depressions on peat substrates and *Molinia* meadows. None of the other qualifying features are recorded as present within unit 505, within the connected groundwater catchment (SW Hants Barton Group). Due to the distance between the SAC and this option (1.6km), no other impact pathways have been identified during construction.

No impact pathways are identified during operation of the new borehole, under the assumption that the target aquifer for abstraction is deep confined and there is no connection with the upper groundwater catchment or surrounding surface watercourses.

Likely significant effects cannot be ruled out on The New Forest SAC during construction. As such this SAC has been progressed to Stage 2 Appropriate Assessment.

4.1.5 New Forest SPA

The hydrological connection between this option and the SPA is the same as described for The New Forest SAC, as these sites' boundaries are very similar. Therefore, potential pollution events and temporary reductions in groundwater level during construction may affect habitats which support the qualifying features. The following habitats are present within the SPA boundary, and the connected groundwater catchment (SW Hants Barton Group): broadleaved woodland, heath, acid and calcareous grasslands. These habitats are suitable for supporting all of the qualifying features of the SPA, and damage to them, albeit temporary, may result in short-term displacement of qualifying features from preferred roosting and foraging areas.

The same impact pathways may damage or degrade functionally linked habitats outside of the SPA boundary, such as the reedbed, wet woodland and floodplain grazing marsh within the Lymington River Reedbeds SSSI and Lymington River SSSI adjacent to the option. This is

[19] Natural England (2014). Site Improvement Plan: New Forest (SIP147). Available at: Site Improvement Plan: New Forest - SIP147 (naturalengland.org.uk)

suitable foraging habitat for overwintering hen harrier *Circus cyaneus* and breeding hobby *Falco Subbuteo*, both qualifying features of the SPA. Other woodland habitats outside of the SPA boundary exist within the connected groundwater catchment, which could be functionally linked habitat for hobby, honey buzzard *Pernis apivorus* and wood warbler *Phylloscopus trochilus*.

Due to the proximity of the option to the Lymington River Reedbeds SSSI and Lymington River SSSI components of the SPA, there may be indirect effects to qualifying species through disturbance in functionally linked habitats; noise, visual and artificial light are all sources of disturbance which could affect overwintering hen harrier and breeding hobby when foraging. Disturbing effects can result in changes to behaviours, increased energy expenditure due to fleeing, and desertion of supporting habitat. Disturbance to qualifying species when foraging or roosting may jeopardise adult fitness, breeding success, overwinter survival and/or future population viability associated with the SPA. Disturbance from construction activities is not anticipated on the other qualifying features, which are unlikely to be present within the habitats surrounding this option.

It is not anticipated that there will be any significant effects from reduced air quality within functionally linked land, as detailed within the Solent and Southampton Water SPA section above.

Due to this distance between the SPA and this option (1.8km), no other impact pathways have been identified during construction.

No impact pathways are identified during operation of the new borehole, under the assumption that the target aquifer for abstraction is deep confined and there is no connection with the upper groundwater catchment or surrounding surface watercourses.

Likely significant effects cannot be ruled out on the New Forest SPA during construction. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

4.1.6 New Forest Ramsar

The hydrological connection between this option and the Ramsar is the same as described for The New Forest SAC, as these sites' boundaries are very similar. Although this site is a GWDTE, and therefore sensitive to change in groundwater levels and chemistry, it is not anticipated that the qualifying features of the Ramsar will be significantly affected by this option.

As detailed within The New Forest SAC section above, the habitats within the connected groundwater catchment are European dry heaths, depressions on peat substrates and *Molinia* meadows. None of the wetland habitats identified within Ramsar criteria 1 or 3, valley mires and wet heaths, are present within the option's zone of influence (ZoI). Similarly, criterion 2 concerns assemblages of wetland plants and invertebrates, with none of the Ramsar's wetland habitats within the ZoI. As a result, no significant effects are anticipated during construction.

No impact pathways are identified during operation of the new borehole, under the assumption that the target aquifer for abstraction is deep confined and there is no connection with the upper groundwater catchment or surrounding surface watercourses.

It is considered that no likely significant effects are anticipated on the New Forest Ramsar. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Ramsar or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

4.1.7 Solent and Dorset Coast SPA

This site is hydrologically connected to the option downstream on the Lymington River and the English Channel. Due to this hydrological connectivity, it is possible that any pollution events (toxic or non-toxic) could be transferred downstream to within the SPA boundary and impact qualifying features. Pollution within the coastal environment may affect the availability of prey within these habitats for which qualifying features rely; these food resources may be lost and result in changes to the population sizes and distribution of qualifying features within or from the site. Non-toxic pollution events during construction can lead to increases in suspended sediment which can result in dissolved oxygen sags and increased turbidity. This could have temporary impacts on the spatial distribution of sediments and topographic features within the river channel. The deposition of excess sediments could also smother benthic communities, reducing the habitat mosaic and creating anoxic conditions. The incidental release of pollutants during construction could increase contaminant levels in the water column and sediment, which over time could bioaccumulate into species present. These effects could temporarily reduce prey availability for qualifying features.

It is assumed that habitats within the Lymington Estuary outside of the SPA boundary are functionally linked foraging areas for the qualifying tern species during the breeding season. The impact pathways described above may also have significant effects on functionally linked foraging areas, as they are closer to the option and the source of any pollution events. During construction of the new borehole, there may temporary dewatering which reduces the local groundwater levels and subsequently affects the base flow of the Lymington River. Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for preferred prey of the qualifying features, such as excessive nutrient loading. These effects are anticipated to be temporary during the construction period but may result in displacement of qualifying features' prey from preferred foraging areas within and outside of the SPA boundary, thus displacing the qualifying features themselves.

As the qualifying features of the SPA are coastal and marine specialists, habitats such as reedbeds and grazing marsh closer to the option upstream on the Lymington River are not considered to be functionally linked to this site. Therefore, no disturbance effects from construction activities are anticipated.

Due to the distance between this option and the SPA, no other impact pathways have been identified during construction.

No impact pathways are identified during operation of the new borehole, under the assumption that the target aquifer for abstraction is deep confined and there is no connection with the upper groundwater catchment or surrounding surface watercourses.

Likely significant effects cannot be ruled out on the Solent and Dorset Coast SPA during construction. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

4.1.8 Solent and Isle of Wight Lagoons SAC

There is no direct hydrological connection between this option and the SAC, as they are within different groundwater catchments and the SAC is not dependent on the provision of water from the Lymington River. Due to the distance between the option and the SAC (3.1km), no other impact pathways are present during construction and no significant effects are anticipated.

No impact pathways have been identified during operation.

It is considered that no likely significant effects are anticipated on the Solent and Isle of Wight Lagoons SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore

not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

4.2 Stage 2 Appropriate Assessment

4.2.1 Scope

The following six sites were assessed at Stage 2 AA:

- Solent and Southampton Water SPA (approximately 30m east)
- Solent and Southampton Water Ramsar (approximately 30m east)
- The New Forest SAC (approximately 1.6km north-east)
- New Forest SPA (approximately 1.8km north-east)
- New Forest Ramsar (approximately 1.8km north-east)
- Solent Maritime SAC (approximately 2km south-east)
- Solent and Dorset Coast SPA (approximately 4km south-east)

An assessment of each potential impact on the integrity of the designated sites is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 4.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

4.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

These measures are defined as industry-wide best practice measures to address common risks in the construction and development sectors and thus are proven to reduce the risk of the identified effects in so far as is reasonably possible.

All construction activities associated with the new borehole will be within the existing Ampress WTW footprint. Therefore, no additional habitat loss or fragmentation is anticipated as a result of the option.

The assumption, in the absence of detailed design or recent survey data, is that significant proportions of the overall Solent and Southampton Water SPA and Ramsar populations of teal, dark-bellied brent goose, ringed plover and black-tailed godwit use habitats within the Lymington River Reedbeds SSSI and Lymington River SSSI for foraging and/or roosting over winter, and are therefore at risk of disturbance during construction. Similarly, these SSSIs are functionally linked habitat for hen harrier and hobby associated with the New Forest SPA; significant proportions of these species' populations are assumed to use habitats within these SSSIs for foraging over winter and breeding periods respectively.

As detailed above, it is assumed that the target aquifer for abstraction is deep confined and there is no connection with the upper groundwater catchment or surrounding surface watercourses. This means there are no operational effects on any Habitats Sites within the ZoI.

It is assumed at this stage that any dewatering activities can be discharged to the Lymington River in order to compensate for any base flow lost from the groundwater (SW Hants Barton Group) source. This will therefore not be detailed in Table 4.2 below. An exact location for any discharge is currently unknown but assumes that there will be no change in water quality downstream of this location.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option BNW1 and the 'SW Hants Barton Group', that there would be no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. The WFD assessment concluded the confidence in the screening outcome is low, and therefore a precautionary approach is taken for this assessment; additional studies are required before a conclusion into the potential adverse effects during construction is possible. Any water transfer from the SW Hants Barton Group must be incorporated into the River Basin Management Plan (RBMP) and the implications of future design changes on the conservation objectives of the Habitats Sites within the option's ZoI should be assessed in accordance with the 2017 Regulations.

Table 4.2: Potential adverse effects on integrity of Habitats Sites from option BNW1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
Solent and Southampton Water SPA (approximately 30m east)	Breeding species: Mediterranean gull Little tern Common tern Sandwich tern Roseate tern	This option may have the following temporary or permanent effects on the qualifying features during the construction phase: ● Water table availability – a reduction in flow and water level within the Lymington River upstream of the SPA, due to the changes in groundwater level upstream. This may affect the surface water within the SPA downstream (Lymington Estuary). ● Toxic contamination – reduced dilution in the reaches of the SPA which are downstream from the borehole location, which may result in the degradation of habitats which support breeding bird species. ● Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of qualifying habitats. Nutrient enrichment within qualifying habitats, and habitats which support breeding bird species, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant temporary localised habitat degradation or loss leading to a reduction in the extent and/or distribution of habitats which support breeding bird species, from the impact pathways above. ● Biological disturbance – changes to habitat and prey availability from the above impact pathways, leading to the displacement of breeding bird species within the SPA boundary and/or from functionally linked habitats. This may jeopardise future breeding success, adult survival and population viability.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites), ● Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. The development of a Construction and Environmental Management Plan (CEMP) will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features.	The dewatering and discharge activities from the SW Hants Barton Group groundwater body will be constrained by the updated South West RDB RBMP, ensuring a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during construction.	
	Overwintering species: Teal Dark-bellied brent goose Ringed plover Black-tailed godwit Waterbird assemblage	In addition to the impact pathways detailed above, the following temporary or permanent effects may also affect overwintering populations: ● Non-physical disturbance – increased energy expenditure by qualifying features in response to construction related noise and visual disturbance, possibly resulting in displacement from preferred foraging or roosting areas and ultimately a reduction in winter survival rates. ● Biological disturbance – disturbance to qualifying features and reductions in the extent of habitats which support qualifying species, both of which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features.	In addition to the above, the following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● Sensitive timing of construction works to avoid the overwintering period (October to March inclusive). ● Due to the sensitivity of these species, it is recommended that works are undertaken outside of the sensitive period. However, if works will take place within these periods, works will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population, and will be supervised by an ornithological watching brief. ● Visual screening barriers should be erected around construction activities and plant movement routes, where works are taking place in or adjacent to habitats which may be considered functionally linked to the Habitats Site, or there is visual line of sight between construction activities and these habitats. ● Additional working methods which will reduce disturbance to overwintering birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			– Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark greens, grey or black will blend in to the background when moving. – All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical 'beeps'.	
Solent Maritime SAC (approximately 2km south-east)	Cord-grass swards Coastal saltmarsh Intertidal mudflats Glasswort and other annuals colonising mud and sand Desmoulin's whorl snail	This option may have the following temporary or permanent effects on the qualifying features during the construction phase: ● Water table availability – a reduction in flow and water level within the Lymington River upstream of the SAC, due to the changes in groundwater level upstream. This may affect the surface water within the SAC downstream (Lymington Estuary). ● Toxic contamination – reduced dilution in the reaches of the SAC which are downstream from the borehole location, which may result in the degradation of qualifying habitats and habitats which support Desmoulin's whorl snail. ● Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of qualifying habitats. Nutrient enrichment within qualifying habitats, and	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites), ● Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		habitats which support Desmoulin's whorl snail, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant temporary localised habitat degradation or loss leading to a reduction in the extent and/or distribution of qualifying habitats or habitats which support Desmoulin's whorl snail, from the impact pathways above. ● Biological disturbance – changes to habitat availability from the above impact pathways, leading to the displacement of Desmoulin's whorl snail within the SAC boundary and/or from functionally linked habitats. This may jeopardise future breeding success, adult survival and population viability. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features.	– Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. The dewatering and discharge activities from the SW Hants Barton Group groundwater body will be constrained by the updated South West RDB RBMP, ensuring a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during construction.	
	Estuaries Subtidal sandbanks Coastal lagoons Annual vegetation of drift lines Coastal shingle vegetation Shifting dunes with marram	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.
Solent and Southampton Water Ramsar	Shallow coastal waters	See "Possible adverse effects before mitigation" listed above for cord-grass swards, coastal saltmarsh, intertidal mudflats, glasswort and other	See "Indicative mitigation measures" listed above for cord-grass swards, coastal saltmarsh, intertidal mudflats, glasswort and other annuals colonising	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
(approximately 30m east)	Coastal saltmarsh Reedbeds Grazing marsh Intertidal mudflats RDB invertebrates RDB plants	annuals colonising mud and sand, and Desmoulin's whorl snail for the Solent Maritime SAC.	mud and sand, and Desmoulin's whorl snail for the Solent Maritime SAC.	
	Black-tailed godwit Dark-bellied brent goose Teal Waterfowl assemblage (overwintering)	See "Possible adverse effects before mitigation" listed above for the overwintering qualifying features of the Solent and Southampton Water SPA.	See "Indicative mitigation measures" listed above for for the overwintering qualifying features of the Solent and Southampton Water SPA.	No adverse effects.
	Estuaries Reefs Coastal lagoons Coastal woodlands	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.
The New Forest SAC (approximately 1.6km north-east)	Dry heaths Purple moor-grass meadows Depressions on peat substrates	This option may have the following temporary or permanent effects on the qualifying features during the construction phase: ● Water table availability – a reduction in water level within the SW Hants Barton Group groundwater body, due to dewatering activities during construction. This may affect the qualifying habitats present within the SAC boundary.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites),	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		• Toxic contamination – reduced dilution in the reaches of the SAC which are hydrologically connected to the borehole location, which may result in the degradation of qualifying habitats. • Physical loss and/or damage – significant temporary localised habitat degradation or loss leading to a reduction in the extent and/or distribution of qualifying habitats, from the impact pathways above. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution and extent of qualifying features.	The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. The dewatering and discharge activities from the SW Hants Barton Group groundwater body will be constrained by the updated South West RDB RBMP, ensuring a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during construction.	
	Nutrient-poor shallow waters with aquatic vegetation on sandy plains Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels Northern Atlantic wet heaths Beech forests on acid soils Beech forests on neutral to rich soils Dry oak-dominated woodland Bog woodland Alder woodland on floodplains	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
	Transition mires and quaking bogs Alkaline fens Southern damselfly Stag beetle Great crested newt			
New Forest SPA (approximately 1.8km north-east)	Nightjar Woodlark Honey buzzard Dartford warbler	This option may have the following temporary or permanent effects on the qualifying features during the construction phase: ● Water table availability – a reduction in water level within the SW Hants Barton Group groundwater body, due to dewatering activities during construction. This may affect the supporting habitats present within the SPA boundary and in functionally linked habitats outside of the SPA. ● Toxic contamination – reduced dilution in the groundwater waterbody which is hydrologically connected to the borehole location, which may result in the degradation of supporting habitats both within and outside of the SPA boundary. ● Biological disturbance – changes to habitat availability from the above impact pathways, leading to the displacement of qualifying features within the SPA boundary and/or from functionally linked habitats. This may jeopardise future breeding success, adult survival and population viability. Physical loss and/or damage – significant temporary localised habitat degradation or loss leading to a reduction in the extent and/or distribution of qualifying habitats, from the impact pathways above.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites), The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. The dewatering and discharge activities from the SW Hants Barton Group groundwater body will be constrained by the updated South West RDB RBMP, ensuring a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during construction.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
	Hobby (breeding) Hen harrier (overwintering)	In addition to the impact pathways detailed above, the following temporary or permanent effects may also affect breeding hobby and overwintering hen harrier: ● Water table availability – a reduction in flow and water level within the Lymington River, due to the changes in groundwater level upstream. This may affect the surface water within functionally linked habitats, degrading them and displacing available prey for these qualifying features. ● Toxic contamination – reduced dilution in the Lymington Stream, which may result in the degradation of functionally linked habitats. ● Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of qualifying habitats. Nutrient enrichment within functionally linked habitats, caused by reductions in flow and water levels. ● Non-physical disturbance – increased energy expenditure by qualifying features in response to construction related noise and visual disturbance, possibly resulting in displacement from preferred foraging or roosting areas and ultimately a reduction in winter survival rates. ● Biological disturbance – disturbance to qualifying features and reductions in the extent of habitats which support qualifying species, both of which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features	In addition to the above, the following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Sensitive timing of construction works to avoid the breeding period for hobby (May to August inclusive) and the overwintering period for hen harrier (October to March inclusive). ● Due to the sensitivity of these species, it is recommended that works are undertaken outside of the sensitive period. However, if works will take place within these periods, works will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population, and will be supervised by an ornithological watching brief. ● Visual screening barriers should be erected around construction activities and plant movement routes, where works are taking	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			place in or adjacent to habitats which may be considered functionally linked to the Habitats Site, or there is visual line of sight between construction activities and these habitats. ● Additional working methods which will reduce disturbance to overwintering birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise. – Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark greens, grey or black will blend in to the background when moving. – All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. – All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical 'beeps'.	
Solent and Dorset Coast SPA (approximately 4km south-east)	All	This option may have the following temporary or permanent effects on the qualifying features during the construction phase: ● Water table availability – a reduction in flow and water level within the Lymington River upstream of the SPA, due to the changes in groundwater level upstream. This may affect the surface water which affects the SPA downstream.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6:	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		• Toxic contamination – reduced dilution in the reaches of the SPA which are downstream from the borehole location, which may result in the degradation of habitats which support the qualifying features. • Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of qualifying habitats. Nutrient enrichment within supporting habitats, caused by reductions in flow and water levels. • Biological disturbance – changes to prey availability from the above impact pathways, leading to the displacement of prey items within or from functionally linked habitats and subsequently otter, where food availability is reduced. This may jeopardise future breeding success, adult survival and population viability. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features.	Pollution prevention guidance for working at construction and demolition sites), • Specific mitigation to reduce increased sedimentation and silt deposition downstream include: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. The dewatering and discharge activities from the SW Hants Barton Group groundwater body will be constrained by the updated South West RDB RBMP, ensuring a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during construction.	

Source: Mott MacDonald Limited, 2023

4.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on any of the Habitats Sites during the construction phase, provided the recommended mitigation measures are implemented at the project level. Mitigation which may be progressed at the project stage could include pre-construction surveys, timing restrictions of works, toolbox talks, and the presence of an Ecological Clerk of Works (ECoW).

No significant effects were identified during operation, provided the assumptions surrounding the depth of the aquifer, and it having no interaction with the groundwater or surface water, as detailed within the WFD level 2 assessment, are correct.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydrogeological studies and hydrodynamic modelling of groundwater levels and flows to identify whether the changes in the water levels from the construction of the new borehole, and the discharge to the Lymington River, would have an adverse effect on the base flow within the Lymington River, and subsequently the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites and their qualifying features downstream of this location (Solent and Southampton Water SPA, Solent and Southampton Water Ramsar, Solent Maritime SAC and Solent and Dorset Coast SPA). Additional studies focusing on the temporary reductions in groundwater during construction will also identify whether there may be temporary adverse effects on any other groundwater-dependent Habitats Sites within the ‘SW Hants Barton Group’ groundwater catchment (The New Forest SAC and New Forest SPA).
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential temporary adverse effects of dewatering and discharge during construction.
- A detailed review of the baseline ecological data, including overwintering bird populations and hobby distribution, is also recommended to determine data gaps and additional surveys required to inform more targeted mitigation measures during construction.
- Desk based noise assessment to determine extent of the ZoI once more information is available on construction methodology.
- Evaluation and modelling of emissions from traffic (heavy goods vehicles), plant and non-road mobile machinery to determine if heavy goods vehicle restrictions are required during construction works within close proximity to the Solent and Southampton Water SPA and Ramsar, and functionally linked habitats associated with the New Forest SPA.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

A Construction Environmental Management Plan will be put in place, including the proposed mitigation measures in this document as well as any additional measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

5 BNW6 Longham Aquifer Recharge

5.1 Stage 1 Screening

The Stage 1 Screening identified nine Habitats Sites within the ZoI of BNW6 (Table 5.1). LSE could not be ruled out for four of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B.

Table 5.1: BNW6 Stage 1 Screening results

Potential for significant effects	No likely significant effects
Dorset Heaths SAC (approximately 1.4km south-east)	Solent and Dorset Coast SPA (7.2km south)
Dorset Heathlands SPA (approximately 2km north)	River Avon SAC (approximately 8.3km east / 17.5km downstream)
Dorset Heathlands Ramsar (approximately 1.4km south-east)	Avon Valley Ramsar (approximately 7.8km east / 18km downstream)
Avon Valley SPA (approximately 7.8km east / 18km downstream)	Poole Harbour SPA (approximately 7.2km south-west)
	Poole Harbour Ramsar (approximately 7.2km south-west)

Source: Mott MacDonald Limited, 2023

5.1.1 Dorset Heaths SAC

This site is hydrologically connected to the option via the WFD groundwater waterbody GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon). This site is identified as a GWDTE and therefore is particularly ecologically sensitive to changes in groundwater levels and/or chemistry.

The closest component of the SAC to the option is the Turbary and Kinson Commons SSSI, which is on the south side of the River Stour and therefore not directly hydrologically connected to the option. However, the interaction between the groundwater catchment and the River Stour is not currently known, and so groundwater pollution is considered to still have significant effects on this SSSI component, in the absence of evidence to the contrary. All components of the SAC which are hydrologically connected to the option via the WFD groundwater waterbody GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon), and within 5km, are considered to be subject to significant effects from groundwater pollution during construction, as a worst-case scenario.

Any pollution events during construction may result in permanent damage and degradation of qualifying Annex I habitats. This option therefore has the potential to reduce the overall extent and distribution of qualifying habitats. Likely significant effects are only anticipated on the following qualifying Annex I habitats: European dry heaths, wet heathland with cross-leaved heath, depressions on peat substrates, and dry oak-dominated woodland.

No significant effects are anticipated on the following qualifying features during operation, given that they are not present within components of the SAC which are hydrologically connected to, and within 5km of, this option: purple moor-grass meadows, calcium-rich fen dominated by great fen sedge, calcium-rich springwater-fed fens, Southern damselfly *Coenagrion mercuriale* and great crested newt *Triturus cristatus*.

There are no other impact pathways due to the distance between the site (1.2km) and the option during the construction (drilling) of additional boreholes.

Water is to be discharged into new boreholes during the winter, for subsequent abstraction in the summer. The source of the storage water is the Matchams Intake on the River Stour. There will be no changes in groundwater levels, for which some qualifying features are dependent, and therefore no significant effects are anticipated during operation.

Likely significant effects cannot be ruled out on the Dorset Heaths SAC during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

5.1.2 Dorset Heathlands SPA

The hydrological connection between this site and the option is the same as described above for the Dorset Heaths SAC. This site is identified as a GWDTE and therefore is particularly ecologically sensitive to changes in groundwater levels and/or chemistry. No construction activities are anticipated in association with the licence transfer to Longham WTW.

The closest component of the SPA to the option is the Canford Heath SSSI, which is on the south side of the River Stour and therefore not directly hydrologically connected to the option. However, the interaction between the groundwater catchment and the River Stour is not currently known, and so any groundwater pollution is considered to still have significant effects on this SSSI component, in the absence of evidence to the contrary. All components of the SPA which are hydrologically connected to the option via the WFD groundwater waterbody GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon), and within 5km, are considered to be subject to significant effects from groundwater pollution, as a worst-case scenario.

Pollution of the groundwater during construction may result in permanent damage and degradation of habitats which support qualifying features, particularly European dry heaths and wet heathland with cross-leaved heath. This can result in the displacement of qualifying features from optimal and preferred breeding, roosting and foraging grounds, and the movement within or from the SPA. This option therefore has the potential to reduce the overall extent, distribution and populations sizes of qualifying species within the SPA. Water quality and quantity has not been identified as a limiting attribute for any of the qualifying features, as stated within the conservation objectives supplementary advice[20], although it has been considered within this assessment as a precautionary approach.

Although only Dartford warbler *Sylvia undata* has been identified as a monitored feature within the SSSI components of the SPA anticipated to be significantly affected, the habitats present constitute suitable habitat within the SPA boundary for all of the other qualifying features, and therefore significant effects on all cannot be ruled out.

The construction is within an existing SWW site, over 1km from the SPA and outside of suitable functionally linked habitat. Therefore, it is not anticipated that there will be significant construction disturbance to qualifying features or damage to any of their supporting habitats outside of the SPA boundary.

[20] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Dorset Heathlands Special Protection Area (SPA) Site Code: UK9010101. Available at: European Site Conservation Objectives for Dorset Heathlands SPA - UK9010101 (naturalengland.org.uk)

There are no anticipated effects during operation, as none of the qualifying features of the site are dependent on surface water levels, which may be affected during operation as a result of increased abstraction.

Likely significant effects cannot be ruled out on the Dorset Heathlands SPA during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

5.1.3 Dorset Heathlands Ramsar

This hydrological connection between this site and the option is the same as described above for the Dorset Heaths SAC. This site is identified as a GWDTE and therefore is particularly ecologically sensitive to changes in groundwater levels and/or chemistry. The details of groundwater pollution pathways are provided within Section 7.1.1 (Dorset Heaths SAC) above.

The pollution of groundwater during construction may result in permanent damage and degradation of qualifying Annex I habitats, primarily wet heathland with cross-leaved heath (Ramsar criteria 1 and 3), and habitats which support notable wetland plants and invertebrates (Ramsar criterion 2). This option therefore has the potential to reduce the overall extent and distribution of qualifying habitats, and the extent, distribution and populations sizes of qualifying species.

There are no other impact pathways due to the distance between the site (1.4km) and the option during the construction (drilling) of additional boreholes.

Water is to be discharged into new boreholes during the winter, for subsequent abstraction in the summer. The source of the storage water is the Matchams Intake on the River Stour. There will be no changes in groundwater levels, for which some qualifying features are dependent, and therefore no significant effects are anticipated during operation.

Likely significant effects cannot be ruled out on the Dorset Heathlands Ramsar during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

5.1.4 Solent and Dorset Coast SPA

There is a hydrological connection between the site and the option via the WFD groundwater waterbody GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon) and the River Stour. Any pollution events, if they were to occur during construction, are not anticipated to result in significant effects within the SPA boundary, due to the distance downstream (approximately 14km). There are no other impact pathways during construction due to the distance of the site (14km downstream) from the option. The habitats surrounding the option at Longham Lakes are not considered to be functionally linked habitats used by the qualifying features of this SPA.

Water is to be discharged into new boreholes during the winter, for subsequent abstraction in the summer. The source of the storage water is the Matchams Intake on the River Stour. There will be no changes in groundwater levels, for which some qualifying features are dependent, and therefore no significant effects are anticipated during operation.

It is considered that no likely significant effects are anticipated on the Solent and Dorset SPA. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SPA or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

5.1.5 River Avon SAC

There is a hydrological connection between the site and the option via the WFD groundwater waterbody GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon) and the River Stour. Any pollution events, if they were to occur during construction, are not anticipated to result in significant effects within the SPA boundary, due to the distance downstream (approximately 17.5km). There are no other impact pathways due to the distance between the SAC and this option during the construction (drilling) of additional boreholes.

Water is to be discharged into new boreholes during the winter, for subsequent abstraction in the summer. The source of the storage water is the Matchams Intake on the River Stour. There will be no changes in groundwater levels, for which some qualifying features are dependent, and therefore no significant effects are anticipated during operation.

It is considered that no likely significant effects are anticipated on the River Avon SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

5.1.6 Avon Valley SPA

There is a hydrological connection between the site and the option via the WFD groundwater waterbody GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon) and the River Stour. Any pollution events during construction are not considered to result in significant effects at this distance (7.8km east and 18km downstream).

Construction activities have the potential to result in permanent and temporary habitat loss of functionally linked land used by qualifying species of the Avon Valley SPA. Although the indicative construction area for option BNW6 is approximately 7.8km from the Habitats Sites (and 18km upstream), it is within Natural England's *Goose and Swan Functional Land IRZ*, which has identified suitable habitat outside of the sites' boundaries which can support qualifying species. At this distance from the SPA boundary, it is likely that the only qualifying species present will be Bewick's swan. Swans will typically forage in agricultural land during the day and return to roosting sites within the Avon Valley SPA at night. Direct habitat loss and damage of functionally linked habitats with the IRZ is not anticipated, as the construction will be within the existing Longham WTW. However, groundwater pollution from construction activities could affect the ability of the surrounding functionally linked land to support the Habitats Site's population. The ability of these qualifying species to safely and successfully move to and from nesting, feeding and roosting areas is critical to adult fitness and survival, and future breeding success.

During construction there may also be indirect effects to the integrity of the Avon Valley SPA through disturbance; noise, visual disturbance and artificial light are all sources of disturbance which could impact upon qualifying features. Disturbance can result in changes to feeding or roosting behaviours, increased energy expenditure due to more frequent flights, abandonment of nests, disrupted incubation of eggs and desertion of supporting habitat. Disturbance to qualifying species when foraging may jeopardise adult fitness, survival and breeding success by displacing birds from preferred feeding grounds. Effects of displacement may be temporary or long-lasting and may result in redistribution within or from a site.

Since this IRZ area is considered to be potentially functionally linked to the Habitats Sites, the construction of option BNW6 may have a significant effect on the qualifying species of Avon Valley SPA, resulting in changes to overall distribution and population sizes. Without up-to-date species records or survey data, it is not possible to rule out significant effects on these Habitats Sites during the screening stage.

No significant effects are anticipated on gadwall *Anas strepera* during construction, as this species is unlikely to use the habitats surrounding the option due to the distance from the SPA boundary (approximately 7.8km).

There are no other impact pathways due to the distance between the site and the option (18km downstream) during the construction (drilling) of additional boreholes.

Water is to be discharged into new boreholes during the winter, for subsequent abstraction in the summer. The source of the storage water is the Matchams Intake on the River Stour. There will be no changes in groundwater levels, for which some qualifying features are dependent, and therefore no significant effects are anticipated during operation.

Likely significant effects cannot be ruled out on the Avon Valley SPA during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

5.1.7 Avon Valley Ramsar

This hydrological connection between this site and the option is the same as described above for the Avon Valley SPA. This site is identified as a GWDTE and therefore is particularly ecologically sensitive to changes in groundwater levels and/or chemistry. Any pollution events, if they were to occur during construction, are not considered to result in significant effects at this this distance (7.8km east and 18km downstream). There are no other impact pathways due to the distance between the site and the option during the construction (drilling) of additional boreholes.

Water is to be discharged into new boreholes during the winter, for subsequent abstraction in the summer. The source of the storage water is the Matchams Intake on the River Stour. There will be no changes in groundwater levels, for which some qualifying features are dependent, and therefore no significant effects are anticipated during operation.

It is considered that no likely significant effects are anticipated on the Avon Valley Ramsar. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Ramsar or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

5.1.8 Poole Harbour SPA

There is no hydrological connectivity between this site and the option, and therefore changes in groundwater abstraction are not anticipated to have any effect on the SPA. The habitats surrounding the option are not considered to be suitable for the qualifying features and therefore are not functionally linked. As such, there are no impact pathways during operation.

It is considered that no likely significant effects are anticipated on the Poole Harbour SPA. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SPA or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

5.1.9 Poole Harbour Ramsar

There is no hydrological connectivity between this site and the option, and therefore changes in groundwater abstraction are not anticipated to have any effect on the Ramsar. The habitats surrounding the option are not considered to be suitable for the qualifying features and therefore are not functionally linked. As such, there are no impact pathways during operation.

It is considered that no likely significant effects are anticipated on the Poole Harbour SPA. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Ramsar or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

5.2 Appropriate Assessment

5.2.1 Scope

The following three sites were assessed at Stage 2 Appropriate Assessment:

- Dorset Heaths SAC (approximately 1.4km south-east)
- Dorset Heathlands SPA (approximately 2km north)
- Dorset Heathlands Ramsar (approximately 1.4km south-east)
- Avon Valley SPA (approximately 7.8km east / 18km downstream)

An assessment of each potential impact on the integrity of the designated sites is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 5.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

5.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

These measures are defined as industry-wide best practice measures to address common risks in the construction and development sectors and thus are proven to reduce the risk of the identified effects in so far as is reasonably possible.

It is assumed that the Longham Lakes provide suitable functionally linked land for significant numbers of Bewick's swan associated with the Avon Valley SPA, as this area is within a Goose and swan functional land IRZ. Whilst any pollution of the groundwater during construction is not anticipated to affect the lake themselves, it may affect other functionally linked habitats within the IRZ.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option BNW6 and the 'Lower Dorset Stour and Lower Hampshire Avon', that there was not the potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. The WFD assessment concluded the confidence in the screening outcome is low, and therefore a precautionary approach is taken for this assessment.

Table 5.2: Potential adverse effects on integrity of Habitats Sites from option BNW6

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
Dorset Heaths SAC (approximately 1.4km south-east)	European dry heaths Wet heathland with cross-leaved heath Depressions on peat substrates Dry oak-dominated woodland	This may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary and damage qualifying Annex I habitats. ● Physical loss and/or damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying habitats, as a result of the above impact pathway. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. No impact pathways are identified during operation.	The following mitigation and best practice measures will be implemented to avoid or reduce adverse effects, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	No adverse effects.
	Purple moor-grass meadows Calcium-rich fen dominated by great fen sedge Calcium-rich springwater-fed fens Southern damselfly Great crested newt	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.
Dorset Heathlands SPA (approximately 2km north)	All	This option may have the following permanent effects on the qualifying features during operation:	The following mitigation and best practice measures will be implemented to avoid or reduce adverse effects, and should be progressed at the project stage:	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary and functionally linked habitats outside the SPA which support qualifying features. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in the extent and/or distribution of habitats which support qualifying features, from the impact pathway above. ● Biological disturbance - changes to habitat availability from the above impact pathways, leading to the displacement of qualifying features within or from the SPA and jeopardising adult survival, breeding success and future population viability of the qualifying features associated with the SPA. The effects of physical loss or damage of supporting habitats during operation could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features.	● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
Dorset Heathlands Ramsar (approximately 1.4km south-east)	All	This may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary and damage qualifying Annex I habitats and habitats which support wetland plant and invertebrates. ● Physical loss and/or damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying habitats, as a result of the above impact pathway. ● Biological disturbance - changes to habitat availability from the above impact pathways, leading to the displacement of qualifying features within or from the	The following mitigation and best practice measures will be implemented to avoid or reduce adverse effects, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage.	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		Ramsar and jeopardising future population viability of the qualifying features associated with the Ramsar. The effects of physical loss or damage of qualifying habitats, and habitats which support qualifying features, during operation could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features. No impact pathways are identified during operation.	Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
Avon Valley SPA (approximately 7.8km east / 18km downstream)	Bewick's swan	Option BNW6 lies within the Avon Valley *Goose and Swan Functional Land IRZ*, with the following temporary impacts possible during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the IRZ boundary, resulting in degradation which reduces the extent and/or distribution of functionally linked habitat available for this species. ● Non-toxic contamination - habitat degradation caused by increased suspended sediment and turbidity from associated run-off during construction. This could lead to increased silt deposition and smothering of qualifying habitats. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in qualifying habitats, from the impact pathways above. ● Non-physical disturbance – displacement of qualifying species from noise, visual and/or artificial lighting pathways, associated with construction activities, increasing vehicular movement, personnel and lighting can impact survival and distribution of bird species; and ● Biological disturbance – changes in habitat availability and potential for SPA populations to be displaced from	The following measures will be implemented to avoid or reduce adverse impacts during construction, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. ● Specific mitigation to reduce increased sedimentation and silt deposition include: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport.	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		current foraging areas, resulting in a reduction in winter survival rates and population viability. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent impacts but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species. No impact pathways are present during operation.	• Sensitive timing of construction works to avoid the passage and overwintering period for birds detailed in the Avon Valley SPA supplementary advice note[21] during November to March inclusive. • Any works which are undertaken between November and March which may disturb or displace this species from suitable functional land will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population in the advice note (156 individuals, therefore 2 birds is the threshold). • If this sensitive period cannot be avoided, additional mitigation measures may be required, such as the implementation of visual screening barriers erected around construction activities and plant movement routes, where works are taking place in or adjacent to habitats which may be considered functionally linked to the Habitats Site, or there is visual line of sight between construction activities and these habitats. • Additional working methods which will reduce disturbance to overwintering birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise. – Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark greens, grey or black will blend in to the background when moving.	

[21] Natural England (2019). Avon Valley SPA (UK90111091) Conservation Objectives Supplementary Advice [online] available at: European Site Conservation Objectives for Avon Valley SPA - UK9011091 (naturalengland.org.uk)

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			– All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. – All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical 'beeps'. This approach is considered to be precautionary in the absence of recent survey data. Habitat loss and non-physical disturbance caused by construction are not anticipated to result in adverse effects on the integrity of the SPA from reductions in habitat availability and/or displacement effects. However, this cannot be confirmed until records or survey data is obtained. Therefore, these mitigation measures are proposed to remove the potential adverse effects. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
	Gadwall	There are no impact pathways identified for this qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.

Source: Mott MacDonald Limited, 2023

5.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on any of the Habitats Sites during the construction phase, provided the recommended mitigation measures are implemented at the project level, and further research identified in the conclusion of this Appropriate Assessment is undertaken, leading to a final project that will operate in compliance with the 2017 Regulations.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- A detailed review of the baseline ecological data, including overwintering bird populations, is also recommended to determine data gaps and additional surveys required to inform more targeted mitigation measures during construction.
- The adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

A Construction Environmental Management Plan will be put in place, including the proposed mitigation measures in this document as well as any additional measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

6 BNW7 Mendips Quarry – Raw water transfer and augmentation of the River Stour

6.1 Stage 1 Screening

For the purposes of environmental appraisal, the scheme was split out into seven elements, which are not detailed within this summary. A total of 24 Habitats Sites were identified within the ZoI of all scheme elements combined, and LSE could not be ruled out for 20 of these sites. Therefore, a total of 20 sites were progressed to the Stage 2 AA.

6.2 Stage 2 Appropriate Assessment outcomes and recommendations

6.2.1 Construction effects

The Stage 2 AA concluded that following the mitigation measures recommended, no adverse effects on site integrity were expected during construction, on all but two of the Habitats Sites; the Dorset Heaths (Purbeck & Wareham) and Studland SAC, and Dorset Heathlands SPA. Residual effects from physical loss and/or damage, and non-physical disturbance means that further studies are recommended to ensure the relevant information is secured to support the project level HRA, prior to the submission of a planning application. This is likely to include protected species and habitat surveys to ascertain how adverse effects can be practically avoided or mitigated.

6.2.2 Operation effects

The Stage 2 AA concluded that during operation, the scheme has the potential to affect the integrity of the following Habitats Sites: Seven Estuary SAC/SPA/Ramsar, Mendip Woodlands SAC, and Solent and Dorset Coast SPA. The following pathways may lead to changes which compromise the conservation objectives:

- Changes to water levels and flows due to direct intake from the River Avon and outfall into the River Stour.
- Non-toxic contamination resulting from changes in water turbidity, sediment loading and silt deposition.
- Physical damage as a result of water quality changes, from changes in flow and sediment deposition.
- Toxic contamination leading to biomass reductions and food web disruptions; transportation of pollutants into estuarine environments where bioaccumulation may affect qualifying features.
- Biological disturbances such as changes in habitat availability, including functionally linked habitat used by qualifying features. This may ultimately lead to displacement of qualifying features from preferred foraging areas. The potential for spread of INNS as a result of water discharge into the River Stour.

6.2.3 In-combination assessment

A preliminary in-combination assessment was carried out which identified two other plans and developments which could result in in-combination effects together with the proposed SRO. Considering the limited information available at the time of assessment for these plans and

developments, a potential for in-combination adverse effects has been assumed on a precautionary basis.

6.2.4 Outcomes and recommendations

It is the opinion of this HRA report that no adverse effects on site integrity can be concluded on any of the Habitats Sites during the construction phase, provided the principles outlined in the 'Next Steps' section below (Section 27), the recommended mitigation measures within the SRO HRA, and further studies stated above, are implemented at the project level.

It is the opinion of this HRA that no adverse effect on site integrity can be concluded for this SRO option during operation, on the understanding that further research identified in the conclusion of the SRO Appropriate Assessment, and within the SRO WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

As a result, the scheme would have no appreciable effect on the integrity of any Habitat Sites within the ZoI and therefore would not contribute to any in-combination effects, resulting in an updated conclusion to the SRO HRA.

Further studies recommended within the SRO HRA to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, include but are not limited to:

- Hydro-ecology studies and hydrodynamic modelling of flows to identify whether the changes in the water levels from the new abstraction and outfalls would have an adverse effect on the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites within the ZoI, and their qualifying features.
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential adverse effects on the Habitats Sites within the ZoI. Future modelling will need to be refined once further information is available.
- A detailed review of the baseline ecological data is also recommended to determine data gaps and additional surveys required to inform more targeted mitigation measures during construction and operation.
- Groundwater monitoring is required to understand groundwater levels and how they interact with the proposed new reservoir and pipeline infrastructure.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

A Construction Environmental Management Plan will be put in place, including the proposed mitigation measures in the SRO HRA as well as any additional measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in the SRO HRA are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

7 BNW8 Poole Harbour FE-reuse

7.1 Stage 1 screening

A total of 14 Habitats Sites were screened in based on their proximity (10km radius) and hydrological connectivity to the proposed PERT scheme. LSE were identified on eight Habitats Sites during construction works, including Dorset Heathlands SPA and Ramsar, Dorset Heaths SAC, Avon Valley SPA and Ramsar, River Avon SAC, and Poole Harbour SPA and Ramsar.

LSE were also identified for 10 Habitats Sites during operation of the PERT scheme. This included River Avon SAC, Poole Harbour SPA and Ramsar, Avon Valley SPA and Ramsar, Solent and Dorset Coast SPA, Solent Maritime SAC, Solent and Southampton Water SPA and Ramsar, and South Wight Maritime SAC.

7.2 Stage 2 Appropriate Assessment outcomes and recommendations

7.2.1 Construction effects

The Stage 2 AA concluded that following the mitigation measures recommended to limit effects of air and dust emissions, and anthropogenic disturbance on qualifying habitats and species, no adverse effects on site integrity were expected during construction.

7.2.2 Operation effects

The Stage 2 AA concluded that during operation, no adverse effects on Habitats Sites were identified based on currently available information. However, uncertainty remains regarding the scheme design and composition of treated effluent for discharge into the River Stour. Additionally, a range of gaps in design and bespoke assessment were identified. This is expected given that Gate 2 is to review scheme feasibility.

7.2.3 In-combination assessment

No in-combination effects with other plans and projects were identified with the PERT scheme based on publicly available information.

7.2.4 Outcomes and recommendations

Further monitoring is recommended within the SRO HRA for Gate 3 to support the HRA assessment of the scheme.

It is the opinion of this HRA that no adverse effect on site integrity can be concluded for this SRO option during operation, on the understanding that further research identified in the conclusion of the SRO Appropriate Assessment, and within the SRO WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

As a result, the scheme would have no appreciable effect on the integrity of any Habitat Sites within the ZoI and therefore would not contribute to any in-combination effects.

It should be noted that the conclusions contained in the SRO HRA are based on preliminary, indicative design assumptions available at this time and are primarily informed by available,

appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

8 BNW14 Ibsley Lake

8.1 Stage 1 Screening

The Stage 1 Screening identified 10 Habitats Sites within the ZoI of BNW14 (Table 8.1). LSE could not be ruled out for any of these sites.

Information on the qualifying features and conservation objectives of the Habitats Sites relevant assessed for this option is provided in Appendix B.

Table 8.1: BNW14 Stage 1 Screening results

Potential for significant effects	No likely significant effects
The New Forest SAC (approximately 800m east)	
New Forest SPA (approximately 800m east)	
New Forest Ramsar (approximately 800m east)	
Dorset Heaths SAC (approximately 300m west)	
Dorset Heathland SPA (approximately 300m west)	
Dorset Heathlands Ramsar (approximately 400m south-west)	
River Avon SAC (option is within the SAC boundary)	
Avon Valley SPA (option is within the SPA boundary)	
Avon Valley Ramsar (option is within the Ramsar boundary)	
Solent and Dorset Coast SPA (approximately 7.3km south-east and 13.5km downstream)	

Source: Mott MacDonald Limited, 2023

8.1.1 The New Forest SAC

There is hydrological connectivity between the site and the option upstream on Dockens Water and via the WFD groundwater waterbody ID GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon). This site has been identified as a GWDTE, which means it is ecologically sensitive to changes in groundwater levels and chemistry. Any pollution events during construction are unlikely to be transferred within the surface water connection but may be transferred via the groundwater catchment to the site and impact qualifying Annex I habitats, through localised damage or degradation. This may also result in degradation of habitats which support qualifying species such as great crested newt. No other impact pathways are present during construction.

During operation, increased abstraction of the groundwater from Ibsley Lakes may have an effect on the SAC due to changes in the water table. Additional assessment is required to determine how this may change the water table within the site; disturbance to water levels could result in degradation of Annex I habitats and further changes to habitats which support qualifying species, subsequently resulting in displacement within or from the SAC.

Likely significant effects cannot be ruled out on The New Forest SAC during the construction and operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.1.2 New Forest SPA

There is hydrological connectivity between the site and the option upstream on Dockens Water and via the WFD groundwater waterbody ID GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon). This site has been identified as a GWDTE, which means it is ecologically sensitive to changes in groundwater levels and chemistry. Any pollution events during construction are unlikely to be transferred with the surface water connection but may be transferred via the groundwater catchment to the site and may result in degradation of habitats which support qualifying species.

Although the option is not within the SPA boundary, there may be temporary losses to supporting habitat for some of the qualifying features. Both hen harrier and hobby are species which may use the wetland habitats surrounding the option for foraging, although the option is not anticipated to result in significant losses of these habitats. Additionally, foraging individuals may be disturbed by construction activities, which could affect foraging efforts, subsequently resulting in adverse effects on adult survival and breeding success.

However, information provided through the supplemetary conservation advice for this site states that the hen harrier population primarily feeds on small passerine birds associated with the heathland and adjacent farmland habitats within the SPA boundary. As such, foraging within habitats adjacent to the option is unlikely to constitute a significant part of the diet and any disturbance caused by construction activities is not anticipated to have a significant effect. Contrastingly, breeding hobbies may be more dependent on wetland habitats, with dragonflies, moths and beetles main prey items; disturbance from construction could adversely affect breeding success and/or fledgling survival through displacement from optimal foraging areas.

The other qualifying features of the site are not associated with wetland habitats for foraging or roosting, and so there is not anticipated to be significant effects from temporary loss of supporting habitat, nor construction disturbance due to the distance from the SPA boundary (800m). There are no other impact pathways during construction.

During operation, increased abstraction of the groundwater from Ibsley Lakes may have an effect on the SPA due to changes in the water table. Additional assessment is required to determine how this may change the water table within the site; disturbance to water levels could damage or degrade habitats which support qualifying species, subsequently resulting in displacement within or from the SPA.

Likely significant effects cannot be ruled out on the New Forest SPA during the construction and operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.1.3 New Forest Ramsar

There is hydrological connectivity between the site and the option upstream on Dockens Water and via the WFD groundwater waterbody ID GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon). This site has been identified as a GWDTE, which means it is ecologically sensitive to changes in groundwater levels and chemistry. Any pollution events during construction are unlikely to be transferred with the surface water connection but may be transferred via the groundwater catchment to the site and impact qualifying Annex I habitats, through localised damage or degradation. This may also result in degradation of habitats which support wetland plants and invertebrates. No other impact pathways are present during construction.

During operation, increased abstraction of the groundwater from Ibsley Lakes may have an effect on the Ramsar due to changes in the water table. Additional assessment is required to determine how this may change the water table within the site; disturbance to water levels could

result in degradation of Annex I habitats and further changes to habitats which support qualifying species, subsequently resulting in displacement within or from the Ramsar.

Likely significant effects cannot be ruled out on the New Forest Ramsar during the contruction or operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.1.4 Dorset Heaths SAC

There is hydrological connectivity between the site and the option via the WFD groundwater waterbody ID GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon). This site has been identified as a GWDTE, which means it is ecologically sensitive to changes in groundwater levels and chemistry.

The closest component of the SAC to the option is the St Leonards and St Ives Heaths SSSI, which is on the west side of the River Avon and therefore not directly hydrologically connected to the option. However, the interaction between the groundwater catchment and the River Avon is not currently known, and so groundwater pollution is considered to still have significant effects on SSSI components on the west of the river, in the absence of evidence to the contrary. All components of the SAC which are hydrologically connected to the option via the WFD groundwater waterbody GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon), and within 5km, are considered to be subject to significant effects from groundwater pollution during construction, as a worst-case scenario.

Any pollution events during construction may result in permanent damage and degradation of qualifying Annex I habitats. This option therefore has the potential to reduce the overall extent and distribution of qualifying habitats. Likely significant effects are only anticipated on the following qualifying Annex I habitats: European dry heaths, wet heathland with cross-leaved heath, purple moor-grass meadows, depressions on peat substrates, and dry oak-dominated woodland.

No significant effects are anticipated on the following qualifying features during operation, given that they are not present within components of the SAC which are hydrologically connected to, and within 5km of, this option: calcium-rich fen dominated by great fen sedge, calcium-rich springwater-fed fens, Southern damselfly and great crested newt.

There are no other impact pathways due to the distance between the site (800m) and the option during the construction of the pipeline infrastructure.

During operation, increased abstraction of the groundwater from Ibsley Lakes may have an effect on the SAC due to changes in the water table. Additional assessment is required to determine the effective area of abstraction and the interaction with this SAC; disturbance to water levels could result in degradation of Annex I habitats, subsequently resulting in changes to the extent and distribution within the SAC boundary.

Likely significant effects cannot be ruled out on the Dorset Heaths SAC during the construction or operation stages of the works. As such this designated site has been progressed to Stage 2 Appropriate Assessment.

8.1.5 Dorset Heathlands SPA

The hydrological connection between this site and the option is the same as described above for the Dorset Heaths SAC. This site is identified as a GWDTE and therefore is particularly ecologically sensitive to changes in groundwater levels and/or chemistry. The details of groundwater pollution pathways are provided within Section 8.1.4 (Dorset Heaths SAC) above. Any pollution events during construction may be transferred via the groundwater catchment to the site and degrade habitats which support qualifying species.

Although the option is not within the SPA boundary, there may be temporary losses to supporting habitat for some of the qualifying features. Both hen harrier and merlin are species which may use the wetland habitats surrounding the option for foraging, although the option is not anticipated to result in significant losses of these habitats.

During construction there may also be indirect effects to the integrity of the Dorset Heathlands SPA through disturbance; noise, visual disturbance and artificial light are all sources of disturbance which could impact upon qualifying features. Disturbance can result in changes to feeding or roosting behaviours, increased energy expenditure due to more frequent flights, abandonment of nests, disrupted incubation of eggs and desertion of supporting habitat. Disturbance to qualifying species when foraging may jeopardise adult fitness, survival and breeding success by displacing birds from preferred feeding grounds. Effects of displacement may be temporary or long-lasting and may result in redistribution within or from a site.

The closest component of the SPA to the option is the St Leonards and St Ives Heaths SSSI, approximately 300m west of the option. All qualifying features of the SPA are also monitored features of this SSSI. Woodland habitats adjacent to the SPA and River Avon are potentially functionally linked to the site and support breeding nightjar *Caprimulgus europaeus* and woodlark *Lullula arborea*. These breeding species, in addition to overwintering hen harrier and merlin, may be displaced from optimal habitats, resulting in changes to overall extent, distribution and population sizes associated with the SPA.

As Dartford warbler primarily use heathland habitats, it is not anticipated that they are at risk of disturbance from construction activities, despite their sensitivity. The heathland habitats closest to the option are typically buffered by areas of woodland, providing barriers to visual disturbance and dampening of noise and vibration which may be associated with construction of the pipeline infrastructure nearest the SPA.

During operation, increased abstraction of the groundwater from Ibsley Lakes may have an effect on the SPA due to changes in the water table. This may result in degradation or habitats which support both breeding and overwintering qualifying features, and functionally linked habitat within the River Avon floodplain which supports hen harrier and merlin over winter. Subsequent displacement from optimal breeding, roosting and foraging habitats may have long-term effects on the population viability of the SPA. Additional assessment is required to determine the effective area of abstraction and the interaction with this SPA.

Likely significant effects cannot be ruled out on the Dorset Heathlands SPA during the construction and operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.1.6 Dorset Heathlands Ramsar

This hydrological connection between this site and the option is the same as described above for the Dorset Heaths SAC. This site is identified as a GWDTE and therefore is particularly ecologically sensitive to changes in groundwater levels and/or chemistry. The details of groundwater pollution pathways are provided within Section 8.1.4 (Dorset Heaths SAC) above.

The pollution of groundwater during construction may result in permanent damage and degradation of qualifying Annex I habitats, primarily wet heathland with cross-leaved heath (Ramsar criteria 1 and 3), and habitats which support notable wetland plants and invertebrates (Ramsar criterion 2). This option therefore has the potential to reduce the overall extent and distribution of qualifying habitats, and the extent, distribution and populations sizes of qualifying species.

There are no other impact pathways due to the distance between the site (800m) and the option during the construction of the pipeline infrastructure.

During operation, increased abstraction of the groundwater from Ibsley Lakes may have an effect on the Ramsar due to changes in the water table. Additional assessment is required to determine the effective area of abstraction and the interaction with this Ramsar; disturbance to water levels could result in degradation of Annex I habitats and further changes to habitats which support wetland plant and invertebrate species, subsequently resulting in displacement within or from the Ramsar.

Likely significant effects cannot be ruled out on the Dorset Heathlands Ramsar during the construction and operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.1.7 Solent and Dorset Coast SPA

There is hydrological connectivity between the site and the option downstream on the River Avon (13.5km) and via the WFD groundwater waterbody ID GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon) (7.3km south). Part of this site (Christchurch Harbour SSSI) has been identified as a GWDTE, which means it is ecologically sensitive to changes in groundwater levels and chemistry. However, the distance is sufficient that any pollution events, if they did occur during construction, are not anticipated to be significant. Due to this distance there are no other impact pathways during construction; the qualifying bird species are marine and coastal specialists and will not travel this far inland to forage.

During operation, increased groundwater abstraction may result in a reduction in the water table level which could have a significant effect downstream within the SPA boundary. The interaction between the groundwater catchment and the River Avon is not currently known, and so groundwater abstractions could affect the base flow volume and velocity downstream of the option. This could subsequently lead to reduced water quality downstream within the SPA and have significant effects on the freshwater habitats which support its qualifying features.

Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for the colonisation of supporting habitats by pioneer species, such as excessive nutrient loading. This will subsequently result in reductions in habitat and prey availability for qualifying features, potentially displacing them from preferred foraging and roosting areas within the SPA. This may jeopardise adult survival and future breeding success, leading to changes in the extent, distribution and future viability of populations sizes associated with the SPA.

Water quality may also be reduced by the discharge of abstracted water directly into the River Avon immediately upstream of the existing intake at Matchams. The source water composition is currently unknown and may contain different chemical concentrations than the base River Avon. This may subsequently affect downstream water quality within the SPA boundary, reducing habitat suitability for preferred prey items and displacing them, and the qualifying features, to other areas of the site.

Likely significant effects cannot be ruled out on the Solent and Dorset Coast SPA during the construction and operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.1.8 River Avon SAC

The option bisects this site at four separate locations (on Dockens Water, Lin Brook and Bickerley Millstream) and directly interacts with the River Avon at the Matchams intake. Additionally, there is hydrological connectivity throughout the option via the WFD groundwater waterbody ID GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon). This site

has been identified as a GWDTE, which means it is ecologically sensitive to changes in groundwater levels and chemistry.

Due to this hydrological connectivity, it is possible that any pollution events (toxic or non-toxic) could be transferred within and throughout the SAC boundary and impact qualifying features. Qualifying Annex I habitats may be degraded through pollution, as could other habitats, flora and fauna for which qualifying features rely; these food resources and refuges may be lost and result in changes to the population sizes and distribution of qualifying features within or from the site. During construction of the pipeline and intake, there may be increases in suspended sediment which can result in dissolved oxygen sags and increased turbidity. This could have temporary impacts on the spatial distribution of sediments and topographic features within the river channel. The deposition of excess sediments could also smother benthic communities, reducing the habitat mosaic and creating anoxic conditions. The incidental release of pollutants during construction could increase contaminant levels in the water column and sediment, which over time could bioaccumulate into species present. Construction works may also facilitate the spread of invasive non-native species into the SAC.

This may result in degradation of suitable habitat and foraging areas for Desmoulin's whorl snail *Vertigo moulinsiana*, and migration routes for qualifying species, such as Atlantic salmon *Salmo salar,* sea lamprey *Petromyzon marinus*, brook lamprey *Lamptera planeri* and bullhead *Cottus gobio*, which could be displaced within or from the SAC as a result.

The River Avon already faces significant threats from water quality and is subject to a nutrient neutrality strategy. Additional pollution events during construction may exacerbate the nutrient levels within a site which is already in an 'unfavourable' condition.

Annex I habitats may be directly lost or damaged during construction, directly impacted at locations where proposed pipeline infrastructure crosses watercourses. They may also be indirectly impacted through increased turbidity or sedimentation as a result of construction activities adjacent to the watercourse. Increases in non-toxic pollution can indirectly impact qualifying species, for whom these are supporting habitats.

Due to the location of the option within the site, there may be temporary increases in air pollution from construction plant. This could result in degradation of qualifying habitats and other habitats which support qualifying species. Critical load data for rivers and streams was not available from APIS.

In addition to habitat loss, construction disturbance within the riparian zone may displace qualifying species from optimal habitats. Noise, visual and artificial light are all sources of disturbance which can result in changes to behaviours, increased energy expenditure due to fleeing and desertion of supporting habitat. Disturbance to qualifying fish species when foraging may jeopardise adult fitness, survival and breeding success. Effects of displacement may be temporary or long-lasting and may result in redistribution within or from a site.

During operation, increased abstraction of the groundwater from Ibsley Lakes may have an effect on the SAC due to changes in the water table and reduced flows in the River Avon. Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for pioneer species, such as excessive nutrient loading. This will subsequently result in reductions in habitat and prey availability for qualifying features, potentially displacing them from preferred foraging and roosting areas within the SAC. This may jeopardise adult survival and future spawning success of Desmoulin's whorl snail and migratory fish species, leading to changes in the extent, distribution and future viability of populations sizes associated with the SAC.

Water quality may also be reduced by the discharge of abstracted water directly into the River Avon immediately upstream of the existing intake at Matchams. The source water composition is currently unknown and may contain different chemical concentrations than the base River Avon. This SAC already faces significant threats from water quality which could be exacerbated by this discharge, preventing recovery from its currently 'unfavourable' condition to meet the conservation objectives.

Direct adverse effects on all qualifying fish species could occur due to entrainment and/ or impingement in the outfall, causing either injury or mortality. This also applies to any aquatic prey of the qualifying features, which could result in significant localised population changes, causing further displacement of qualifying features within the SAC.

Likely significant effects cannot be ruled out on the River Avon SAC during the construction and operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.1.9 Avon Valley SPA

The option lies within this site and is connected throughout by the River Avon system and the WFD groundwater waterbody ID GB40802G805800 (Lower Dorset Stour and Lower Hampshire Avon). This site has been identified as a GWDTE, which means it is ecologically sensitive to changes in groundwater levels and chemistry. Any pollution events may be transferred via the surface water and groundwater catchment to the site and degrade habitats which support qualifying species. Further details of pollution impact pathways are detailed within Section 8.1.8 (River Avon SAC) above.

Construction of the new pipeline has the potential to result in the loss of habitat used by the qualifying features within the SPA boundary. Construction may temporarily reduce this area used for foraging and roosting by qualifying features.

Due to the proximity of the option to the SPA, there is the potential for significant effects from increased exposure to air pollution (dust and nitrogen oxides associated with construction vehicles). Based on publicly available data from 2020 (2019 – 2021 three-year average)[22], nitrogen deposition at the site is 14.2kg/ ha/ year on short vegetation habitat with a critical load of 20 - 30kg/ ha/ year, although there is no critical load for the watercourse itself. Both nitrogen oxides and sulphur dioxide are below the critical level with nitrogen oxides at 12.3µg m^{-3} with a critical level of 30µg m^{-3} and sulphur dioxides at 1.1µg m^{-3} with a critical level of 10 – 20µg m^{-3}. Ammonia levels at the site are within the critical load range, although they do not exceed the maximum; current levels are 1.3µg m^{-3} with a critical load range of 1 - 3µg m^{-3}. Therefore, it is not anticipated that construction works will have a significant effect on air quality in relation to the Habitats Sites critical loads and levels.

Qualifying features may also be disturbed by visual and noise impacts of construction activities. Noise, visual and artificial light are all sources of disturbance which can result in changes to behaviours, increased energy expenditure due to fleeing and desertion of supporting habitat. Disturbance to qualifying species when foraging may jeopardise adult fitness, survival rates over the winter and future breeding success. Effects of displacement may be temporary or long-lasting and may result in redistribution within or from a site.

During operation, increased abstraction of the groundwater from Ibsley Lakes may have an effect on the SPA due to changes in the water table and reduced flows in the River Avon, as described in Section 8.1.8 (River Avon SAC) above. Additional assessment is required to determine how this may change the water table within the site; disturbance to water levels could

[22] Air Pollution Information System (2021). Site Relevant Critical Loads and Source Attribution (APIS GIS map tool). Accessed from: APIS app | Air Pollution Information System

result in degradation of habitats which support qualifying features, subsequently resulting in displacement within or from the SPA.

Likely significant effects cannot be ruled out on the Avon Valley SPA during the construction and operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.1.10 Avon Valley Ramsar

The hydrological connection between this site and the option is the same as described above for the Dorset Heaths SAC. This site is identified as a GWDTE and therefore is particularly ecologically sensitive to changes in groundwater levels and/or chemistry. The details of pollution pathways are provided within Section 8.1.8 (River Avon SAC) above. Any pollution events during construction may be transferred via the surface and groundwater catchments throughout the Ramsar and damage or degrade qualifying habitats (Ramsar criterion 1) and habitats which support qualifying species (Ramsar criteria 2 and 6).

Construction of the new pipeline has the potential to result in the loss of habitat used by the qualifying features within the Ramsar boundary, including nationally-rare wetland plants and invertebrates (Ramsar criterion 2) and overwintering bird species (Ramsar criterion 6). Construction may temporarily reduce the area used for foraging and roosting by qualifying bird species but result in direct mortality of invertebrates and plants.

Details on the potential for reductions in air quality, and potentially significant effects on overwintering bird species during construction, are the same as described in Section 8.1.9 (Avon Valley SPA) above.

The potentially significant effects on the Ramsar during operation are the same as detailed in Section 8.1.8 (River Avon SAC). Increased abstraction of the groundwater and discharge into the River Avon may result in reductions to flows, water quality and water table availability within the Avon Valley, leading to the degradation and/or loss of qualifying habitats and habitats which support qualifying features.

Likely significant effects cannot be ruled out on the Avon Valley Ramsar during the construction and operation stages of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

8.2 Stage 2 Appropriate Assessment

8.2.1 Scope

The following 10 sites were assessed at Stage 2 AA:

- The New Forest SAC (approximately 800m east)
- New Forest SPA (approximately 800m east)
- New Forest Ramsar (approximately 800m east)
- Dorset Heaths SAC (approximately 300m west)
- Dorset Heathlands SPA (approximately 300m west)
- Dorset Heathlands Ramsar (approximately 400m south-west)
- Solent and Dorset Coast SPA (approximately 7.3km south-east / 13.5km downstream)
- River Avon SAC (option is within the SAC boundary)
- Avon Valley SPA (option is within the SPA boundary)
- Avon Valley Ramsar (option is within the Ramsar boundary)

An assessment of each potential impact on the integrity of the designated sites is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 8.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

8.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

These measures are defined as industry-wide best practice measures to address common risks in the construction and development sectors and thus are proven to reduce the risk of the identified effects in so far as is reasonably possible.

It is assumed that no additional intake is required on the River Avon, and the existing intake location at Matchams will be used to transfer water to the Matchams WTW. However, a new outfall immediately upstream will be required for discharge of water abstraction from Ibsley Lake.

No assumptions on the water quality being discharged into the River Avon are made, thus adverse effects on water quality within the River Avon SAC, and Avon Valley SPA and Ramsar, are assumed as a worst-case precautionary approach.

The assumption, in the absence of detailed design or recent survey data, is that the land required for the construction of BNW14, and the immediate surrounds, is regularly used by significant numbers of qualifying species of all Habitats Sites assessed in this Appropriate Assessment. This includes wetland invertebrates and overwintering bird species associated with the New Forest SPA, Dorset Heathlands SPA and Avon Valley SPA and Ramsar. There is also an assumption that changes in groundwater levels from abstraction are as far-reaching as 5km.

All qualifying fish species of the River Avon SAC can be safeguarded from adverse effects of direct mortality through impingement and/or entrainment within the new outfall. This option will screen the intake to accommodate The Eels Regulations 2009, limiting the approach water velocity at the abstraction point. The application and success of this screening for alleviating adverse effects on qualifying features (and their preferred prey) will be secured through an Impingement and Entrainment Adaptive Management Plan.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option BNW14 and the 'Lower Dorset Stour and Lower Hampshire Avon' and 'Lower River Avon', that there may be potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. The WFD assessment concluded the confidence in the screening outcome is low, and therefore a precautionary approach is taken for this assessment; additional studies are required before a conclusion into the potential adverse effects during construction is possible. Any water transfer from the Lower Dorset Stour and Lower Hampshire Avon, and discharge into the River Avon, must be incorporated into the RBMP and the implications of future design changes on the conservation objectives of the Habitats Sites within the option's ZoI should be assessed in accordance with the 2017 Regulations.

Table 8.2: Potential adverse effects on integrity of Habitats Sites from option BNW14

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
The New Forest SAC (approximately 800m east)	All	This option may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary and degrade qualifying habitats and habitats which support qualifying features. ● Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functional land for supporting qualifying features. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. This option may have the following permanent effects on the Habitats Site during the operational phase: ● Water table availability – abstraction from the new borehole will reduce groundwater levels. ● Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functionally linked habitat for supporting qualifying features, as a result of changes to groundwater levels. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely	The following mitigation and best practice measures will be implemented to avoid or reduce adverse impacts, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Directional drilling, or other no-dig techniques, should be used within the riparian corridor of watercourses over 3m wide, where proposed new infrastructure interacts with the water environment. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce the likelihood of pollution events during construction. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.	the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
New Forest SPA (approximately 800m east)		This option may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary. ● Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functional land for supporting qualifying features. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. This option may have the following permanent effects on the Habitats Site during the operational phase: ● Water table availability – abstraction from the new borehole will reduce groundwater levels. ● Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functionally linked habitat for supporting qualifying features, as a result of changes to groundwater levels. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may	The following mitigation and best practice measures will be implemented to avoid or reduce adverse impacts, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Directional drilling, or other no-dig techniques, should be used within the riparian corridor of watercourses over 3m wide, where proposed new infrastructure interacts with the water environment. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce the likelihood of pollution events during construction. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage.	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.	Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
	Hobby (breeding)	In addition to the above applicable to all qualifying features, this option may also have the following temporary or permanent effects during the construction phase: ● Physical loss and/or damage – temporary loss of functionally linked habitat. Wetland habitats within the Avon valley may be key foraging areas to support hobbies during the breeding period. ● Non-physical disturbance - increased energy expenditure by qualifying features in response to construction related noise and visual disturbance, possibly resulting in displacement from preferred foraging or nesting areas and ultimately a reduction in breeding success and future population viability. No additional effects are anticipated on hobby in addition to those detailed above for all qualifying features during operation.	In addition to the mitigation measures detailed above for all qualifying features, the following may be required to alleviate adverse effects on breeding hobby, and should be progressed at the project stage: ● Sensitive timing of construction works to avoid the passage and overwintering period for birds detailed in the New Forest SPA supplementary advice note[23] during May to August inclusive; and ● Any works which are undertaken between May and August which may disturb or displace this species from suitable functional land will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population in the advice note, and works will be supervised by an ornithological watching brief.	

[23] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. New Forest Special Protection Area (SPA). Site code: UK9011031. Available at: European Site Conservation Objectives for New Forest SPA - UK9011031 (naturalengland.org.uk)

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			• Additional working methods which will reduce disturbance to breeding birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise. – Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark greens, grey or black will blend in to the background when moving. – All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. – All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical 'beeps'. This approach is considered to be precautionary in the absence of recent survey data. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
New Forest Ramsar	All	This option may have the following temporary or permanent effects on the Habitats Site during the construction phase:	The following mitigation and best practice measures will be implemented to avoid or reduce	No adverse effects

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
(approximately 800m east)		• Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary and degrade qualifying habitats and habitats which support qualifying features. • Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functional land for supporting qualifying features. • Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. This option may have the following permanent effects on the Habitats Site during the operational phase: • Water table availability – abstraction from the new borehole will reduce groundwater levels. • Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functionally linked habitat for supporting qualifying features, as a result of changes to groundwater levels. • Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site.	adverse impacts, and should be progressed at the project stage: • CIRIA C741 Environmental good practice on site guide. • Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). • Directional drilling, or other no-dig techniques, should be used within the riparian corridor of watercourses over 3m wide, where proposed new infrastructure interacts with the water environment. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce the likelihood of pollution events during construction. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level	

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.	assessment to conclude no adverse effect on site integrity during operation.	
Dorset Heaths SAC (approximately 300m west)	European dry heaths Wet heathland with cross-leaved heath Depressions on peat substrates Dry oak-dominated woodland Purple moor-grass meadows	This may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary and damage qualifying Annex I habitats. ● Physical loss and/or damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying habitats, as a result of the above impact pathway. This option may have the following permanent effects on the Habitats Site during the operational phase: ● Water table availability – abstraction from the new borehole will reduce groundwater levels. ● Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functionally linked habitat for supporting qualifying features, as a result of changes to groundwater levels. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution and extent of qualifying species.	The following mitigation and best practice measures will be implemented to avoid or reduce adverse effects, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Directional drilling, or other no-dig techniques, should be used within the riparian corridor of watercourses over 3m wide, where proposed new infrastructure interacts with the water environment. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce the likelihood of pollution events during construction. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			assessments, including hydrological modelling of the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
	Calcium-rich fen dominated by great fen sedge Calcium-rich springwater-fed fens Southern damselfly Great crested newt	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.
Dorset Heathlands SPA (approximately 300m west)	Dartford warbler (breeding)	This option may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary. ● Physical loss and/or damage – significant localised habitat loss and/or habitat degradation leading to a reduction in habitats which support qualifying features, as a result of the above impact pathway. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and	The following mitigation and best practice measures will be implemented to avoid or reduce adverse effects, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Directional drilling, or other no-dig techniques, should be used within the riparian corridor of watercourses over 3m wide, where proposed	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		extent of qualifying features, as a result of the above impact pathways. This option may have the following permanent effects on the Habitats Site during the operational phase: ● Water table availability – abstraction from the new borehole will reduce groundwater levels. ● Physical loss and/or damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functionally linked habitat for supporting qualifying features, as a result of changes to groundwater levels. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.	new infrastructure interacts with the water environment. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce the likelihood of pollution events during construction. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
	Nightjar (breeding) Woodlark (breeding)	In addition to the above applicable to all qualifying features, this option may also have the following temporary or permanent effects during the construction phase: ● Non-physical disturbance - increased energy expenditure by qualifying features in response to construction related noise and visual disturbance, possibly resulting in displacement from preferred	In addition to the mitigation measures detailed above for Dartford warbler, the following may be required to alleviate adverse effects on breeding species: ● Sensitive timing of construction works to avoid the passage and overwintering period for birds detailed in the Dorset Heathlands SPA	

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		foraging or nesting areas and ultimately a reduction in survival over winter and future population viability. ● Biological disturbance – displacement of qualifying features from foraging on breeding areas, resulting in the potential to jeopardise breeding success, adult survival and future population viability associated with the SPA. No other additional effects are anticipated on nightjar or woodlark in addition to those detailed above for Dartford warbler during operation.	supplementary advice note[24] during March to August inclusive. ● Any works which are undertaken between March and August which may disturb or displace this species from suitable functional land will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population in the advice note, and works will be supervised by an ornithological watching brief. ● Due to the sensitivity of these species to disturbance, it is recommended that the sensitive period above is avoided. If this is unavodable, additional mitigation measures may be required, such as the implementation of visual screening barriers erected around construction activities and plant movement routes, where works are taking place in or adjacent to habitats which may be considered functionally linked to the Habitats Site, or there is visual line of sight between construction activities and these habitats. ● Additional working methods which will reduce disturbance to overwintering birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise. – Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark	

[24] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Dorset Heathlands Special Protection Area (SPA). Site code: UK9010101. Available at: European Site Conservation Objectives for Dorset Heathlands SPA - UK9010101 (naturalengland.org.uk)

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			greens, grey or black will blend into the background when moving. – All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. – All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical 'beeps'. This approach is considered to be precautionary in the absence of recent survey data. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
	Hen harrier (overwintering) Merlin (overwintering)	In addition to the above applicable to all qualifying features, this option may also have the following temporary or permanent effects during the construction phase: ● Physical loss and/or damage – Temporary loss of functionally linked wetland habitats from pipeline installation within the Avon valley, which may support these species over winter. ● Non-physical disturbance - increased energy expenditure by qualifying features in response to construction related noise and visual disturbance,	In addition to the mitigation measures detailed above for Dartford warbler, the following may be required to alleviate adverse effects on overwintering species: ● Sensitive timing of construction works to avoid the passage and overwintering period for birds detailed in the Dorset Heathlands SPA supplementary advice note[25] during September to March inclusive. ● Any works which are undertaken between September and March which may disturb or	

[25] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Dorset Heathlands Special Protection Area (SPA). Site code: UK9010101. Available at: European Site Conservation Objectives for Dorset Heathlands SPA - UK9010101 (naturalengland.org.uk)

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		possibly resulting in displacement from preferred foraging or nesting areas and ultimately a reduction in survival over winter and future population viability. ● Biological disturbance - displacement of qualifying features from foraging areas, resulting in the potential to jeopardise over winter survival and future population viability associated with the SPA. No additional effects are anticipated on hen harrier or merlin in addition to those detailed above for Dartford warbler during operation.	displace this species from suitable functional land will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population in the advice note, and works will be supervised by an ornithological watching brief. ● Additional working methods which will reduce disturbance to overwintering birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise. – Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark greens, grey or black will blend into the background when moving. – All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. – All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical 'beeps'. This approach is considered to be precautionary in the absence of recent survey data. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage.	

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
Dorset Heathlands Ramsar (approximately 400m south-west)	All	This may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary and damage qualifying Annex I habitats. ● Physical loss and/or damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying habitats, as a result of the above impact pathway. This option may have the following permanent effects on the Habitats Site during the operational phase: ● Water table availability – abstraction from the new borehole will reduce groundwater levels. ● Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functionally linked habitat for supporting qualifying features, as a result of changes to groundwater levels. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution and extent of qualifying species.	The following mitigation and best practice measures will be implemented to avoid or reduce adverse effects, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Directional drilling, or other no-dig techniques, should be used within the riparian corridor of watercourses over 3m wide, where proposed new infrastructure interacts with the water environment. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce the likelihood of pollution events during construction. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
Solent and Dorset Coast SPA (approximately 7.3km south-east / 13.5km downstream)	All	No impact pathways were identified during construction. This option may have the following permanent effects on the Habitats Site during the operational phase: ● Water table availability – abstraction from the new borehole will reduce groundwater levels and base flow within the River Avon. ● Toxic contamination – reduced dilution in the reaches of the SPA which are downstream from the option, which may result in the degradation of river habitats which support suitable prey items, through chemical changes as a result of discharged water quality. ● Non-toxic contamination - reduced flows and water levels may lead to the degradation of river habitats which support suitable prey items, through increased suspended sediment, siltation and smothering of preferred foraging grounds. Nutrient enrichment of the watercourse which qualifying features' prey, caused by reductions in flow and water levels. ● Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in suitability within habitat which supports qualifying features, as a result of changes to water quality and flow. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The effects of toxic contamination, non-toxic contamination and physical loss and/or damage of habitat could be permanent effects but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		
River Avon SAC (option is within the SAC boundary)	Rivers with floating vegetation often dominated by water-crowfoot	This option may have the following temporary or permanent impacts on the qualifying Annex I habitats during the construction phase: ● Toxic contamination – pollution of the River Avon and groundwater catchment - which could be transferred throughout the Habitats Site boundary to areas of qualifying habitats, resulting in degradation which reduces the extent and/or distribution within the SAC. Air pollution on qualifying habitats which are in close proximity to proposed pipeline infrastructure. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off during construction of the intake and pipeline infrastructure. This could lead to increased silt deposition and smothering of floating vegetation throughout the SAC. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in qualifying habitats, as a result of the above impact pathways.	The following mitigation and best practice measures will be implemented to avoid or reduce adverse impacts, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Best practice such as 'Guidance Notes for the Reduction of Obtrusive Light' (Institute of Lighting Professionals, 2011) to avoid significant effects due to increased light (if works are programmed at night). ● Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. ● Directional drilling, or other no-dig techniques, should be used within the riparian corridor of watercourses over 3m wide, where proposed new infrastructure interacts with the River Camel and St Lawrence Stream. This includes a 10m buffer distance either side of the	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		This option may have the following permanent impacts on the qualifying Annex I habitats during operation: ● Water table availability – a reduction in flow and water level within the SAC due to the increased abstraction. This may affect both the surface water and groundwater resulting in degradation of qualifying habitats. ● Toxic contamination – reduced dilution in the reaches of the SAC which are downstream from the intake location, which may result in the degradation of qualifying habitats, particularly those woodlands which are present at the bankside. ● Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of qualifying habitats, particularly those woodlands which are present at the bankside. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in qualifying habitats' extent and/or distribution from the impact pathways above. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution and extent of qualifying Annex I habitats.	watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce direct impacts on the SAC and avoid the loss of in-channel and bankside habitats. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include[26]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible – Planning silt screening around the area of works to limit the movement and redeposition of material – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Works within the River Avon should be agreed with Natural England, to determine the appropriate measures taken to protect the surrounding Habitats Sites. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of	

[26] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
	Desmoulin's whorl snail Sea lamprey Brook lamprey Atlantic salmon Bullhead	In addition to the above applicable to the qualifying Annex I habitat, this option may also have the following temporary or permanent effects on these qualifying species during the construction phase: ● Non-physical disturbance – visual, noise, vibration and artificial light disturbance within the SAC boundary and close to functionally linked watercourses during construction may result in changes to feeding and migration behaviours. Disturbance can change regular behaviours, the use of preferred areas, migration success and ultimately adult survival and population viability. ● Biological disturbance – changes to habitat availability from the effects of toxic and non-toxic contamination, and habitat loss and/or damage, resulting in a reduction in future breeding success or adult survival. This can subsequently result in changes in distribution of populations associated with the SAC, through displacement to other, potentially sub-optimal, areas. Direct mortality of qualifying features from pipeline construction within and adjacent to the River Avon. In addition to the above applicable to the qualifying Annex I habitats during operation, this option may have the following permanent impacts on the qualifying species:	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed at the project stage: ● Maintain upstream and downstream passage for all fish during construction, with no physical barriers. ● Sensitive timing of construction works to avoid the key spawning and upstream migration season of qualifying fish species. ● Avoid working within the watercourse itself and limiting the length of the bankside working area. ● Retain bankside habitat cover outside of the SAC boundary, where possible. ● Scottish Environment Protection Agency's (SEPA) good practice guide for intakes and outfalls (WAT-SG-28). ● Environment Agency's best practice guide for screening intakes and outfalls (Science report SC030231). – Intake heads should be designed for slow suction velocity to further reduce impingement of freshwater biota against the intake screen. Heads should be fitted orthogonal to downstream currents to reduce forcing against the screens, thus minimising velocity of approach for	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		● Biological disturbance – direct mortality of qualifying fish species from entrainment within the new outfall structure. Changes to habitat availability from the effects of toxic and non-toxic contamination, and habitat loss and/or damage, leading to the displacement of these features within or from the SAC and jeopardising future spawning success, adult survival and population viability. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.	sensitive species. Where possible, installation works for the intake should also avoid important nursery/spawning grounds of qualifying species. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Works within the River Avon should be agreed with Natural England, to determine the appropriate measures taken to protect the surrounding Habitats Sites. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
Avon Valley SPA (option is within the SPA boundary)	All	This option may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater catchment which could be transferred to within the Habitats Site boundary. Air pollution on qualifying habitats which are in close proximity to proposed pipeline infrastructure.	The following mitigation and best practice measures will be implemented to avoid or reduce adverse effects, and should be progressed at the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6:	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		• Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off during construction of the intake and pipeline infrastructure. This could lead to increased silt deposition and smothering of supporting habitats. • Physical loss and/or damage – significant localised habitat loss and/or habitat degradation leading to a reduction in habitat for supporting qualifying features, as a result of the above impact pathways. • Non-physical disturbance - increased energy expenditure by qualifying features in response to construction related noise and visual disturbance, possibly resulting in displacement from preferred foraging or nesting areas and ultimately a reduction in survival over winter and future population viability. • Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. This option may have the following permanent effects on the Habitats Site during the operational phase: • Water table availability – abstraction from the new borehole will reduce groundwater levels, potentially degrading supporting habitats within the SPA boundary and functionally linked habitat. • Toxic contamination – reduced dilution in the reaches of the SAC which are downstream from the intake and discharge locations, which may result in the degradation of habitats which support qualifying features. • Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of habitats which support qualifying	Pollution prevention guidance for working at construction and demolition sites). • Best practice such as ‘Guidance Notes for the Reduction of Obtrusive Light’ (Institute of Lighting Professionals, 2011) to avoid significant effects due to increased light (if works are programmed at night). • Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. • Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide, where proposed pipeline alignments bisect them, and suitable functionally linked floodplain grazing marsh. This includes a 10m buffer distance either side of the watercourses and habitat edges to limit impact pathways into the watercourses and habitats. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed or the underlying water table. This will reduce direct impacts on the SPA and the supporting habitats within. • Specific mitigation to reduce increased sedimentation and silt deposition downstream include: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible – Planning silt screening around the area of works to limit the movement and redeposition of material. – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport.	

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		features. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss/damage – significant localised habitat loss and/or habitat degradation leading to a reduction in qualifying features and/or functionally linked habitat for supporting qualifying features, as a result of changes to groundwater levels. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of displacement from the above impact pathways. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.	● Sensitive timing of construction works to avoid the passage and overwintering period for birds detailed in the Avon Valley SPA citation during November to March inclusive. ● Any works which are undertaken between November and March which may disturb or displace this species from suitable functional land will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population in the advice note and works will be supervised by an ornithological watching brief. ● Additional working methods which will reduce disturbance to overwintering birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise. – Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark greens, grey or black will blend in to the background when moving. – All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. – All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical ‘beeps’.	

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			This approach is considered to be precautionary in the absence of recent survey data. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Works within the River Avon and Avon Valley should be agreed with Natural England, to determine the appropriate measures taken to protect the surrounding Habitats Sites. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of the proposed abstraction and transfer from Ibsley Lake to the River Avon. The operational limits of the abstraction and transfer from Ibsley Lake to the River Avon that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
Avon Valley Ramsar (option is within the Ramsar boundary)	Habitats listed under criterion 1	See “Possible adverse effects before mitigation” listed above for ‘Rivers with floating vegetation often dominated by water-crowfoot’ for the River Avon SAC. There are additional habitats listed within Ramsar criterion 1 which could be adversely affected by this option, although the impact pathways for habitats directly affected by the proposed option are the same.	See “mitigation measures” listed above for for ‘Rivers with floating vegetation often dominated by water-crowfoot’ for the River Avon SAC.	No adverse effects.

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
	Nationally rare wetland plant and invertebrate species (criterion 2)	See “Possible adverse effects before mitigation” listed above for ‘Rivers with floating vegetation often dominated by water-crowfoot’ for the River Avon SAC. In addition to the above applicable to the qualifying Annex I habitat of the River Avon SAC, this option may also have the following temporary or permanent effects on these qualifying species during the construction phase: ● Biological disturbance – changes to habitat availability from the effects of toxic and non-toxic contamination, and habitat loss and/or damage, resulting in a reduction in future expansion or survival. This can subsequently result in changes in distribution of populations associated with the Ramsar. Direct mortality of qualifying features from pipeline construction within and adjacent to the option. In addition to the above applicable to the qualifying Annex I habitats of the River Avon SAC during operation, this option may have the following permanent impacts on the qualifying species: ● Biological disturbance – changes to habitat availability from the effects of toxic and non-toxic contamination, and habitat loss and/or damage, leading to the displacement of these features within or from the Ramsar and jeopardising future colonisation, expansion, adult survival and population viability. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised.	See “mitigation measures” listed above for for ‘Rivers with floating vegetation often dominated by water-crowfoot’ for the River Avon SAC.	

Habitats Site	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		
	Bird species listed under criterion 6: Gadwall (overwintering) Pintail (overwintering) Black-tailed godwit (overwintering)	See “Possible adverse effects before mitigation” listed above for all features of the Avon Valley SPA.	See “Indicative mitigation measures” listed above for all features of the Avon Valley SPA.	

Source: Mott MacDonald Limited, 2023

8.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on any of the Habitats Sites during the construction phase, provided the recommended mitigation measures are implemented at the project level. Mitigation which may be progressed at the project stage could include pre-construction surveys, timing restrictions of works, habitat avoidance via directional drilling, toolbox talks, habitat management and the presence of an Ecological Clerk of Works (ECoW). The construction of the option lies within the boundary of the River Avon SAC, Avon Valley SPA and Avon Valley Ramsar. Therefore, consent from Natural England is required before any works can begin.

No adverse effect on site integrity can be concluded for option BNW14 during operation, on the understanding that further research identified in the conclusion of this Appropriate Assessment, and within the WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. Mitigation measures have been proposed for construction phases at all sites. Nevertheless, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydro-geological studies and groundwater monitoring to determine the area affected by reduced groundwater levels associated with the proposed pipeline and abstraction from Ibsley Lake, and any interaction there may be with GWDTE, within the ZoI.
- A desk-based hydro-geological assessment is required when more information is available to ensure that the pipeline installation proposed does not cause subsidence of the riverbed on Dockens Water, Lin Brook and Bickerley Millstream.
- Hydro-ecology studies and hydrodynamic modelling of flows to identify whether the changes in the water levels from the new abstraction would have an adverse effect on the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites within the ZoI, and their qualifying features.
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential adverse effects on the Habitats Sites within the ZoI. Future modelling will need to be refined once further information is available.
- Desk based noise assessment to determine extent of the ZoI once more information is available on construction methodology.
- Evaluation and modelling of emissions from traffic (heavy goods vehicles), plant and non-road mobile machinery to determine if heavy goods vehicle restrictions are required during construction works within close proximity to the River Avon SAC, Avon Valley SPA, Avon Valley Ramsar, Dorset Heaths SAC and Dorset Heathlands SPA.

- River condition assessments to assess the condition of the River Avon, Dockens Water, Lin Brook and Bickerley Millstream prior to construction, to determine the location of qualifying features and supporting habitat within the ZoI (specifically water courses of plain to montane levels with the water-crowfoot and *Callitricho-Batrachion* vegetation). This will allow estimation of construction impacts and potential degradation in site condition.
- Adapted river habitat surveys of Dockens Water, Lin Brook and Bickerley Millstream to determine if suitable spawning habitat is present for Atlantic salmon, sea lamprey, brook lamprey and bullhead (mapping of silt beds, gravel, riffles, glides, runs, shelter etc.) within the ZoI.
- A detailed review of the baseline ecological data for qualifying birds and invertebrates to inform the requirement for additional monitoring and to determine more targeted mitigation measures. This is likely to include breeding and wintering birds, Desmoulin's whorl snail and wetland plant and invertebrate surveys.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

A Construction Environmental Management Plan will be put in place, including the proposed mitigation measures in this document as well as any additional measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

9 COL15 Restormel WTW – increase treatment capacity to 110 Ml/dMl/d

9.1 Stage 1 Screening

The Stage 1 Screening identified four Habitats Sites within the ZoI of COL15 (Table 9.1). LSE were ruled out for all four of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 9.1: COL15 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
	Breney Common and Goss & Tregoss Moors SAC (approximately 3.5km west)
	River Camel SAC (approximately 7km north)
	Polruan to Polperro SAC (approximately 12km downstream)
	Falmouth Bay to St. Austell Bay SPA (approximately 9.5km south and 13km downstream)

Source: Mott MacDonald Limited, 2023

9.1.1 Breney Common and Goss & Tregoss Moors SAC

There is no hydrological connectivity between this SAC and the option. The option is outside of the SSSI IRZ associated with this SAC and therefore it is unlikely that there will be any significant effects during construction.

There are no impact pathways present during operation, as additional abstraction will only affect ecosystems which are downstream of the River Fowey.

9.1.2 River Camel SAC

There is no hydrological connectivity between this SAC and the option. The option is outside of the SSSI IRZ associated with this SAC and therefore it is unlikely that there will be any significant effects during construction.

There are no impact pathways present during operation, as additional abstraction will only affect ecosystems which are downstream of the River Fowey.

9.1.3 Polruan to Polperro SAC

This site is hydrologically connected to the southern end of the option via the River Fowey and WFD groundwater waterbody GB40802G806600 (Looe and Fowey). However, the option is outside of the SSSI IRZ associated with this SAC and therefore it is unlikely that there will be any significant effects during construction.

There is no direct interface between the option and the site, due to the qualifying features being on or above the cliff faces and do not interact with the River Fowey. As a result, any changes in flow or water quality from the increased abstraction upstream will not be affect the SAC.

9.1.4 Falmouth Bay to St. Austell Bay SPA

There are no infrastructure changes for this option and therefore no likely significant effects during a construction phase.

This site is hydrologically connected to the southern end of the option via WFD groundwater waterbody GB40802G806600 (Looe and Fowey). However, the option is sufficiently distant from the SPA (9.5km) that no significant effects during construction are anticipated. There is no SSSI IRZ associated with this SPA as a reference.

The qualifying features of the site are marine specialist and will not be affected by a reduction in flow into the bay, through prey availability or water quality/quantity. As a result, there are no anticipated effects during operation.

It is considered that no likely significant effects are anticipated on the any of the four Habitats Sites. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Habitats Sites of their qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, these Habitats Sites are not considered further.

10 COL22 Roadford to Colliford via Saltash

10.1 Stage 1 Screening

The Stage 1 Screening identified two Habitats Sites within the ZoI of COL22 (Table 10.1). LSE could not be ruled out for either of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B.

Table 10.1: COL22 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
Plymouth Sound & Estuaries SAC (approximately 800m east)	Phoenix United Mine & Crow's Nest SAC (approximately 9.5km west)
Tamar Estuaries Complex SPA (approximately 800m east)	

Source: Mott MacDonald, 2023

10.1.1 Plymouth Sound & Estuaries SAC

The construction works between Winstone Beacon WTW and Kit Hill WTW associated with the option are not hydrologically connected to the SAC via surface water. However, this option lies within the SSSI IRZ associated with this SAC (Lynher Estuary SSSI and Tamar – Tavy Estuary SSSI) and there is hydrological connectivity through the WFD groundwater waterbody ID GB40802G806700 (Tamar).

Due to this hydrological connectivity, it is possible that any pollution events (toxic or non-toxic) could be transferred to within the SAC boundary and impact qualifying features. Qualifying Annex I habitats may be degraded through pollution, as could other habitats on which qualifying Annex II species rely. This habitat degradation may result in changes to the population sizes, extent and distribution of qualifying habitats and species within the site.

The site is considered sufficiently distant from the option that no other impact pathways are present during construction.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

Likely significant effects cannot be ruled out on the Plymouth Sound & Estuaries SAC during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

10.1.2 Tamar Estuaries Complex SPA

The construction works between Winstone Beacon WTW and Kit Hill WTW associated with the option are not hydrologically connected to the SAC via surface water. However, this option lies within the SSSI IRZ associated with this SAC (Lynher Estuary SSSI and Tamar – Tavy Estuary SSSI) and there is hydrological connectivity through the WFD groundwater waterbody ID GB40802G806700 (Tamar).

Due to this hydrological connectivity, it is possible that any pollution events (toxic or non-toxic) could be transferred to within the SPA boundary and impact qualifying features. The habitats of

which the SPA is composed, including intertidal mudflat communities, areas of mixed muddy sediment communities and saltmarsh communities may be degraded through pollution. These habitats provide important feeding and roosting areas for the qualifying species avocet *Avosetta recurvirostra* and little egret *Egretta garzetta*, with the mudflats supporting high densities and variety of invertebrates, a vital food course for these bird species. Therefore, as a result of pollution these food resources and refuges may be lost and result in displacement of qualifying features to sub-optimal areas. The effects of displacement may be temporary or permanent, and result in changes to the extent, distribution and population sizes of qualifying features within or from the site.

The habitats surrounding the option are not considered to be functionally linked to the SPA and therefore the qualifying features are assumed to be absent from the option and surrounding habitats.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

Likely significant effects cannot be ruled out on the Tamar Estuaries Complex SPA during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

10.1.3 Phoenix United Mine & Crow's Nest SAC

There is a hydrological connection between the option and the SAC via the WFD groundwater waterbody ID GB40802G806700 (Tamar). However, this is outside the SSSI IRZ associated with the SAC (Phoenix United Mine SSSI) and is therefore sufficiently distant that no significant effects are anticipated during construction.

There are no impact pathways during operation and therefore no significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the Phoenix United Mine & Crow's Nest SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

10.2 Appropriate Assessment

10.2.1 Scope

The following sites were assessed at Stage 2 AA:

- Plymouth Sound & Estuaries SAC (approximately 800m east)
- Tamar Estuaries Complex SPA (approximately 800m east)

An assessment of each potential impact on the integrity of the designated sites is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 10.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

10.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

These measures are defined as industry-wide best practice measures to address common risks in the construction and development sectors and thus are proven to reduce the risk of the identified effects in so far as is reasonably possible.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option COL22, there was no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. All waterbodies were screened out for significant effects at the Level 1 assessment. The WFD assessment concluded the confidence in the screening outcome is low, and so temporary effects of pollution transferred through the surface water during construction have been assessed as a precautionary approach to the HRA.

Table 10.2: Potential adverse effects on integrity of Habitats Sites from option COL22

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
Plymouth Sound & Estuaries (approximately 800m east)	All	This option may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater, which could be transferred downstream to within the SAC and degrade qualifying Annex I habitats and habitats which support qualifying features. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off into nearby tributaries flowing into the estuary. This could lead to increased silt deposition and smothering within the SAC boundary. ● Physical loss and/or damage – significant localised habitat degradation leading to a reduction in the extent and/or distribution of qualifying Annex I habitats and shore dock, from the impact pathways above. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species No adverse effects are identified during operation.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	No adverse effects
Tamar Estuaries Complex (approximately 800m east)	All	This option may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the groundwater, which could be transferred downstream to within the SPA and degrade habitats and reduce prey availability of species which support qualifying features.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6:	No adverse effects

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
		● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off into nearby tributaries flowing into the estuary. This could lead to increased silt deposition and smothering within the SPA boundary, reduce supporting habitats and prey availability for qualifying features. ● Physical loss and/or damage – significant localised habitat degradation leading to a reduction in the extent and/or distribution of habitats and prey which support qualifying features, from the impact pathways above. ● Biological disturbance - reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution and extent of qualifying features, as a result of the above impact pathways. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species No adverse effects are identified during operation.	Pollution prevention guidance for working at construction and demolition sites). The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	

Source: Mott MacDonald, 2023

10.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on either of the Habitats Sites during the construction phase, provided the recommended mitigation measures are implemented at the project level. Mitigation which may be progressed at the project stage should include the implementation of best practice pollution control methods. No other targeted mitigation is considered necessary based on the current design.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

A Construction Environmental Management Plan will be put in place, including the proposed mitigation measures in this document as well as any additional measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

11 ROA7 Expansion of Northcombe WTW to 60 Ml/dMl/d

11.1 Stage 1 Screening

The Stage 1 Screening identified two Habitats Sites within the ZoI of ROA7 (Table 11.1). LSE could be ruled out for both of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 11.1: ROA7 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
	Culm Grasslands SAC (approximately 4.5km north)
	Dartmoor SAC (approximately 9km south-east)

Source: Mott MacDonald Limited, 2023

11.1.1 Culm Grasslands SAC

Although there is hydrological connectivity between the SAC and the option, via the WFD groundwater waterbody ID GB40802G800600 (Torridge and Hartland Streams), this option is outside the SSSI IRZ associated with this SAC and therefore sufficiently distant that no significant effects are anticipated during construction.

Significant effects on the groundwater catchment (Torridge and Hartland Streams) were screened out during the WFD Level 1 assessment, and therefore no significant effects on the SAC from increased abstraction at the Roadford Lake are anticipated during operation.

11.1.2 Dartmoor SAC

Although this site is hydrologically connected via the WFD groundwater waterbody ID GB40802G806700 (Tamar), it is sufficiently distant from the proposed works that no likely significant effects are anticipated during construction.

Significant effects on the groundwater catchment (Tamar) were screened out during the WFD Level 1 assessment, and therefore no significant effects on the SAC from increased abstraction at the Roadford Lake are anticipated during operation.

It is considered that no likely significant effects are anticipated on either of the two Habitats Sites. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Habitats Sites of their qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, these Habitats Sites are not considered further.

12 ROA17 Littlehempston WTW

12.1 Stage 1 Screening

The Stage 1 Screening identified four Habitats Sites within the ZoI of ROA17 (Table 12.1). LSE could not be ruled out for two of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 12.1: ROA17 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
South Hams SAC (approximately 5.1km north-west)	Lyme Bay and Torbay SAC (approximately 3.5km south-east / 17.6km downstream)
Dartmoor SAC (approximately 13km north-west / 36km upstream)	South Dartmoor Woods SAC (approximately 9.5km north-west)

Source: Mott MacDonald Limited, 2023

12.1.1 Lyme Bay and Torbay SAC

This site is hydrologically connected to the option downstream on the River Dart, and via the WFD groundwater waterbody IDs GB40802G800700 (Teign, Avon, Dart and Erme) and GB40801G801500 (Torquay). This distance through groundwater waterbody GB40802G800700 (13.6km) and the River Dart (17.6km) is sufficient that no significant effects from pollution events, if they were to occur during construction, are anticipated. Similarly, although it is possible that pollution events are transferred through the groundwater via GB40801G801500, the qualifying features of the SAC are habitats within the marine environment and not GWDTE. Therefore, no likely significant effects are anticipated, even in the event of pollution incidents. There is no SSSI IRZ associated with this SAC for reference.

There are no impact pathways between the option and the site during operation.

It is considered that no likely significant effects are anticipated on Lyme Bay and Torbay SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

12.1.2 South Hams SAC

Although this site is hydrologically connected via the WFD groundwater waterbody GB40802G800700 (Teign, Avon, Dart and Erme), it is sufficiently distant (5.1km) from the proposed works that that no likely significant effects on qualifying Annex I habitats within the SAC boundary are anticipated during construction.

However, as one of the qualifying features of this site is bats, and highly mobile, additional effects on functionally connected areas needs to be assessed to determine potential effects. The westernmost end of the proposed pipeline (approximately 1.8km in length) exists within the 4km Sustenance Zone (SZ) around the designated greater horseshoe *Rhinolophus ferrumequinum* maternity roost at High Marks Barn SSSI, which supports the second largest maternity roost for this species in England. Within this SZ, proposals which impact upon suitable foraging habitat and commuting routes may have a likely significant effect on the SAC population. As the option bisects agricultural fields, woodlands and watercourses within the

sustenance zone, there is the potential for significant effects on the maternity colony associated with High Marks Barn SSSI. Additional disturbance may also arise from additional artificial light required during the construction phase. There is also the potential for pollution events inside the SZ to degrade suitable foraging habitats or commuting routes, displacing bats from preferred foraging areas.

The remainder of the option is outside of the 4km Sustenance Zone for the greater horseshoe bat but sits within the wider Landscape Connectivity Zone (LCZ). These areas have been mapped around the SAC and key species' roosts outside of the SAC, to help connect the SAC to other populations for the purpose of maintaining genetic diversity and resilience. Because the option is not within 4km of any designated roosts (the SZ), there is not expected to be a significant effect on the SAC population from damage/destruction of foraging habitat or commuting route. Within the LCZ, greater horseshoes associated with the SAC are dispersed and only found in relatively low numbers. This part of the option is not anticipated to have an impact on foraging or commuting habitats at a landscape scale (as construction footprints are narrow and temporary) and therefore no significant effects from loss/damage to functionally linked habitat is anticipated elsewhere.

However, there is a 'Pinch Point' within the option, on the River Dart in Totnes. Pinch Points are known or potential greater horseshoe commuting routes which are significantly restricted, for example due to urban encroachment. Further restriction to Pinch Points could significantly impact the movements of greater horseshoes and potentially have a significant effect on the SAC. This option will not result in any permanent impacts on this Pinch Point, or other suitable commuting corridors such as the River Hems, but there may be temporary impacts and disturbance during the construction phase. Details of functionally linked habitat, commuting routes, Pinch Points and mitigation areas for the SAC's population are detailed within the South Hams SAC guidance[27] and Devon County Council environment viewer[28].

There are no other potential impact pathways during construction, due to the distance between the option and the site (5.1km at the closest point). None of the other qualifying features will be affected by this option during construction.

There are no impact pathways between the option and any of the qualifying features during operation.

Likely significant effects cannot be ruled out on the South Hams SAC during the construction stage of the works. As such this designated site has been progressed to Stage 2 Appropriate Assessment.

12.1.3 Dartmoor SAC

Although this site is hydrologically connected upstream on the River Dart and via the WFD groundwater waterbody GB40802G800700 (Teign, Avon, Dart and Erme), it outside of the SSSI IRZ associated with the SAC and therefore is sufficiently distant from the proposed works that no likely significant effects from pollution events, if they were to occur during construction, are anticipated.

The River Dart is connected to the site via the East- and West Dart Rivers and River Swincombe, with the option footprint approximately 36km downstream of the SAC at the closest point. Otter and Atlantic salmon are qualifying features which may utilise the River Dart

[27] Dartmoor National Park Authority, Devon County Council, Teignbridge District Council, South Hams District Council, Torbay Council and Natural England (2019). South Hams Special Area of Conservation (SAC). Greater Horseshoe Bats. Habitats Regulations Assessment Guidance [online] available at: sac-greaterhorseshoebats.pdf (torbay.gov.uk)

[28] Devon County Council (2023). Devon County Council Environmental Viewer [online] available at: Devon County Council Environment Viewer

downstream of the SAC boundary, making this watercourse functionally linked habitat for these features. Otter populations associated with the SAC may commute and forage on the river, even at this distance from the site boundary. Any pollution events which affect the river may impact water quality and prey availability and displace them from preferred foraging areas. Where the pipeline crosses the River Dart in Totnes, there are suitable woodland and floodplain grazing marsh habitats which may be used by otters as resting sites, and there is therefore potential for disturbance during construction activities. Disturbance to qualifying species may jeopardise adult fitness, survival rates and future breeding success. Effects of displacement may be temporary or long-lasting and may result in redistribution within or from a site.

Atlantic salmon are known to migrate into the Dartmoor SAC through the River Dart. It is possible that any pollution events which affect the river could have a significant effect on salmon, changing water quality downstream of the option. Maintaining good water quality is stated as a target for supporting salmon populations in the conservation objectives supplementary advice for Dartmoor SAC. Although these impacts would be outside the SAC boundary, they could be within functionally linked habitat and significantly affect salmon which use the River Dart to migrate to and from spawning grounds upstream within the SAC. This could result in direct mortality to individual fish and displace populations from the SAC if habitat suitability of migration routes becomes degraded. Construction activities within the riparian corridor may also disturb salmon and alter their behaviour, jeopardising their upstream migration and future viability of the SAC population if during sensitive periods.

The functionally linked habitat for otter is considered sensitive to changes in air quality, including broadleaved woodland. Based on publicly available data from 2020 (2019 – 2021 three-year average)[29], nitrogen deposition within functionally linked habitats is between 10.2 – 10.4kg/ ha/ year on average. Both nitrogen oxides and sulphur dioxide are below the critical level with nitrogen oxides at 4.4µg m^{-3} with a critical level of 30µg m^{-3} and sulphur dioxides at 0.5µg m^{-3} with a critical level of 20µg m^{-3}. Therefore, it is not anticipated that construction works will have an adverse effect on air quality in relation to the functionally linked habitat critical levels.

Due to the distance between the option and the SAC (13km), no other impact pathways are present during construction.

There are no impact pathways between the option and the site during operation.

Likely significant effects cannot be ruled out on the Dartmoor SAC during the construction stage of the works. As such this designated site has been progressed to Stage 2 Appropriate Assessment.

12.1.4 South Dartmoor Woods SAC

Although the site is hydrologically connected via the WFD groundwater waterbody GB40802G806700 (Tamar), the option is outside of the SSSI IRZ associated with this SAC (Hembury Woods SSSI) and is therefore sufficiently so that no likely significant effects are anticipated during construction or operation.

It is considered that no likely significant effects are anticipated on the South Dartmoor Woods SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

[29] Air Pollution Information System (2021). Site Relevant Critical Loads and Source Attribution (APIS GIS map tool). Accessed from: APIS app | Air Pollution Information System

12.2 Appropriate Assessment

12.2.1 Scope

The following two sites were assessed at Stage 2 AA:

- South Hams SAC (approximately 5.1km north-west)
- Dartmoor SAC (approximately 13km north-west / 36km upstream)

An assessment of each potential impact on the integrity of the Habitats Sites is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 12.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

12.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

It is assumed that otters which are part of the Dartmoor SAC population regularly use the River Dart as far downstream of the SAC as Totnes, and therefore may be significantly affected by the construction of the option in this area.

It is also assumed that high densities of the Atlantic salmon population associated with the Dartmoor SAC use the River Dart as a migration route, over other rivers which connect the SAC to the English Channel.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option ROA17, there was no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. All waterbodies were screened out for significant effects at the Level 1 assessment. The WFD assessment concluded the confidence in the screening outcome is low, and so temporary effects of pollution transferred through the surface water during construction have been assessed as a precautionary approach to the HRA.

Table 12.2: Potential adverse effects on integrity of Habitats Sites from option ROA17

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
South Hams SAC (approximately 5.1km north-west)	Greater horseshoe bat	This option may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of functionally linked watercourse and terrestrial habitats, such as woodland and grasslands ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off. This could lead to increased silt deposition and smothering in suitable foraging habitats, such as woodland streams. ● Physical loss/damage – significant localised habitat loss and/or degradation leading to a reduction in the extent and/or distribution of foraging habitat and/or commuting routes within the Sustenance Zone. ● Non-physical disturbance – visual, noise and artificial light disturbance close to foraging habitats and commuting routes during construction may result in changes to feeding behaviours. Bats may be foraging or commuting along the River Dart, wooded streams, woodland edges or hedgerows and therefore disturbance can change regular behaviours and use of preferred areas. ● Biological disturbance - increased energy expenditure by qualifying features in response to construction related noise and visual disturbance, possibly resulting in displacement from preferred foraging habitats or commuting routes. A reduction in available functionally linked habitat availability for greater horseshoe bat. Both can subsequently result in changes in distribution of populations associated with the SAC, as a result of the above impact pathways.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Specific mitigation to reduce increased sedimentation and silt deposition include[30]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide and suitable functionally linked habitats (such as grassland and woodland), where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourses and woodlands to limit impact pathways into these habitats. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the watercourse bed. This will reduce indirect effects of pollution downstream	No adverse effects

[30] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
		The effects of toxic contamination, non-toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the nature of the option (narrow working corridors and short construction periods). No adverse impacts are identified during operation.	within the watercourses. This applies to the River Dart crossing at Totnes (Pinch Point), and smaller wooded streams within the Sustenance Zone. ● Retention of other foraging and commuting habitats such as grassland and hedgerows, where possible. Limit severance of linear features which may be commuting routes, such as hedgerows, to gaps which are no more than 10m wide. ● Replanting of any lost vegetation, including grassland used for foraging and hedgerows/other linear features used for commuting, with appropriate native species (or translocation of previously removed vegetation) to ensure any losses are temporary only. ● Sensitive timing of construction works to avoid periods of highest bat activity, i.e. daytime working only. This will alleviate the need for artificial lighting which could otherwise cause disturbance. ● Best practice such as 'Guidance Notes for the Reduction of Obtrusive Light' (Institute of Lighting Professionals, 2011) to avoid significant effects due to increased light (if works are programmed at night) ● Avoidance of buildings and structures which may be used as roosts by horseshoe bats. Provide a buffer of at least 50m from such features to avoid disturbance through noise and vibration. ● If a confirmed roost is directly or indirectly impacted (i.e. through loss/damage, or noise/vibration/light disturbance), then a Natural England protected species licence will be required before works start, which will detail	

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			specific measures to avoid offences and compensation measures to replace the lost roost. The development of a Construction and Environmental Management Plan which will include all the above proposed mitigation measures and any further measures identified at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
	All qualifying Annex I habitats	There are no impact pathways identified for this qualifying feature. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.
Dartmoor SAC (approximately 13km north-west / 36km upstream)	Otter	Option ROA17 may have the following permanent impacts on the Habitats Site during the construction phase: ● Toxic contamination – pollution of functionally linked watercourses outside of the Habitats Site boundary, reducing water quality and prey availability of otters. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off. This could lead to increased silt deposition and smothering in suitable foraging habitats, such as the River Dart. ● Physical loss/damage – significant localised habitat loss and/or degradation leading to a reduction in the extent and/or distribution potential resting site locations at or near main watercourses. ● Non-physical disturbance – visual, noise, vibration and artificial light disturbance close to foraging habitats and resting sites during construction may result in changes to	The following measures will be implemented to avoid or reduce adverse impacts: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Specific mitigation to reduce increased sedimentation and silt deposition include[31]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and	No adverse effects

[31] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
		feeding and breeding behaviours. Otters may be foraging within the River Dart or other nearby watercourses and therefore disturbance can change regular behaviours, the use of preferred areas and breeding success. ● Biological disturbance - increased energy expenditure by qualifying features in response to construction related disturbance, possibly resulting in displacement from preferred foraging habitats, breeding sites or commuting routes and ultimately a reduction in breeding success or adult survival. This can subsequently result in changes in distribution of populations associated with the SAC, as a result of the above impact pathways. The effects of toxic contamination, non-toxic contamination and physical loss/damage of habitat could be permanent impacts but are likely to be localised due to the nature of the option (narrow working corridors and short construction periods). No adverse impacts are identified during operation.	– Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide and suitable habitats for resting sites (such as scrub and woodland), where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce indirect effects of pollution downstream within the River Dart. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include[32]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Sensitive timing of construction works to avoid the periods of greatest otter activity, i.e. no night-time working ● Best practice such as ‘Guidance Notes for the Reduction of Obtrusive Light’ (Institute of Lighting Professionals, 2011) to avoid	

[32] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			significant effects due to increased light (if works are programmed at night) ● Retain bankside habitat cover and other suitable adjacent habitats where possible. ● Pre-commencement otter survey to ensure that no breeding or resting sites are present within the Zone of Influence (ZoI) of the works. ● Potential resting sites should be monitored using cameras (requires Natural England licence). A 30m protection zone around confirmed resting sites is required during construction. This distance is extended to 150m for confirmed breeding sites. ● If holts require closure and destruction to facilitate construction, artificial replacements will be required on the same watercourse away from the works area. These must be in-situ before construction starts. This work will require a Natural England licence. The development of a Construction and Environmental Management Plan which will include all the above proposed mitigation measures and any further measures identified at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
	Atlantic salmon	Option ROA17 may have the following permanent impacts on the Habitats Site during the construction phase: ● Toxic contamination – pollution of functionally linked watercourses outside of the Habitats Site boundary, reducing water quality and habitat suitability for salmon. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-	The following measures will be implemented to avoid or reduce adverse impacts: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites).	No adverse effects

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
		off. This could lead to increased silt deposition and smothering in suitable migration routes, such as the River Dart. ● Physical loss/damage – significant localised habitat degradation leading to a reduction in the extent of suitable habitat within main watercourses. ● Non-physical disturbance – visual, noise, vibration and artificial light disturbance close to functionally linked watercourses during construction may result in changes to feeding and migration behaviours. Disturbance can change regular behaviours, the use of preferred areas and migration success. ● Biological disturbance – changes to habitat availability from the above impact pathways, resulting in a reduction in future breeding success or adult survival. This can subsequently result in changes in distribution of populations associated with the SAC. The effects of toxic contamination, non-toxic contamination and physical loss/damage of habitat could be permanent impacts but are likely to be localised due to the nature of the option (narrow working corridors and short construction periods). No adverse impacts are identified during operation.	● Specific mitigation to reduce increased sedimentation and silt deposition include[33]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide, where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce indirect effects of pollution downstream within the River Dart. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include[34]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and	

[33] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

[34] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			– Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Sensitive timing of construction works to avoid key spawning and upstream migration of salmon (November to February inclusive) ● Best practice such as 'Guidance Notes for the Reduction of Obtrusive Light' (Institute of Lighting Professionals, 2011) to avoid significant effects due to increased light (if works are programmed at night) ● Maintain upstream and downstream passage for all fish, with no physical barriers during construction. The development of a Construction and Environmental Management Plan which will include all the above proposed mitigation measures and any further measures identified at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
	All qualifying Annex I habitats Southern damselfly	There are no impact pathways identified for this qualifying feature. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.

Source: Mott MacDonald Limited, 2023

12.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on any of the Habitats Sites during the construction phase, provided the recommended mitigation measures, are implemented at the project level. Mitigation which may be progressed at the project stage could include the use of best-practice pollution and sediment control measures, surface watercourse and woodland habitat avoidance via directional drilling, habitat retention and replacement (if necessary), sensitive timings of works and, if required, Natural England licences for otter and/or greater horseshoe bats.

No impact pathways during the operational phase of the option have been identified on Habitats Sites or their qualifying features.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Evaluation and modelling of emissions from traffic (heavy goods vehicles), plant and non-road mobile machinery to determine if heavy goods vehicle restrictions are required during construction works within close proximity to functionally linked habitats for qualifying features of the South Hams SAC (greater horseshoe bat) and Dartmoor SAC (otter and Atlantic salmon).
- Desk based noise assessment to determine extent of the ZoI once more information is available on construction methodology.
- A desk-based hydro-geological assessment is required when more information is available to ensure that the pipeline installation proposed does not cause subsidence of the riverbed on the River Dart.
- Bat activity surveys are recommended to determine the presence or likely absence of greater horseshoe bats surrounding the proposed pipeline construction within the SZ associated with High Marks Barn SSSI, and how this species utilises the habitats present surrounding the option.
- A detailed review of the baseline ecological data for bats, otter and fish to inform the requirement for additional monitoring and to determine more targeted mitigation measures. This is likely to include otter and fish surveys on the River Dart and other bisected watercourses.
- River condition assessments to assess the condition of the River Dart prior to construction, to determine the location of qualifying features and supporting habitat within the functionally linked habitat. This will allow estimation of construction impacts and potential degradation in site condition.
- Adapted river habitat surveys of the River Dart to determine if suitable spawning habitat is present for Atlantic salmon, (mapping of silt beds, gravel, riffles, glides, runs, shelter etc.) within the functionally linked habitat.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It is also recommended that a Construction Environmental Management Plan be put in place that would include the proposed mitigation measures in this AA as well as any other specific measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

13 ROA21 Roborough to Littlehempston WTW

13.1 Stage 1 Screening

The Stage 1 Screening identified seven Habitats Sites within the ZoI of ROA21 (Table 13.1). LSE could not be ruled out for two of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 13.1: ROA21 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
South Hams SAC (approximately 2.7km north)	South Dartmoor Woods SAC (approximately 1.3km north-east / 2.2km upstream)
Dartmoor SAC (approximately 4km north-east / 6.5km upstream)	Plymouth Sound & Estuaries SAC (approximately 3.2km west / 5.5km downstream)
	Start Point to Plymouth Sound & Eddystone SAC (approximately 8.1km / 9.9km downstream)
	Lyme Bay and Torbay SAC (approximately 9.1km east / 18.4km downstream)
	Tamar Estuaries Complex SPA (approximately 3.2km west)

Source: Mott MacDonald, 2023

13.1.1 South Dartmoor Woods SAC

There is a hydrological connection between the option and the SAC through the WFD groundwater waterbody IDs GB40802G806700 (Tamar) and GB40802G800700 (Teign, Avon, Dart and Erme). The closest component of the SAC to the option is the Shaugh Prior Woods SSSI, approximately 1.3km north-east at the western end of the proposed pipeline. At this location, the option is within the associated SSSI IRZ, but as the pipeline watercourse crossing (River Plym) is downstream of the SAC, and this SSSI is not a GWDTE, it is not anticipated that there would any significant effects from pollution, if such an event was to occur during construction.

Two other components of the SAC are present within the ZoI, the Hembury Woods SSSI and Holne Woodlands SSSI, approximately 7.5km north of the option at the closest point. Although these SSSI are GWDTE, and therefore sensitive to changes in groundwater levels and/or chemistry, the option is outside of the associated IRZs and therefore no significant effects are anticipated during construction. These component SSSIs are also upstream of the option and so transfer of pollutant from the water crossing on the River Dart is not anticipated.

Due to the distance between the options and the SAC components, no other impact pathways are present during construction.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the South Dartmoor Woods SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not

contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

13.1.2 Start Point to Plymouth Sound & Eddystone SAC

Although there is a hydrological connection between the option and the SAC through the WFD groundwater waterbody IDs GB40802G806700 (Tamar) and GB40802G800700 (Teign, Avon, Dart and Erme), and downstream on the River Yealm, the distances are sufficient that no significant effects are anticipated during construction. Any pollution events, if they were to occur during construction, would not be significant at this distance.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the Start Point to Plymouth Sound & Eddystone SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

13.1.3 Lyme Bay and Torbay SAC

Although there is a hydrological connection between the option and the SAC through the WFD groundwater waterbody ID GB40802G800700 (Teign, Avon, Dart and Erme), and downstream on the River Dart, the distances are sufficient that no significant effects are anticipated during construction. Any pollution events, if they were to occur during construction, would not be significant at this distance.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the Start Point to Plymouth Sound & Eddystone SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

13.1.4 Tamar Estuaries Complex SPA

Although there is a hydrological connection between the option and the SAC through the WFD groundwater waterbody ID GB40802G806700 (Tamar) the distance is sufficient that the option is outside of the SSSI IRZ associated with the SPA (Tamar - Tavy Estuary SSSI) and no significant effects are anticipated during construction. Any pollution events, if they were to occur during construction, would not be significant at this distance.

The habitats surrounding the option are not considered to be functionally linked to the SPA and therefore the qualifying features will not be present and at risk of disturbance effects.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the Tamar Estuaries Complex SPA. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SPA or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

13.1.5 South Hams SAC

Although there is a hydrological connection between the SAC and this option, via the WFD groundwater waterbody IDs GB40802G806700 (Tamar) and GB40802G800700 (Teign, Avon, Dart and Erme), the SAC is not a GWDTE and the option is sufficiently distant that no significant effects are anticipated on the qualifying Annex I habitats within the SAC boundary.

However, as one of the qualifying features of this site is bats, and highly mobile, additional effects on functionally connected areas needs to be assessed to determine potential effects. The eastern section of the proposed pipeline exists within the 4km Sustenance Zone (SZ) around the designated greater horseshoe hibernation roost at Bulkamore Iron Mines SSSI. Within this SZ, proposals which impact upon suitable foraging habitat and commuting routes may have a likely significant effect on the SAC population. As the option bisects agricultural fields, woodlands and watercourses within the sustenance zone, there is the potential for significant effects on the hibernation colony associated with Bulkamore Iron Mines SSSI. Additional disturbance may also arise from additional artificial light required during the construction phase. There is also the potential for pollution events inside the SZ to degrade suitable foraging habitats or commuting routes, displacing bats from preferred foraging areas. The effects of displacement may be temporary or permanent, and lead to changes in the extent, distribution and population size of greater horseshoe bats associated with the SAC.

Some of the pipeline infrastructure is outside of the 4km Sustenance Zone for the greater horseshoe bat but sits within the wider Landscape Connectivity Zone (LCZ). These areas have been mapped around the SAC and key species' roosts outside of the SAC, to help connect the SAC to other populations for the purpose of maintaining genetic diversity and resilience. Option elements/extents which are not within 4km of any designated roosts (the SZ) are not expected to have a significant effect on the SAC population from damage/destruction of foraging habitat or commuting routes.

However, there is a 'Pinch Point' within the option, on the River Dart in Totnes. Pinch Points are known or potential greater horseshoe commuting routes which are significantly restricted, for example due to urban encroachment. Further restriction to Pinch Points could significantly impact the movements of greater horseshoes and potentially have a significant effect on the SAC. This option will not result in any permanent impacts on this Pinch Point, or other suitable commuting corridors such as the River Hems, but there may be temporary impacts and disturbance during the construction phase.

There are no other potential impact pathways during construction, due to the distance between the option and the site (2.7km at the closest point). None of the other qualifying features will be affected by this option during construction.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

Likely significant effects cannot be ruled out on the South Hams SAC during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

13.1.6 Dartmoor SAC

There is a hydrological connection between the SAC and this option, via the WFD groundwater waterbody IDs GB40802G806700 (Tamar) and GB40802G800700 (Teign, Avon, Dart and Erme). Although this SAC has been identified as a GWDTE, this option is outside the SSSI IRZ associated with the SAC (South Dartmoor SSSI) and therefore no significant effects are anticipated within the SAC boundary during construction. This SAC is upstream of surface water

connections and so pollutants will not be transferred into the SAC boundary and damage qualifying Annex I habitats.

However, the pipeline bisects the River Plym, River Yealm, River Erme, River Avon, Bidwell Brook and River Dart. It is possible that these watercourses are functionally linked habitat used by migrating Atlantic salmon and otter outside of the SAC. Where the pipeline crosses, direct and indirect effects may displace these species from preferred foraging commuting, or migration routes.

Otter populations associated with the SAC may forage on the rivers on the bisected rivers, and also use them as commuting routes to the wider landscape. Any pollution events during construction may reduce water quality and prey availability and displace otter from preferred foraging areas. Loss of bankside habitats during pipeline installation may result in the loss of resting sites, in addition to creating additional sedimentation and siltation downstream; this could reduce the suitability for both otter and their prey.

Atlantic salmon may migrate into the Dartmoor SAC through the Rivers Plym, Erme, Avon and Yealm. It is possible that any pollution events which affect the river could have a significant effect on Atlantic salmon, changing water quality downstream of the option. As mentioned above regarding otter, loss of bankside habitat may result in additional sedimentation which could affect salmon. Maintaining good water quality is stated as a target for supporting salmon populations in the conservation objectives supplementary advice for Dartmoor SAC. Reduced water quality make degrade watercourses to a point where habitat is no longer suitable for Atlantic salmon. This would essentially create a barrier to migration, effectively providing barriers to further upstream movements to within the SAC boundary. The future viability of populations may be jeopardised as species are forced into sub-optimal areas to breed and/or spawn, changing their distribution and extent within functionally linked habitats outside of the SAC.

During construction there may be indirect effects to qualifying species through disturbance; noise, visual and artificial light are all sources of disturbance which could impact otter and Atlantic salmon. Disturbing effects can result in changes to behaviours, increased energy expenditure due to fleeing, abandonment of young (otter only), and desertion of supporting habitat. Disturbance to qualifying species when foraging may jeopardise adult fitness, survival and breeding success. As a European Protected Species, it is an offence to disturb an otter resting place or breeding site (natal den: subterranean dens/holts and above ground/couches). Resting places are typically located in dense bank vegetation and areas of reed. Breeding sites are located in hollow tree trunks and piles of timber[35]. Effects of displacement may be temporary or long-lasting and may result in redistribution within or from a site.

Due to the proximity of works to the rivers, the effects of air pollution during construction may also contribute to habitat damage and degradation. The functionally linked habitat for otter is considered sensitive to changes in air quality, including broadleaved woodland. Based on publicly available data from 2020 (2019 – 2021 three-year average)[36], nitrogen deposition within functionally linked habitats is between 10.2 – 10.4kg/ ha/ year on average. Both nitrogen oxides and sulphur dioxide are below the critical level with nitrogen oxides at 4.4µg m^{-3} with a critical level of 30µg m^{-3} and sulphur dioxides at 0.5µg m^{-3} with a critical level of 20µg m^{-3}. Therefore, it is not anticipated that construction works will have an adverse effect on air quality in relation to the functionally linked habitat critical levels.

[35] Kruuk, H. 2006. Otters: ecology, behaviour and conservation: ecology, behaviour and conservation, OUP Oxford.

[36] Air Pollution Information System (2021). Site Relevant Critical Loads and Source Attribution (APIS GIS map tool). Accessed from: APIS app | Air Pollution Information System

There are no other potential impact pathways during construction, due to the distance between the option and the site (3.9km at the closest point). None of the other qualifying features will be affected by this option during construction. The qualifying species of the site, Southern damselfly, has a limited dispersal distance, rarely travelling distances greater than 500m.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

Likely significant effects cannot be ruled out on the Dartmoor SAC during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

13.1.7 Plymouth Sound & Estuaries SAC

Although there is a hydrological connection between the option and the SAC through the WFD groundwater waterbody ID GB40802G806700 (Tamar) and downstream on the River Yealm and River Plym, the distances are sufficient that the option is outside of the SSSI IRZ associated with this SAC (Tamar - Tavy Estuary SSSI, Yealm Estuary SSSI and Plymouth Sound Shores and Cliffs SSSI) and no significant effects are anticipated during construction.

The River Plym and River Yealm are not known to be migration routes for allis shad *Alosa alosa* used for spawning, and so it is not anticipated that any functionally linked habitat outside of the SAC boundary will be significantly affected.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the Plymouth Sound & Estuaries SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

13.2 Appropriate Assessment

13.2.1 Scope

The following sites were assessed at Stage 2 AA:

- South Hams SAC (approximately 2.7km north)
- Dartmoor SAC (approximately 4km north-east / 6.5km upstream)

An assessment of each potential impact on the integrity of the Habitats Sites is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 13.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

13.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

It is assumed that otters which are part of the Dartmoor SAC population regularly use the main rivers which are bisected by the pipeline alignment downstream of the SAC, and therefore may be significantly affected by the construction of the option in this area.

It is also assumed that high densities of the Atlantic salmon population associated with the Dartmoor SAC use the bisected rivers as migration routes, Potential adverse effects on integrity of Habitats Sites from option ROA21.

All suitable foraging and commuting habitats for greater horseshoe bats which are bisected by the pipeline alignment, or within 50m of, are assumed to be lost during construction. This is likely to have a significant effect on the species within the SZ and therefore mitigation is required.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option ROA21, there was no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. All waterbodies were screened out for significant effects at the Level 1 assessment. The WFD assessment concluded the confidence in the screening outcome is low, and so temporary effects of pollution transferred through the surface water during construction have been assessed as a precautionary approach to the HRA.

Table 13.2: Potential adverse effects on integrity of Habitats Sites from option ROA21

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
South Hams SAC (approximately 2.7km north)	Greater horseshoe bat	This option may have the following temporary or permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of functionally linked watercourse and terrestrial habitats, such as woodland and grasslands ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off. This could lead to increased silt deposition and smothering in suitable foraging habitats, such as woodland streams. ● Physical loss/damage – significant localised habitat loss and/or degradation leading to a reduction in the extent and/or distribution of foraging habitat and/or commuting routes within the Sustenance Zone. ● Non-physical disturbance – visual, noise and artificial light disturbance close to foraging habitats and commuting routes during construction may result in changes to feeding behaviours. Bats may be foraging or commuting along the main rivers (including the River Dart), wooded streams, woodland edges or hedgerows and therefore disturbance can change regular behaviours and use of preferred areas. ● Biological disturbance - increased energy expenditure by qualifying features in response to construction related noise and visual disturbance, possibly resulting in displacement from preferred foraging habitats or commuting routes. A reduction in available functionally linked habitat availability for greater horseshoe bat. Both can subsequently result in changes in distribution of populations associated with the SAC, as a result of the above impact pathways.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Specific mitigation to reduce increased sedimentation and silt deposition include[37]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide and suitable functionally linked habitats (such as grassland and woodland), where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourses and woodlands to limit impact pathways into these habitats. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the watercourse bed. This will reduce indirect effects of pollution downstream	No adverse effects

[37] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
		The effects of toxic contamination, non-toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the nature of the option (narrow working corridors and short construction periods). No adverse impacts are identified during operation.	within the watercourses. This applies to the River Dart crossing at Totnes (Pinch Point), and smaller wooded streams within the Sustenance Zone. ● Retention of other foraging and commuting habitats such as grassland and hedgerows, where possible. Limit severance of linear features which may be commuting routes, such as hedgerows, to gaps which are no more than 10m wide. ● Replanting of any lost vegetation, including grassland used for foraging and hedgerows/other linear features used for commuting, with appropriate native species (or translocation of previously removed vegetation) to ensure any losses are temporary only. ● Sensitive timing of construction works to avoid periods of highest bat activity, i.e. daytime working only. This will alleviate the need for artificial lighting which could otherwise cause disturbance. ● Best practice such as 'Guidance Notes for the Reduction of Obtrusive Light' (Institute of Lighting Professionals, 2011) to avoid significant effects due to increased light (if works are programmed at night) ● Avoidance of buildings and structures which may be used as roosts by horseshoe bats. Provide a buffer of at least 50m from such features to avoid disturbance through noise and vibration. ● If a confirmed roost is directly or indirectly impacted (i.e. through loss/damage, or noise/vibration/light disturbance), then a Natural England protected species licence will be required before works start, which will detail	

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			specific measures to avoid offences and compensation measures to replace the lost roost. The development of a Construction and Environmental Management Plan which will include all the above proposed mitigation measures and any further measures identified at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
	All qualifying Annex I habitats	There are no impact pathways identified for this qualifying feature. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.
Dartmoor SAC (approximately 4km north-east / 6.5km upstream)	Otter	This option may have the following temporary or permanent impacts on the Habitats Site during the construction phase: ● Toxic contamination – pollution of functionally linked watercourses outside of the Habitats Site boundary, reducing water quality and prey availability of otters. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off. This could lead to increased silt deposition and smothering in suitable foraging habitats, such as the River Dart. ● Physical loss/damage – significant localised habitat loss and/or degradation leading to a reduction in the extent and/or distribution potential resting site locations at or near main watercourses. ● Non-physical disturbance – visual, noise, vibration and artificial light disturbance close to foraging habitats and resting sites during construction may result in changes to	The following measures will be implemented to avoid or reduce adverse impacts: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Specific mitigation to reduce increased sedimentation and silt deposition include[38]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and	No adverse effects

[38] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
		feeding and breeding behaviours. Otters may be foraging within the River Dart or other nearby watercourses and therefore disturbance can change regular behaviours, the use of preferred areas and breeding success. ● Biological disturbance - increased energy expenditure by qualifying features in response to construction related disturbance, possibly resulting in displacement from preferred foraging habitats, breeding sites or commuting routes and ultimately a reduction in breeding success or adult survival. This can subsequently result in changes in distribution of populations associated with the SAC, as a result of the above impact pathways. The effects of toxic contamination, non-toxic contamination and physical loss/damage of habitat could be permanent impacts but are likely to be localised due to the nature of the option (narrow working corridors and short construction periods). No adverse impacts are identified during operation.	– Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide and suitable habitats for resting sites (such as scrub and woodland), where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce indirect effects of pollution downstream within the main rivers. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include[39]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Sensitive timing of construction works to avoid the periods of greatest otter activity, i.e. no night-time working ● Best practice such as ‘Guidance Notes for the Reduction of Obtrusive Light’ (Institute of Lighting Professionals, 2011) to avoid	

[39] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			significant effects due to increased light (if works are programmed at night) ● Retain bankside habitat cover and other suitable adjacent habitats where possible. ● Pre-commencement otter survey to ensure that no breeding or resting sites are present within the Zone of Influence (ZoI) of the works. ● Potential resting sites should be monitored using cameras (requires Natural England licence). A 30m protection zone around confirmed resting sites is required during construction. This distance is extended to 150m for confirmed breeding sites. ● If holts require closure and destruction to facilitate construction, artificial replacements will be required on the same watercourse away from the works area. These must be in-situ before construction starts. This work will require a Natural England licence. The development of a Construction and Environmental Management Plan which will include all the above proposed mitigation measures and any further measures identified at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
	Atlantic salmon	This option may have the following temporary or permanent impacts on the Habitats Site during the construction phase: ● Toxic contamination – pollution of functionally linked watercourses outside of the Habitats Site boundary, reducing water quality and habitat suitability for salmon. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-	The following measures will be implemented to avoid or reduce adverse impacts: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites).	No adverse effects

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
		off. This could lead to increased silt deposition and smothering in suitable migration routes, such as the River Dart. ● Physical loss/damage – significant localised habitat degradation leading to a reduction in the extent of suitable habitat within main watercourses. ● Non-physical disturbance – visual, noise, vibration and artificial light disturbance close to functionally linked watercourses during construction may result in changes to feeding and migration behaviours. Disturbance can change regular behaviours, the use of preferred areas and migration success. ● Biological disturbance – changes to habitat availability from the above impact pathways, resulting in a reduction in future breeding success or adult survival. This can subsequently result in changes in distribution of populations associated with the SAC. The effects of toxic contamination, non-toxic contamination and physical loss/damage of habitat could be permanent impacts but are likely to be localised due to the nature of the option (narrow working corridors and short construction periods). No adverse impacts are identified during operation.	● Specific mitigation to reduce increased sedimentation and silt deposition include[40]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide, where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce indirect effects of pollution downstream within the main rivers. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include[41]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and	

[40] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

[41] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			– Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Sensitive timing of construction works to avoid key spawning and upstream migration of salmon (November to February inclusive) ● Best practice such as 'Guidance Notes for the Reduction of Obtrusive Light' (Institute of Lighting Professionals, 2011) to avoid significant effects due to increased light (if works are programmed at night) ● Maintain upstream and downstream passage for all fish, with no physical barriers during construction. The development of a Construction and Environmental Management Plan which will include all the above proposed mitigation measures and any further measures identified at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
	All qualifying Annex I habitats Southern damselfly	There are no impact pathways identified for this qualifying feature. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.

Source: Mott MacDonald, 2023

13.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on any of the Habitats Sites during the construction phase, provided the recommended mitigation measures, are implemented at the project level. Mitigation which may be progressed at the project stage could include the use of best-practice pollution and sediment control measures, surface watercourse and woodland habitat avoidance via directional drilling, habitat retention and replacement (if necessary), sensitive timings of works and, if required, Natural England licences for otter and/or greater horseshoe bats.

No impact pathways during the operational phase of the option have been identified on Habitats Sites or their qualifying features.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Evaluation and modelling of emissions from traffic (heavy goods vehicles), plant and non-road mobile machinery to determine if heavy goods vehicle restrictions are required during construction works within close proximity to functionally linked habitats for qualifying features of the South Hams SAC (greater horseshoe bat) and Dartmoor SAC (otter and Atlantic salmon).
- Desk based noise assessment to determine extent of the ZoI once more information is available on construction methodology.
- A desk-based hydro-geological assessment is required when more information is available to ensure that the pipeline installation proposed does not cause subsidence of the riverbed on the River Plym, River Yealm, River Erme, River Avon, Bidwell Brook and River Dart.
- Bat activity surveys are recommended to determine the presence or likely absence of greater horseshoe bats surrounding the proposed pipeline construction within the SZ associated with Bulkamore Iron Mine SSSI, and how this species utilises the habitats present surrounding the option.
- A detailed review of the baseline ecological data for bats, otter and fish to inform the requirement for additional monitoring and to determine more targeted mitigation measures. This is likely to include otter and fish surveys on bisected rivers.
- River condition assessments to assess the condition of the River Plym, River Yealm, River Erme, River Avon, Bidwell Brook and River Dart prior to construction, to determine the location of qualifying features and supporting habitat within the functionally linked habitat. This will allow estimation of construction impacts and potential degradation in site condition.
- Adapted river habitat surveys of the River Plym, River Yealm, River Erme, River Avon, Bidwell Brook and River Dart to determine if suitable spawning habitat is present for Atlantic salmon, (mapping of silt beds, gravel, riffles, glides, runs, shelter etc.) within the functionally linked habitat.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It is also recommended that a Construction Environmental Management Plan be put in place that would include the proposed mitigation measures in this AA as well as any other specific measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

14 WIM2 Sidford borehole commissioning

14.1 Stage 1 Screening

The Stage 1 Screening identified five Habitats Sites within the ZoI of WIM2 (Table 14.1). LSE have been ruled out for all of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 14.1: WIM2 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
	Sidmouth to West Bay SAC (approximately 2.6km south)
	East Devon Pebblebed Heaths SAC (approximately 6.1km west)
	East Devon Heaths SPA (approximately 6.1km west)
	Beer Quarry & Caves SAC (approximately 7.7km east)
	Lyme Bay and Torbay SAC (approximately 8.1km south-east)

Source: Mott MacDonald Limited, 2023

14.1.1 Sidmouth to West Bay SAC

There is a hydrological connection between the site and the option, via the WFD groundwater body GB40802G802800 (Sidmouth-Honiton, Mercia Mudstone). However, this option lies outside the SSSI IRZ associated with this SAC (Sidmouth to Beer Coast SSSI) and is therefore sufficiently distant that no significant effects are anticipated during construction.

Whilst there may be an interaction between the qualifying Annex I habitat 'annual vegetation of drift lines' and surface water from the River Sid, this habitat is not likely to suffer from landward water quality issues and any flow will sink below beach level quickly, as detailed within the conservation objectives supplementary advice for this SAC[42]. The other qualifying features are habitats on the top of cliffs, which do not interact with the surface water and will therefore not be affected by any reduction in water quality within the River Sid during construction, as a result of discharge activities associated with the new borehole construction.

During operation, it is possible that the increased abstraction reduced the groundwater level. No significant effects are anticipated on the SAC, despite it being a GWDTE, due to the distance from the option. This is supported by the conclusion of the WFD Level 2 assessment. Reductions in groundwater level may result in changes to base flow of the River Sid, impacted river health and quality. However, this reduction in flow is not anticipated to have a significant effect on the SAC or its qualifying features, as per the above regarding their locations and resilience to landward water quality.

14.1.2 East Devon Pebblebed Heaths SAC

This option is outside of SSSI IRZ associated with the SAC (East Devon Pebblebed Heaths SSSI) and therefore is sufficiently distant from the proposed works (approximately 6.1km) that

[42] Natural England (2019). European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring site features Sidmouth to West Bay Special Area of Conservation (SAC) Site code: UK0019864. Available at: European Site Conservation Objectives for Sidmouth to West Bay SAC - UK0019864 (naturalengland.org.uk).

no significant effects are anticipated during construction. There is no hydrological connectivity between the SAC and this option, so any impacts on the groundwater catchment during operation will have no effect.

14.1.3 East Devon Heaths SPA

This option is outside of SSSI IRZ associated with the SAC (East Devon Pebblebed Heaths SSSI) and therefore is sufficiently distant from the proposed works (approximately 6.1km) that no significant effects are anticipated during construction. There is no hydrological connectivity between the SAC and this option, so any impacts on the groundwater catchment during operation will have no effect.

The works area is small and in existing hardstanding, which means that there will be no loss of functionally linked habitat for qualifying features outside the SPA boundary. The habitat surrounding the proposed works area is not suitable for the qualifying species of the site to use for foraging and is outside of the foraging radius cited within the supplementary advice[43].

14.1.4 Beer Quarry & Caves SAC

This site is sufficiently distant from the proposed works (approximately 7.7km) and not hydrologically connected to the option footprint, meaning that there are unlikely to be any significant effects within the SAC boundary during construction or operation.

However, as the qualifying features of this site are bats, and highly mobile, additional effects on functionally connected habitat needs to be assessed to determine potential effects. This option lies within the consultation area of this site, as defined in the Beer Quarry & Caves SAC HRA guidance[44]. This option lies outside the SZ but within the LCZ of all qualifying features; greater horseshoe, lesser horseshoe *Rhinolophus hipposideros* and Bechstein's bat *Myotis bechsteinii*. These areas have been mapped around the SAC and key species' roosts outside of the SAC, to help connect the SAC to other populations for the purpose of maintaining genetic diversity and resilience.

Developments outside of the SZ but within the LCZ for each qualifying feature are only likely to have significant effects if they result in landscape level changes to suitable bat habitats. The construction footprint of this option is confined to the existing SWW site and surrounding habitats; an area of hardstanding and arable fields will be developed, which will not result in the loss or disturbance to any suitable commuting and foraging habitat for qualifying features. Reduced flow on the River Sid is therefore not considered to have a landscape level effect, and so significant effects on any of the qualifying features of the SAC are not anticipated during construction or operation.

14.1.5 Lyme Bay and Torbay SAC

This site is sufficiently distant from the proposed works (approximately 8.1km) and not hydrologically connected to the option footprint. As such, there are unlikely to be any effects during construction or operation of the option. There is no SSSI IRZ associated with this SAC for reference.

It is considered that no likely significant effects are anticipated on any of the five Habitats Sites. On the basis of the screening assessment, it is concluded that the proposed option will have no

[43] Natural England (2019). East Devon Heaths SPA Conservation Objective Supplementary Advice [online] available at: European Site Conservation Objectives for East Devon Heaths SPA - UK9010121 (naturalengland.org.uk)

[44] Devon County Council, East Devon District Council and East Devon AONB (2023). Beer Quarry & Caves SAC Habitats Regulations Assessment Guidance [online] available at: 2a-appendix-1-bat-consultation-zones-sac-guidance.pdf (eastdevon.gov.uk)

appreciable effect on the Habitats Sites or their qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, these Habitats Sites are not considered further.

15 WIM5 Indirect potable reuse – stream support for Dotton WTW

15.1 Stage 1 Screening

The Stage 1 Screening identified three Habitats Sites within the ZoI of WIM5 (Table 15.1). LSE could not be ruled out for three of these sites.

Information on the qualifying features of the assessed Habitats Sites is provided in Appendix B**.**

Table 15.1: WIM5 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
East Devon Pebblebed Heaths SAC (approximately 1.8km north-west)	Sidmouth to West Bay SAC (approximately 4.6km east)
East Devon Heaths SPA (approximately 1.8km north-west)	

Source: Mott MacDonald Limited, 2023

15.1.1 East Devon Pebblebed Heaths SAC

This SAC is hydrologically connected to the option via the WFD groundwater waterbody ID GB40801G801900 (Otter Valley). The SAC has been identified as a GWDTE and therefore ecologically sensitive to changes in ground water levels and/or quality. However, the option is outside of the SSSI IRZ associated with the SAC and, considering the minor construction works involved for upgrading the borehole, there are not considered to be any significant effects on the SAC from construction-related pollution, if such an event was to occur.

The distance between the option and the SAC is sufficient (1.8km) that there are no other impact pathways during construction.

During operation, increased abstraction from borehole 5 within the Otter Valley groundwater body may reduce the overall water availability within the catchment. In the absence of detailed hydrogeological assessment, a precautionary approach is taken and the potential for significant effects on the SAC is concluded. A reduction is groundwater level may result in the degradation of qualifying Annex I habitats and habitats which support Southern damselfly. This could reduce the overall extent and distribution within the SAC boundary. Hydrological changes have been identified as threats to the SAC within the site improvement plan (SIP)[45]. No other impact pathways are present during operation.

Likely significant effects cannot be ruled out on the East Devon Pebblebed Heaths SAC during operation. As such this SAC has been progressed to Stage 2 Appropriate Assessment.

15.1.2 East Devon Heaths SPA

The hydrological connection between this option and the SPA is the same as described for the East Devon Pebblebed Heaths SAC, as these sites' boundaries are identical. Although this SPA has been identified as a GWDTE, as the option is outside of the SSSI IRZ associated with the SAC and, considering the minor construction works involved for upgrading the borehole, there

[45] Natural England (2014). Site Improvement Plan: East Devon Heaths (SIP070). Available at: Site Improvement Plan: East Devon Heaths - SIP070 (naturalengland.org.uk)

are not considered to be any significant effects on the SPA from construction-related pollution, if such an event was to occur.

No other impact pathways have been identified during construction. The minor works will take place within the existing Dotton WTW, which is not considered to be within or near functionally linked habitat for Dartford warbler or nightjar outside of the SPA boundary. As such, no effects from construction-related disturbance on breeding qualifying features are anticipated.

During operation, increased abstraction from borehole 5 within the Otter Valley groundwater body may reduce the overall water availability within the catchment. In the absence of detailed hydrogeological assessment, a precautionary approach is taken and the potential for significant effects on the SPA is concluded. A reduction is groundwater level may result in the degradation of habitats which support the qualifying features. This could reduce the overall extent, distribution and population size within the SPA boundary. Changes to habitat availability may result in displacement of qualifying features within or from the site and affect future population viability. Hydrological changes have been identified as threats to the supporting habitats within the site improvement plan (SIP), although are not expected to directly affect the qualifying features[46]. No other impact pathways are present during operation.

Likely significant effects cannot be ruled out on the East Devon Heaths SPA during operation. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

15.1.3 Sidmouth to West Bay SAC

There is no hydrological connectivity between this option and the SAC. The option is outside of the SSSI IRZ associated with the SAC and therefore no significant effects are anticipated during the minor construction works.

As there is no hydrological connectivity, no significant effects are anticipated during operation; the increased abstraction from the Otter Valley groundwater waterbody will have no effects on this SAC.

It is considered that no likely significant effects are anticipated on the Sidmouth to West Bay SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

15.2 Appropriate Assessment

15.2.1 Scope

The following site was assessed at Stage 2 AA:

- East Devon Pebblebed Heaths SAC (approximately 1.8km north-west)
- East Devon Heaths SPA (approximately 1.8km north-west)

An assessment of each potential impact on the integrity of the designated site is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 15.2 below.

[46] Natural England (2019). European Site Conservation Objectives for East Devon Heaths SPA (UK9010121). Available at: European Site Conservation Objectives for East Devon Heaths SPA - UK9010121 (naturalengland.org.uk)

15.2.2 Assumptions and mitigation measures

Based on the current level of information a number of assumptions have been made, relating to principles, which will be followed during option development at the project level.

It is assumed that following the necessary upgrades to Dotton borehole 5, this option also involves the additional abstraction of 2.5Ml/dMl/d from the groundwater source. This also assumes that there would be no issues in obtaining a licence for this activity, and so this constitutes the operational phase.

It is also assumed that all upgrade works to the borehole will be contained within the Dotton WTW footprint, and so there will be no additional habitat loss and/or fragmentation associated with these works. The habitats surrounding the borehole and Dotton WTW are assumed to be sub-optimal for supporting qualifying features of the East Devon Heaths SPA and therefore construction-related disturbance to functionally linked habitat is not considered.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option WIM5 and the 'Otter Valley', that there would be no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. The WFD assessment concluded the confidence in the screening outcome is low, and the extent of the influence of abstraction is unclear. Therefore, a precautionary approach is taken for this assessment and additional studies are required before a conclusion is possible. Any water transfer from the Otter Valley must be incorporated into the RBMP and the implications of future design changes on the conservation objectives of the East Devon Pebblebed Heaths SAC and East Devon Heaths SPA should be assessed in accordance with the 2017 Regulations.

Table 15.2 Potential adverse effects on integrity of Habitats Sites from option WIM5

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
East Devon Pebblebed Heaths SAC (approximately 1.8km north-west)	Northern Atlantic wet heaths European dry heaths	This option may have the following permanent effects on the qualifying Annex I habitats during the operation phase: ● Water table availability – a reduction in water level within the SAC due to the increased abstraction. This may affect the groundwater resulting in degradation of qualifying habitats. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in qualifying habitats' extent and/or distribution from the impact pathways above. The identified effects have the potential to reduce the distribution and extent of qualifying Annex I habitats.	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrologeological modelling of the proposed abstraction the Otter Valley groundwater body. The operational limits of the abstraction and transfer from the Otter Valley that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.
	Southern damselfly	In addition to the above, this option may have the following additional permanent effects on Southern damselfly during operation: ● Biological disturbance - changes to habitat availability from the above impact pathways, leading to the displacement of Southern damselfly within the SAC and jeopardising future population viability. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		No adverse effects.
East Devon Heaths SPA (approximately 1.8km north-west)	Dartford warbler Nightjar	This option may have the following permanent effects on the qualifying features during the operation phase: ● Water table availability – a reduction in water level within the SPA and functionally linked habitats due to the increased abstraction. This may affect the groundwater resulting in	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrologeological modelling of the proposed abstraction the Otter Valley groundwater body. The operational limits of the abstraction and transfer from the Otter Valley that will be imposed	No adverse effects

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		degradation of supporting habitats within and outside the SPA. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in qualifying habitats' extent and/or distribution from the impact pathways above. ● Biological disturbance - changes to habitat availability from the above impact pathways, leading to the displacement of qualifying features within the SPA and functionally linked habitat, jeopardising breeding success, adult survival and future population viability. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.	by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	

Source: Mott MacDonald Limited, 2023

15.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effect on site integrity can be concluded for option WIM5 during operation, on the understanding that further research identified in the conclusion of this Appropriate Assessment, and within the WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The assessment assumes a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydrogeological studies on the local groundwater interactions to identify whether the changes in the water levels within the Otter Valley from the new abstraction would have an adverse effect on the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites within the ZoI, and their qualifying features.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

16 WIM11 Couchill Springs, Seaton

16.1.1 Stage 1 Screening

The Stage 1 Screening identified four Habitats Sites within the ZoI of WIM11 (Table 16.1). LSE could not be ruled out for three of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 16.1: WIM11 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
Lyme Bay and Torbay SAC (approximately 850m south / 1.1km downstream)	River Axe SAC (approximately 3.7km north-east)
Sidmouth to West Bay SAC (approximately 780m south / 1km downstream)	
Beer Quarry & Caves SAC (approximately 430m west)	

Source: Mott MacDonald Limited, 2023

16.1.2 Lyme Bay and Torbay SAC

There is a hydrological connection between the site and the option, via the Beer Brook (approximately 1.1km downstream). Any pollution events may be transferred to the site through the surface water and affect qualifying features, through damage or degradation to Annex I habitats. Because the qualifying features are marine elements and not directly connected via the groundwater catchment, no significant effects are anticipated through this pathway.

Due to the distance between the option and the SAC, no other impact pathways are present during construction.

There are no impact pathways between the option and any of the qualifying features during operation.

Likely significant effects cannot be ruled out on the Lyme Bay and Torbay SAC during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

16.1.3 Sidmouth to West Bay SAC

There is a hydrological connection between the site and the option, via the Beer Brook (approximately 1km downstream) and the WFD groundwater waterbody ID GB40801G802400 (East Devon - Greensand). This option is within the SSSI IRZ associated with the SAC. The underpinning Sidmouth to Beer Coast SSSI has been identified as a GWDTE and is therefore ecologically sensitive to changes in groundwater levels and chemistry. Any pollution events may be transferred to the site through these hydrological connections and affect qualifying features, through damage or degradation to Annex I habitats. This impact pathway is not present for other components of the SAC, the West Dorset Coast SSSI and Axmouth to Lyme Regis Undercliffs SSSI. Although the latter is approximately 2.5km east of the option, there is no hydrological connectivity.

Due to the distance between the option and the SAC, no other impact pathways are present during construction.

There are no impact pathways between the option and any of the qualifying features during operation.

Likely significant effects cannot be ruled out on the Sidmouth to West Bay SAC during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

16.1.4 Beer Quarry and Caves SAC

There is a hydrological connection between the site and the option, via the WFD groundwater waterbody ID GB40801G802400 (East Devon - Greensand). This option is within the SSSI IRZ associated with this SAC (Beer Quarry and Caves SSSI). There are not expected to any significant effects from pollution events within the site itself, as the habitats present are caves and unlikely to be degraded. However, functionally linked habitats used by qualifying features outside of the SAC boundary, such as watercourses, woodland and grassland, may be damaged or degraded by any pollution events, if they were to occur during construction.

As the qualifying features of this site are bats, and highly mobile, additional effects on functionally linked habitat needs to be assessed to determine potential effects. This option lies within the consultation area of this site, as defined in the Beer Quarry and Caves SAC HRA guidance[47]. This option lies within the SZ for greater horseshoe, lesser horseshoe and Bechstein's bat, and the Hibernation Sustenance Zone (HSZ) for both horseshoe species[48]. These areas have been mapped around the SAC and key species' roosts outside of the SAC, to help connect the SAC to other populations for the purpose of maintaining genetic diversity and resilience.

During construction, there may be direct impacts to important roosting habitat used by Bechstein's bat, a species which predominantly roosts within mature trees during both the summer and hibernation periods. Direct loss of, damage to, or disturbance near, mature trees in hedgerows or on the edge of woodlands during construction could result in direct mortality of Bechstein's bats and a reduction in the availability of suitable breeding or hibernating habitat. Horseshoe bat species do not roost in trees, choosing buildings or structures, of which there are none within the immediate surrounds of the option.

There may also be loss or severance of optimal foraging and commuting habitats for all three qualifying bat species during construction. Although only expected to be temporary due to the nature of the option, severance of hedgerows and/or damage to grassland, pasture and woodland edge may have significant effects on the qualifying features' populations within the critical SZs. Close proximity of construction activities to optimal habitats such as woodland, hedgerows and riparian corridors may also result in disturbance to roosting (Bechstein's only), foraging and commuting habitats. Any night works may result in additional disturbance to foraging and commuting bats through the use of artificial lighting. Disturbance to qualifying species may jeopardise adult fitness, survival rates and future breeding success. All of these effects may result in displacement of qualifying features from the SZ. Effects of displacement may be temporary or long-lasting and may result in redistribution within or from a site.

The functionally linked habitat for these qualifying features is considered sensitive to changes in air quality, including broadleaved woodland and lowland calcareous grassland. Based on

[47] East Devon District Council, Natural England, Bat Conservation trust and East Devon AONB Partnership (2022). Beer Quarry & Caves Special Area of Conservation (SAC). Habitats Regulations Assessment Guidance October 2022 [online] available at: beer-quarry-and-caves-sac-hra-guidance.pdf (eastdevon.gov.uk)

[48] Devon County Council (2023). Devon County Council Environmental Viewer [online] available at: Devon County Council Environment Viewer

publicly available data from 2020 (2019 – 2021 three-year average)[49], nitrogen deposition within functionally linked habitats is between 8.1 - 8.6kg/ ha/ year on average. Both nitrogen oxides and sulphur dioxide are below the critical level with nitrogen oxides at 5µg m^{-3} with a critical level of 30µg m^{-3} and sulphur dioxides at 0.7µg m^{-3} with a critical level of 20µg m^{-3}. Therefore, it is not anticipated that construction works will have an adverse effect on air quality in relation to the functionally linked habitat critical levels.

There are no impact pathways during operation and therefore no significant effects are anticipated.

Likely significant effects cannot be ruled out on the Beer Quarry and Caves SAC during the construction stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

16.1.5 River Axe SAC

This option is outside the SSSI IRZ associated with the SAC (River Axe SSSI) and is therefore sufficiently distant that no significant effects are anticipated during construction. There is no hydrological connectivity between he option and the SAC.

There are no impact pathways during operation and therefore no significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the River Axe SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

16.2 Appropriate Assessment

16.2.1 Scope

The following two sites were assessed at Stage 2 AA:

- Lyme Bay and Torbay SAC (approximately 850m south / 1.1km downstream)
- Sidmouth to West Bay SAC (approximately 780m south / 1km downstream)
- Beer Quarry and Caves SAC (approximately 430m west)

An assessment of each potential impact on the integrity of the designated sites is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 16.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

16.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

[49] Air Pollution Information System (2021). Site Relevant Critical Loads and Source Attribution (APIS GIS map tool). Accessed from: APIS app | Air Pollution Information System

These measures are defined as industry-wide best practice measures to address common risks in the construction and development sectors and thus are proven to reduce the risk of the identified effects in so far as is reasonably possible.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option WIM11, there was no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. All waterbodies were screened out for significant effects at the Level 1 assessment. The WFD assessment concluded the confidence in the screening outcome is low, and so temporary effects of pollution transferred through the surface water during construction have been assessed as a precautionary approach to the HRA.

Table 16.2: Potential adverse effects on integrity of Habitats Sites from option WIM11

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
Lyme Bay and Torbay SAC (approximately 850m south / 1.1km downstream)	All	This option may have the following permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the surface water, Beer Brook and another unnamed watercourse, which could be transferred downstream to within the SAC and degrade qualifying features. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off. This could lead to increased silt deposition and smothering downstream within the SAC. ● Physical loss and/or damage – significant localised habitat degradation leading to a reduction in the extent and/or distribution of qualifying Annex I habitats and shore dock. ● Biological disturbance – introduction of INNS to the SAC. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species No adverse effects are identified during operation.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide, where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce indirect effects of pollution downstream within the SAC. ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include[50]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. – Planning silt screening around the area of works to limit the movement and redeposition of material.	No adverse effects

[50] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			– Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
Sidmouth to West Bay SAC (approximately 780m south / 1km downstream)	All	This option may have the following permanent effects on the Habitats Site during the construction phase: ● Toxic contamination – pollution of the surface water, Beer Brook and another unnamed watercourse, which could be transferred downstream to within the SAC and degrade qualifying features. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off. This could lead to increased silt deposition and smothering downstream within the SAC. ● Physical loss/damage – significant localised habitat degradation leading to a reduction in the extent and/or distribution of qualifying Annex I habitats and shore dock. ● Biological disturbance – introduction of INNS to the SAC. The effects of toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the distance of the option from the Habitats Site. The identified effects have the potential to reduce the distribution and extent of qualifying features. No adverse effects are identified during operation.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide, where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourse to limit impact pathways into the watercourse. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the riverbed. This will reduce indirect effects of pollution downstream within the SAC.	No adverse effects

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			• Specific mitigation to reduce increased sedimentation and silt deposition downstream include[51]: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. – Planning silt screening around the area of works to limit the movement and redeposition of material. – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
Beer Quarry and Caves SAC (approximately 430m west)	All	This option may have the following permanent effects on the Habitats Site during the construction phase: • Toxic contamination – pollution of functionally linked watercourse and terrestrial habitats, such as woodland and grasslands. • Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off. This could lead to increased silt deposition and smothering in suitable foraging habitats, such as woodland streams. • Physical loss/damage – significant localised habitat loss and/or degradation leading to a reduction in the extent	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: • CIRIA C741 Environmental good practice on site guide. • Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). • Biosecurity measures to ensure appropriate removal and/or management control of INNS at source.	No adverse effects

[51] Institute of Air Quality Management IAQM (2017) Guidance on the Assessment of Dust from Demolition and Construction v1.1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
		and/or distribution of roosts, foraging habitat and/or commuting routes within the Sustenance Zone. ● Non-physical disturbance – visual, noise and artificial light disturbance close to foraging habitats and commuting routes during construction may result in changes to feeding behaviours. Bats may be foraging or commuting along wooded streams, woodland edges or hedgerows and therefore disturbance can change regular behaviours and use of preferred areas. ● Biological disturbance - increased energy expenditure by qualifying features in response to construction related noise and visual disturbance, possibly resulting in displacement from preferred foraging habitats or commuting routes. A reduction in available functionally linked habitat availability for all qualifying bat species. Direct mortality of Bechstein's bats if tree roosts are lost or damaged during construction. These effects can subsequently result in changes in distribution of populations associated with the SAC, as a result of the above impact pathways. Introduction of INNS to functionally linked habitats. The effects of toxic contamination, non-toxic contamination and physical loss/damage of habitat could be permanent but are likely to be localised due to the nature of the option (narrow working corridors and short construction periods). The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species. No adverse effects are identified during operation.	● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide and suitable functionally linked habitats (such as grassland and woodland), where proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourses and woodlands to limit impact pathways into these habitats. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the watercourse bed. This will reduce indirect effects of pollution downstream within the watercourses. This applies to the wooded streams within the Sustenance Zone at either end of the option. ● Retention of other foraging and commuting habitats such as grassland and hedgerows, where possible. Limit severance of linear features which may be commuting routes, such as hedgerows, to gaps which are no more than 10m wide. ● Replanting of any lost vegetation, including grassland used for foraging and hedgerows/other linear features used for commuting, with appropriate native species (or translocation of previously removed vegetation) to ensure any losses are temporary only. ● Sensitive timing of construction works to avoid periods of highest bat activity, i.e. daytime working only. This will alleviate the need for artificial lighting which could otherwise cause disturbance. ● Best practice such as 'Guidance Notes for the Reduction of Obtrusive Light' (Institute of Lighting Professionals, 2011) to avoid	

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Adverse effects after mitigation
			significant effects due to increased light (if works are programmed at night). ● Avoidance of trees which may be used as roosts by Bechstein's bats. Provide a buffer of at least 50m from such features to avoid disturbance through light, noise and vibration. ● If a confirmed tree roost is directly or indirectly impacted (i.e. through loss/damage, or noise/vibration/light disturbance), then a Natural England protected species licence will be required before works start, which will detail specific measures to avoid offences and compensation measures to replace the lost roost. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	

Source: Mott MacDonald Limited, 2023

16.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on any of the Habitats Sites during the construction phase, provided the recommended mitigation measures are implemented at the project level. Mitigation which may be progressed at the project stage could include the use of best-practice pollution and sediment control measures, surface watercourse, woodland and grassland habitat avoidance via directional drilling, habitat retention and replacement (if necessary), sensitive timings of works and, if required, a Natural England licence for Bechstein's bat.

No impact pathways during the operational phase of the option have been identified on Habitats Sites or their qualifying features.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. Mitigation measures have been proposed for construction phases at all sites. Nevertheless, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Evaluation and modelling of emissions from traffic (heavy goods vehicles), plant and non-road mobile machinery to determine if heavy goods vehicle restrictions are required during construction works within close proximity to functionally linked habitats for qualifying features of the Beer Quarry & Caves SAC.
- Desk based noise assessment to determine extent of the ZoI once more information is available on construction methodology.
- A Preliminary Roost Assessment is recommended on all mature trees present within 50m of the proposed transfer pipeline and any construction access routes. This will determine the potential of trees within the proposed development site and its immediate surroundings to support roosting Bechstein's bat. Subsequent targeted surveys on trees with the potential to support roosting bats would be required. Activity surveys are recommended to determine the species composition within the proposed development site, how qualifying features utilise the habitats present within the site, and the presence or likely absence of these species surrounding the proposed pipeline construction.
- A detailed review of the baseline ecological data including bat populations is recommended to determine more targeted mitigation measures.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It is also recommended that a Construction Environmental Management Plan be put in place that would include the proposed mitigation measures in this AA as well as any other specific measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

17 WIM12 Allers Springs

17.1.1 Stage 1 Screening

The Stage 1 Screening identified two Habitats Sites within the ZoI of WIM12 (Table 17.1). LSE were ruled out for all of these sites.

Information on the qualifying features of the assessed Habitats Sites is provided in Appendix B.

Table 17.1: WIM12 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
	Exe Estuary SPA (approximately 26km south / 35km downstream)
	Exe Estuary Ramsar (approximately 26km south / 35km downstream)
	Dawlish Warren SAC (approximately 35km south / 46km downstream)

Source: Mott MacDonald Limited, 2023

17.1.2 Exe Estuary SPA

This option is outside of SSSI IRZ associated with the SPA (Exe Estuary SSSI) and therefore is sufficiently distant from the proposed works that no significant effects are anticipated during construction.

There is not a direct surface connection between the option and the SPA; the nearest watercourse to the site is approximately 80m east, Town Leat, which flows into the River Lowman approximately 2.9km downstream. A further 1km downstream is the confluence with the Rive Exe at Tiverton; this point is still over 30km upstream from the Habitats Sites. The WFD Level 2 assessment, although low in confidence, concludes that increased abstraction is unlikely to result in deterioration of the groundwater body ‘Permian Aquifers in Central Devon’ or impede its Good Ecological Status. However, some uncertainty remains over whether increased abstraction will affect water balance and flows to surface watercourses, i.e Town Leat.

Although Town Leat is hydrologically connected to the SPA, it is not anticipated that a reduction in flow will have significant effects on the SPA or its qualifying features. Town Leat is a small watercourse which is not expected to have a proportionately large influence on the overall flow and ecological status of the River Exe, especially as far downstream as the SPA boundary; other main rivers join the River Exe upstream of the SPA and are expected to compensate for any reductions in flow experienced with Town Leat. As such, no significant effects are anticipated during operation.

17.1.3 Exe Estuary Ramsar

The hydrological connection between this option and the Ramsar is the same as described for the Exe Estuary SPA above. The same impact pathways are present during construction and operation, due to the identical extent of the site boundaries and considerable overlap in qualifying features.

17.1.4 Dawlish Warren SAC

This option is outside of SSSI IRZ associated with the SAC (Dawlish Warren SSSI) and therefore is sufficiently distant from the proposed works that no significant effects are anticipated during construction.

The hydrological connection between this option and the SAC is the same as described for the Exe Estuary SPA above. The same pathway is present during operation, albeit it this SAC is further downstream of the option.

It is considered that no likely significant effects are anticipated on any of the Habitats Sites. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Habitats Sites or their qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, these Habitats Sites are not considered further.

18 WIM14 Whitecross Distribution Upgrade

18.1 Stage 1 Screening

The Stage 1 Screening identified five Habitats Sites within the ZoI of WIM14 (Table 18.1). LSE could not be ruled out for two of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B.

Table 18.1: WIM14 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
Exe Estuary SPA (approximately 2.6km south-west / 4.2km downstream)	East Devon Pebblebed Heaths SAC (approximately 2.8km south-east)
Exe Estuary Ramsar (approximately 2.6km south-west / 4.2km downstream)	East Devon Heaths SPA (2.8km south-east)
	Dawlish Warren SAC (approximately 10.3km south / 12.8km downstream)

Source: Mott MacDonald, 2023

18.1.1 Exe Estuary SPA

There is a hydrological connection between the option and the SPA through the WFD groundwater waterbody IDs GB40802G801800 (Central Devon and Exe-Aylesbeare Mudstone) and GB40801G801700 (Permian Aquifers in Central Devon), and downstream of the River Clyst. This option is outside of the SSSI IRZ associated with the SPA (Exe Estuary SSSI), and therefore the transfer of any pollutants through the groundwater is not anticipated to have a significant effect, even though this site has been identified as a GWDTE. However, as a precautionary approach, it is assumed that pollution events, if they were to occur during construction, could be transferred through the surface water connection and into the site boundary.

Due to this connectivity, it is possible that habitats which support the qualifying features, and flora and fauna for which qualifying features rely, may be degraded through pollution; these food resources and refuges may be lost and result in changes to the population sizes and distribution of qualifying features within or from the site. During construction, there may be increases in suspended sediment which can result in dissolved oxygen sags and increased turbidity. This could have temporary impacts on the spatial distribution of sediments and topographic features downstream within the estuary. The deposition of excess sediments could also smother benthic communities, reducing the habitat mosaic and creating anoxic conditions. The incidental release of pollutants during construction could increase contaminant levels in the water column and sediment, which over time could bioaccumulate into species present. Construction works can also facilitate the spread of invasive non-native species into the SPA.

The new pipeline infrastructure bisects floodplain grazing marsh habitat surrounding the River Clyst, which could be suitable for supporting the overwintering bird assemblage outside of the SPA boundary. It is possible that this functionally linked habitat is lost, damaged or degraded, displacing these species from suitable foraging areas and ultimately affecting their distribution within and outside of the SPA.

During construction there may also be indirect effects to the integrity of the Exe Estuary SPA through disturbance; noise, visual disturbance and artificial light are all sources of disturbance

which could impact upon qualifying features. Disturbance can result in changes to feeding or roosting behaviours, increased energy expenditure due to more frequent flights, abandonment of nests, disrupted incubation of eggs and desertion of supporting habitat. Disturbance to qualifying species when foraging may jeopardise adult fitness, survival and breeding success by displacing birds from preferred feeding grounds. The effects of displacement may be temporary or permanent and reduce the overall extent, distribution and population sizes associated with the SPA.

No other impact pathways are present during construction due to the distance of the site from the option.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

Likely significant effects cannot be ruled out on the Exe Estuary SPA during the construction stage of the option. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

18.1.2 Exe Estuary Ramsar

The hydrological connection between this option and the Ramsar is the same as described for the Exe Estuary SPA above. The same impact pathways are present during construction and operation, due to the identical extent of the site boundaries and considerable overlap in qualifying features.

Likely significant effects cannot be ruled out on the Exe Estuary Ramsar during the construction stage of the option. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

18.1.3 East Devon Pebblebed Heaths SAC

Although there is a hydrological connection between the option and the SAC through the WFD groundwater waterbody ID GB40802G801800 (Central Devon and Exe-Aylesbeare Mudstone), the distance is sufficient that the option is outside of the SSSI IRZ associated with the SAC (East Devon Pebblebed Heaths SSSI) and no significant effects are anticipated during construction, even though this site has been identified as a GWDTE.

No other impact pathways are present during construction due to the distance of the site from the option.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the East Devon Pebblebed Heaths SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

18.1.4 East Devon Heaths SPA

Although there is a hydrological connection between the option and the SPA through the WFD groundwater waterbody ID GB40802G801800 (Central Devon and Exe-Aylesbeare Mudstone), the distance is sufficient that the option is outside of the SSSI IRZ associated with the SPA (East Devon Pebblebed Heaths SSSI) and no significant effects are anticipated during construction, even though this site has been identified as a GWDTE.

The habitats surrounding the option are not considered to be functionally linked to the SPA and therefore the qualifying features will not be present and at risk of disturbance from construction-related activities.

No other impact pathways are present during construction due to the distance of the site from the option.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the East Devon Heaths SPA. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

18.1.5 Dawlish Warren SAC

Although there is a hydrological connection between the option and the SAC through the WFD groundwater waterbody ID GB40801G801700 (Permian Aquifers in Central Devon) and downstream on the River Exe, the distance is sufficient that the option is outside of the SSSI IRZ associated with the SAC (Dawlish Warren SSSI) and no significant effects are anticipated during construction, even though this site has been identified as a GWDTE. The distance downstream through the surface water connection is sufficient that there will be no significant effects from pollution, if such an event was to occur.

No other impact pathways are present during construction due to the distance of the site from the option.

There are no impact pathways present during operation, and therefore no likely significant effects are anticipated.

It is considered that no likely significant effects are anticipated on the Dawlish Warren SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

18.2 Appropriate Assessment

18.2.1 Scope

The following sites were assessed at Stage 2 AA:

- Exe Estuary SPA (approximately 2.6km south-west / 4.2km downstream)
- Exe Estuary Ramsar (approximately 2.6km south-west / 4.2km downstream)

An assessment of each potential impact on the integrity of the designated site is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 18.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

18.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

These measures are defined as industry-wide best practice measures to address common risks in the construction and development sectors and thus are proven to reduce the risk of the identified effects in so far as is reasonably possible.

The assumption, in the absence of detailed design or recent survey data, is that significant proportions of the overall Exe Estuary SPA and Ramsar populations use habitats surrounding the option adjacent to the River Clyst for foraging and/or roosting over winter, and are therefore at risk of disturbance during construction.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option WIM14, there was no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. All waterbodies were screened out for significant effects at the Level 1 assessment. The WFD assessment concluded the confidence in the screening outcome is low, and so temporary effects of pollution transferred through the surface water during construction have been assessed as a precautionary approach to the HRA.

Table 18.2: Potential adverse effects on integrity of Habitats Sites from option WIM14

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
Exe Estuary SPA (approximately 2.6km south-west / 4.2km downstream)	All	This option may have the following temporary or permanent effects on the qualifying features during the construction phase: ● Toxic contamination – pollution of the River Clyst which could be transferred downstream to within the SPA and functionally linked habitat, resulting in degradation of habitats which support qualifying features. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off during construction. This could lead to increased silt deposition and smothering of habitats downstream within the SPA and functionally linked habitat which support the qualifying features. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in supporting habitats. ● Non-physical disturbance - visual, noise, vibration and artificial light disturbance within the functionally linked habitat during construction may result in changes to feeding behaviours. Disturbance can change regular behaviours, the use of preferred areas, and ultimately adult survival and future population viability. ● Biological disturbance - changes to habitat availability from the above impact pathways, resulting in a reduction in adult survival over winter. This can subsequently result in changes in distribution of populations associated with the SPA, through displacement to other, potentially sub-optimal, areas.	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Biosecurity measures to ensure appropriate removal and/or management control of INNS at source. ● Best practice such as 'Guidance Notes for the Reduction of Obtrusive Light' (Institute of Lighting Professionals, 2011) to avoid significant effects due to increased light (if works are programmed at night). ● Specific mitigation to reduce increased sedimentation and silt deposition downstream include: – Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; – Planning silt screening around the area of works to limit the movement and redeposition of material; and – Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. ● Directional drilling, or other no-dig techniques, should be used to cross watercourses over 3m wide and suitable functionally linked habitats (such as floodplain grazing marsh), where	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features.	proposed pipeline alignments bisect them. This includes a 10m buffer distance either side of the watercourses and grazing marsh to limit impact pathways into these habitats. The pipeline will also be installed to a depth that does not cause vibration disturbance or subsidence of the watercourse bed. This will also reduce indirect effects of pollution downstream within the watercourses. ● Sensitive timing of construction works to avoid the overwintering period for qualifying species detailed in the Exe Estuary SPA conservation advice - July to April inclusive. ● Any works which are undertaken between July and April which may disturb or displace this species from suitable functional land will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population in the advice note and works will be supervised by an ornithological watching brief. ● Additional working methods which will reduce disturbance to overwintering birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise. – Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark greens, grey or black will blend in to the background when moving. – All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older	

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. – All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical 'beeps'. This approach is considered to be precautionary in the absence of recent survey data. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction.	
Exe Estuary Ramsar (approximately 2.6km south-west / 4.2km downstream)	All	See "Possible adverse effects before mitigation" listed above for all features of the Exe Estuary SPA.	See "Indicative mitigation measures" listed above for all features of the Exe Estuary SPA.	No adverse effects.

Source: Mott MacDonald, 2023

18.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on any of the Habitats Sites during the construction phase, provided the recommended mitigation measures, are implemented at the project level. Mitigation which may be progressed at the project stage should include the use of best-practice pollution and sediment control measures, surface watercourse and floodplain grazing marsh habitat avoidance via directional drilling, and sensitive timings of works.

No impact pathways during the operational phase of the option have been identified on Habitats Sites or their qualifying features.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Evaluation and modelling of emissions from traffic (heavy goods vehicles), plant and non-road mobile machinery to determine if heavy goods vehicle restrictions are required during construction works within close proximity to functionally linked habitats for qualifying features of the Exe Estuary SPA and Ramsar (overwintering birds).
- Desk based noise assessment to determine extent of the ZoI once more information is available on construction methodology.
- A desk-based hydro-geological assessment is required when more information is available to ensure that the pipeline installation proposed does not cause subsidence of the riverbed on the River Clyst or any adjacent floodplain grazing marsh habitat.
- A detailed review of the baseline ecological data for qualifying birds, to inform the requirement for additional monitoring and to determine more targeted mitigation measures. This is likely to include wintering bird surveys.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It is also recommended that a Construction Environmental Management Plan be put in place that would include the proposed mitigation measures in this AA as well as any other specific measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

19 WIM18 Cheddar 2 to Bickham Moor – New Strategic Regional Reservoir, Treatment and Transfer

19.1 Overview

This is an SRO option which is being developed and assessed externally through the SRO RAPID Gated process, and as such the complete HRA is not currently available to summarise within this report. Supply Option WIM18 includes the construction and operation of a new Cheddar 2 reservoir, which is the same as another feasible SRO within the WRMP, option BNW17 'Cheddar 2 New Strategic Regional Reservoir and Transfer'. The summary of option BNW17 is provided in the subsequent sections, although the transfer routes of BNW17 and WIM18 differ significantly; BNW17 involves the transfer of water to Summerslade SR within the Bournemouth WRZ, as opposed to Bickham Moor within the Wimbleball WRZ.

Some of the components are common to both options. The initial construction of the new Cheddar 2 reservoir, abstraction points and pipelines to the new reservoir, the construction of a new WTW at Honeyhurst, and pipeline infrastructure between Cheddar 2 and Honeyhurst WTW. For the purpose of this HRA report, the information was not available to identify all Habitats Sites within the assessment of BNW17 which are not applicable to WIM18. However, the provision of an SEA assessment for WIM18 identifies some Habitats Sites, although not necessarily a full suite, which are only relevant to WIM18; these are detailed below, but likely significant effects are not available.

19.2 Stage 1 screening

A total of 15 Habitats Sites were screened in based on their proximity (10km radius) and hydrological connectivity to the proposed BNW17 SRO. LSE were identified on 12 Habitats Sites during construction works: Severn Estuary SAC, SPA and Ramsar, Mendip Limestone Grasslands SAC, Mendip Woodlands SAC, North Somerset and Mendip Bats SAC, River Avon SAC, Chew Valley Lake SPA, Chilmark Quarries SAC, Mells Valley SAC and Somerset Levels SPA and Ramsar.

LSEs were also identified for 10 Habitats Sites during operation of the proposed BNW17 SRO: Severn Estuary SAC, SPA and Ramsar, Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, Chew Valley Lake SPA, Chilmark Quarries SAC, Mells Valley SAC and Somerset Levels SPA and Ramsar.

Within the WIM18 SEA, the following Habitats Sites were identified within 1km of the pipeline transfer route to Bickham Moor: Somerset Levels & Moors SPA and Ramsar, Severn Estuary SAC, SPA and Ramsar, Mendip Woodlands SAC, Exmoor & Quantock Woodlands SAC and Culm Grasslands SAC. This does not necessarily constitute a complete list, nor does it mean that likely significant effects, and subsequently adverse effects on integrity, are anticipated on any or all of these Habitats Sites.

19.3 Stage 2 Appropriate Assessment outcomes and recommendations

19.3.1 Construction effects

The Stage 2 AA for BNW17 concluded that adverse effects cannot be ruled out at this stage as a result of direct habitat loss, deterioration, air emissions and noise disturbance. This is due to

uncertainties regarding construction programme, number of heavy goods vehicles, anthropogenic noise and functioning role of habitat directly within the scheme footprint.

19.3.2 Operation effects

The Stage 2 AA for BNW17 concluded that adverse effects cannot be ruled out at this stage as a result of uncertainties regarding the impact of reduced flows in the River Axe and River Yeo on the adjacent rhyne/ditch network. Reduced flows may also affect pass forward flows into the Severn Estuary and dissolved oxygen sags. These effects cannot be ruled out on all Habitats Sites progressed to the Stage 2 AA.

Additionally, a range of gaps in design and bespoke assessment were identified. This is expected given that Gate 2 is to review scheme feasibility.

19.3.3 In-combination assessment

No in-combination effects with other plans and projects were identified with the BNW17 SRO.

19.3.4 Outcomes and recommendations

Further monitoring is recommended within the SRO HRA for Gate 3 to support the HRA assessment of the scheme.

It is the opinion of this HRA report that no adverse effects on site integrity can be concluded on any of the Habitats Sites during the construction phase of SRO BNW17, provided the principles outlined in the ‘Next Steps’ section below (Section 27), and the recommended mitigation measures within the SRO HRA, are implemented at the project level.

It is the opinion of this HRA that no adverse effect on site integrity can be concluded for SRO BNW17 during operation, on the understanding that further research identified in the conclusion of the SRO Appropriate Assessment, and within the SRO WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

As a result, SRO BNW17 would have no appreciable effect on the integrity of any Habitat Sites within the ZoI and therefore would not contribute to any in-combination effects.

It should be noted that the conclusions contained in the SRO HRA are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

This report will be updated following full details of the WIM18 HRA, for summary and inclusion within in-combination assessments.

20 dB1 Wimborne Borehole

20.1 Stage 1 Screening

The Stage 1 Screening identified seven Habitats Sites within the ZoI of dB1 (Table 20.1). LSE could not be ruled out for three of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 20.1: dB1 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
Dorset Heathlands SPA (approximately 3.3km south)	Dorset Heathlands Ramsar (approximately 4.6km north-east)
River Avon SAC (approximately 12.5km east / 29km downstream)	Dorset Heaths SAC (approximately 3.3km south)
Solent and Dorset Coast SPA (approximately 12.6km south-east / 25.2km downstream)	Poole Harbour SPA (approximately 8km south)
	Poole Harbour Ramsar (approximately 8km south)

Source: Mott MacDonald, 2023

20.1.1 Dorset Heathlands Ramsar

This option is outside of the SSSI IRZ associated with this Ramsar (Corfe & Barrow Hills SSSI is the nearest component SSSI) and therefore no significant effects are anticipated during construction. Although the Ramsar has been identified as a GWDTE, there is no hydrological connectivity through the groundwater, or surface water.

There is no hydrological connectivity between the option and the Ramsar and therefore no impact pathways are present during operation of the borehole and increased abstraction.

It is considered that no likely significant effects are anticipated on the Dorset Heathlands Ramsar. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Ramsar site or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

20.1.2 Dorset Heaths SAC

This option is outside of the SSSI IRZ associated with this Ramsar (Corfe & Barrow Hills SSSI is the nearest component SSSI) and therefore no significant effects are anticipated during construction. Although the Ramsar has been identified as a GWDTE, there is no hydrological connectivity through the groundwater, or surface water.

There is no hydrological connectivity between the option and the Ramsar and therefore no impact pathways are present during operation of the borehole and increased abstraction.

It is considered that no likely significant effects are anticipated on the Dorset Heaths SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

20.1.3 Dorset Heathlands SPA

This option is outside of the SSSI IRZ associated with this SPA and therefore no significant effects are anticipated within the SPA boundary during construction. However, the option is adjacent to floodplain grazing marsh habitat bordering the River Allen, which could be functionally linked habitat for overwintering hen harrier associated with the SPA.

It is possible that habitats which support the qualifying features, and flora and fauna for which qualifying features rely, may be degraded through pollution; these food resources and refuges may be lost and result in displacement of qualifying features, distribution and changes to the population sizes within or from the area.

During construction there may also be indirect effects to the integrity of the Dorset Heathlands SPA through disturbance; noise, visual disturbance and artificial light are all sources of disturbance which could impact upon qualifying features. Disturbance can result in changes to feeding or roosting behaviours, increased energy expenditure due to more frequent flights, and desertion of supporting habitat. Disturbance to qualifying species when foraging may jeopardise adult fitness and survival over winter by displacing birds from preferred feeding grounds. The effects of displacement may be temporary or permanent and reduce the overall extent, distribution and population sizes associated with the SPA.

There is no direct hydrological connectivity between the option and the SPA and therefore no impact pathways within the SPA boundary during operation. However, reductions in the local groundwater level as a result of abstraction during operation may result in degradation of suitable functionally linked habitat for hen harrier. As mentioned above, changes to functionally linked habitats may result in displacement of this species and reductions in extent, distribution and overall population size associated with the SPA.

Likely significant effects cannot be ruled out on the Dorset Heaths SPA during the construction or operation stages of the option. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

20.1.4 Poole Harbour SPA

This site is sufficiently distant from the proposed works, outside of the SSSI IRZ associated with the SPA and not hydrologically connected to the option footprint. As such, there are unlikely to be any effects during construction or operation of the option.

It is considered that no likely significant effects are anticipated on the Poole Harbour SPA. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SPA or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

20.1.5 Poole Harbour Ramsar

This site is sufficiently distant from the proposed works, outside of the SSSI IRZ associated with the Ramsar site and not hydrologically connected to the option footprint. As such, there are unlikely to be any effects during construction or operation of the option.

It is considered that no likely significant effects are anticipated on the Poole Harbour Ramsar. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Ramsar site or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

20.1.6 River Avon SAC

The option is not directly hydrologically connected to the SAC via surface water. Surface water run off may enter the nearby River Allen (approximately 120m southwest from the borehole location) which provides surface water connectivity to the SAC. However, the SAC is sufficiently distant downstream (approximately 29km) that no significant effects from pollution of the water environment within the SAC, if such an event was to occur during construction, are anticipated.

The distance from the site to the option is sufficiently far that there are no other impact pathways during construction.

During operation, it is possible that the increased groundwater abstraction may affect the nearby River Allen, reducing base flow velocity and volume downstream of this location. The River Allen joins the River Stour at Wimborne before flowing into Christchurch Harbour. Although this is outside of the SAC boundary, Christchurch Harbour is the entry point from the English Channel for sea lamprey and Atlantic salmon to migrate into the SAC and spawn in areas further upstream. Changes to conditions downstream of the SAC caused by reduced flow volume and/or velocity may effectively create barriers to migration, meaning that the overall extent, distribution and viable population sizes of this migratory species are reduced.

Likely significant effects cannot be ruled out on the River Avon SAC during the operation stage of the option. As such this SAC has been progressed to Stage 2 Appropriate Assessment.

20.1.7 Solent and Dorset coast SPA

The option is not directly hydrologically connected to the SPA via surface water. Surface water run off may enter the nearby River Allen (approximately 120m southwest from borehole location) which provides surface water connectivity to the SPA. However, the SPA is sufficiently distant downstream (approximately 25.2km) that no significant effects from pollution of the water environment within the SPA, if such an event was to occur during construction, are anticipated.

The distance from the site to the option is sufficiently far that there are no other impact pathways during construction.

During operation, it is possible that the increased groundwater abstraction may affect the nearby River Allen, reducing base flow velocity and volume downstream of this location. The River Allen joins the River Stour at Wimborne before flowing into Christchurch Harbour. The lower reaches of the River Stour are within the SPA boundary, providing suitable habitat to support the qualifying features during the breeding season. Changes to the conditions within the stour and the harbour may affect the population sizes and distribution of prey items, thus displacing them to other areas where conditions are more suitable. The effects of displacement may be temporary or permanent, leading to changes in the extent, distribution, and viable population sizes of the qualifying features associated with the SPA.

Likely significant effects cannot be ruled out on the Solent and Dorset Coast SPA during the operation stage of the option. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

20.2 Appropriate Assessment

20.2.1 Scope

The following sites were assessed at Stage 2 AA:

- Dorset Heathlands SPA (approximately 3.3km south)
- River Avon SAC (approximately 12.5km east / 29km downstream)
- Solent and Dorset Coast SPA (approximately 12.6km south-east / 25.2km downstream)

An assessment of each potential impact on the integrity of the designated site is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 20.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

20.2.2 Assumptions and mitigation measures

Based on the current level of information, assumed and established mitigation measures are proposed below that will need to be followed at project level to avoid or mitigate effects.

These measures are defined as industry-wide best practice measures to address common risks in the construction and development sectors and thus are proven to reduce the risk of the identified effects in so far as is reasonably possible.

The assumption, in the absence of detailed design or recent survey data, is that significant proportions of the hen harrier population associated with the Dorset Heathland SPA use habitats surrounding the option adjacent to the River Allen for foraging over winter, and are therefore at risk of disturbance during construction.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option dB1, there was no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. All waterbodies were screened out for significant effects at the Level 1 assessment. The WFD assessment concluded the confidence in the screening outcome is low, and so temporary effects of pollution transferred through the surface water during construction have been assessed as a precautionary approach to the HRA. Any water transfer from the Wimborne borehole must be incorporated into the RBMP and the implications of future design changes on the conservation objectives of the Dorset Heathlands SPA, River Avon Sac and/or Solent and Dorset Coast SPA should be assessed in accordance with the 2017 Regulations

Table 20.2: Potential adverse effects on integrity of Habitats Sites from option dB1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
Dorset Heathlands SPA (approximately 3.3km south)	Hen harrier (overwintering)	This option may have the following temporary or permanent effects on the qualifying features during the construction phase: ● Toxic contamination – pollution of the surrounding habitat which could be transferred through the groundwater to functionally linked habitat, resulting in degradation of habitats which support qualifying features. ● Non-toxic contamination - habitat degradation via changes in water quality caused by increased suspended sediment and turbidity from associated run-off during construction. This could lead to increased silt deposition and smothering of functionally linked habitat which support the qualifying features. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in supporting habitats. ● Non-physical disturbance - visual, noise, vibration and artificial light disturbance within the functionally linked habitat during construction may result in changes to feeding behaviours. Disturbance can change regular behaviours, the use of preferred areas, and ultimately adult survival and future population viability. ● Biological disturbance - changes to habitat availability from the above impact pathways, resulting in a reduction in adult survival over winter. This can subsequently result in changes in distribution of populations associated with the SPA, through displacement to other, potentially sub-optimal, areas. This option may have the following permanent effects on the qualifying features during operation:	The following measures will be implemented to avoid or reduce adverse effects, and should be progressed to the project stage: ● CIRIA C741 Environmental good practice on site guide. ● Environment Agency's PPGs (PPG1: General Guide to Prevention of Pollution; PPG6: Pollution prevention guidance for working at construction and demolition sites). ● Best practice such as 'Guidance Notes for the Reduction of Obtrusive Light' (Institute of Lighting Professionals, 2011) to avoid significant effects due to increased light (if works are programmed at night). ● Sensitive timing of construction works to avoid the overwintering period for hen harrier detailed in the Dorset Heathlands SPA conservation advice – September to March inclusive. ● Any works which are undertaken between September and March which may disturb or displace this species from suitable functional land will only be permitted if the population present at risk of disturbance is less than 1% of the cited SPA population in the advice note and works will be supervised by an ornithological watching brief. ● Additional working methods which will reduce disturbance to overwintering birds during construction include: – A slow construction start allowing plant engines to idle for five minutes to allow acclimatisation to additional noise.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		• Water table availability – a reduction in flow and water level within functionally linked habitat due to the increased abstraction. This may affect the suitability of habitats for supporting hen harrier. • Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in the extent and/or distribution of habitats which support hen harrier, from the changes in groundwater level. Permanent loss of supporting habitat adjacent to the River Allen. • Biological disturbance – reductions in the extent of habitats which support qualifying species, which may subsequently lead to changes in distribution, extent and future population viability of qualifying features, as a result of the above impact pathways. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.	– Plant machinery to be painted/camouflaged to be less conspicuous; it is unlikely that all plant will be effectively screened by barriers due to size. The use of netting or colours in dark greens, grey or black will blend in to the background when moving. – All plant and equipment will be in good working order to reduce potential engine and machinery noise associated with older equipment. Advances in technology will be utilised, including the use of electric and hybrid alternatives. – All flashing beacons will be removed to avoid visual disturbance unless safety critical. White noise reversing warnings will be used instead of typical 'beeps'. This approach is considered to be precautionary in the absence of recent survey data. The development of a Construction and Environmental Management Plan will include all the above proposed mitigation measures and any further measures identified from additional studies at the project stage. Following the implementation of industry-wide best practice measures, no adverse effects are anticipated during construction. Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the Wimborne borehole. The operational limits of the abstraction from the Reading Beds that will be imposed by the updated	

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
			South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	
	Merlin (overwintering) Nightjar (breeding) Woodlark (breeding) Dartford warbler (breeding)	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects
River Avon SAC (approximately 12.5km east / 29km downstream)	Sea lamprey Atlantic salmon	There are no impact pathways during construction. This option may have the following permanent effects on sea lamprey and Atlantic salmon during operation: ● Water table availability – a reduction in flow and water level within the River Allen and River Stour due to the increased abstraction. This may affect the suitability of habitats downstream of the SAC for qualifying fish species. ● Toxic contamination – reduced dilution in the functionally linked habitats which are downstream of the SAC, which may result in the degradation of river habitats which support qualifying fish species, through chemical changes as a result of reduced flow. ● Non-toxic contamination – reduced flows and water levels may lead to the degradation of river habitats which support qualifying fish species, through increased suspended sediment, siltation and smothering of preferred foraging and spawning grounds. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the Wimborne borehole, and its interaction with the River Allen and River Stour. The operational limits of the abstraction from the Reading Beds that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		reduction in the extent and/or distribution of habitats which support qualifying fish species, from the changes in flow and water level. ● Biological disturbance – changes to habitat availability from the above impact pathways, leading to the displacement of these features within functionally linked habitat and jeopardising future spawning success, adult survival and population viability. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		
	Rivers with floating vegetation often dominated by water-crowfoot Desmoulin's whorl snail Brook lamprey Bullhead	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.
Solent and Dorset Coast SPA (approximately 12.6km south-east / 25.2km downstream)	All	There are no impact pathways during construction. This option may have the following permanent effects on the qualifying features during operation: ● Water table availability – a reduction in flow and water level within the River Allen and River Stour due to the increased abstraction. This may affect the suitability of habitats downstream within the SPA boundary. ● Toxic contamination – reduced dilution in the SPA downstream, which may result in the degradation of river habitats which support qualifying species and their prey, through chemical changes as a result of reduced flow. ● Non-toxic contamination – reduced flows and water levels may lead to the degradation of river habitats which support qualifying species and	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the Wimborne borehole, and its interaction with the River Allen and River Stour. The operational limits of the abstraction from the Reading Beds that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		their prey, through increased suspended sediment, siltation and smothering of preferred foraging grounds. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in the extent and/or distribution of habitats which support qualifying species, from the changes in flow and water level. ● Biological disturbance – changes to habitat availability from the above impact pathways, leading to the displacement of these features within functionally linked habitat and jeopardising future spawning success, adult survival and population viability. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		

Source: Mott MacDonald, 2023

20.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effects on site integrity are anticipated on the Dorset Heathlands SPA during the construction phase, provided the recommended mitigation measures, are implemented at the project level. Mitigation which may be progressed at the project stage should include the use of best-practice pollution and sediment control measures and sensitive timings of works.

No adverse effect on site integrity can be concluded for option dB1 during operation, on the understanding that further research identified in the conclusion of this Appropriate Assessment, and within the WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydro-ecology studies and hydrodynamic modelling of groundwater levels and flows to identify whether the changes in the water levels from the increased groundwater abstraction would have an adverse effect on the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites within the ZoI, and their qualifying features. This applies to the Dorset Heathlands SPA and functionally linked habitats which may be used by the qualifying hen harrier population, the Solent and Dorset Coast SPA, and functionally linked habitat for sea lamprey and Atlantic salmon associated with the River Avon SAC.
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential adverse effects on the functionally linked habitat for sea lamprey and Atlantic salmon associated with the River Avon SAC, and within the Solent and Dorset Coast SPA downstream on the River Stour. Future modelling will need to be refined once further information is available.
- A detailed review of the baseline ecological data, including hen harrier populations, is also recommended to determine data gaps and additional surveys required to inform more targeted mitigation measures during construction and operation. This is likely to require targeted surveys within the suitable habitats surrounding the option.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It is also recommended that a Construction Environmental Management Plan be put in place that would include the proposed mitigation measures in this AA as well as any other specific measures identified following an HRA undertaken at project level.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

21 dB2 Stanbridge Licence

21.1 Stage 1 Screening

The Stage 1 Screening identified five Habitats Sites within the ZoI of dB2 (Table 21.1). LSE could not be ruled out for two of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 21.1: dB2 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
River Avon SAC (approximately 12.5km east / 30.3km downstream)	Dorset Heathlands SPA (approximately 5.2km south-east)
Solent and Dorset Coast SPA (approximately 20km south-east / 36.5km downstream)	Dorset Heaths SAC (approximately 5.2km south-east)
	Dorset Heathlands Ramsar (approximately 5.2km south-east)

Source: Mott MacDonald, 2023

21.1.1 Dorset Heathlands SPA

There are no infrastructure changes associated with this option and therefore no construction phase. The option is outside of the SSSI IRZ associated with the SPA and therefore no significant effects are anticipated.

There is no hydrological connectivity between the option and the SPA and therefore no significant effects are anticipated from increased groundwater abstraction during operation.

It is considered that no likely significant effects are anticipated on the Dorset Heathlands SPA. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SPA or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

21.1.2 Dorset Heaths SAC

There are no infrastructure changes associated with this option and therefore no construction phase. The option is outside of the SSSI IRZ associated with the SPA and therefore no significant effects are anticipated.

There is no hydrological connectivity between the option and the SAC and therefore no significant effects are anticipated from increased groundwater abstraction during operation.

It is considered that no likely significant effects are anticipated on the Dorset Heaths SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

21.1.3 Dorset Heathlands Ramsar

There are no infrastructure changes associated with this option and therefore no construction phase. The option is outside of the SSSI IRZ associated with the SPA and therefore no significant effects are anticipated.

There is no hydrological connectivity between the option and the Ramsar site and therefore no significant effects are anticipated from increased groundwater abstraction during operation.

It is considered that no likely significant effects are anticipated on the Dorset Heathlands Ramsar. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the Ramsar site or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

21.1.4 River Avon SAC

There are no infrastructure changes associated with this option and therefore no construction phase.

The option is not directly hydrologically connected to the SAC via surface water or groundwater. However, the nearby River Allen (approximately 120m southwest from borehole location) provides surface water connectivity to the SAC downstream.

During operation, it is possible that the increased groundwater abstraction may affect the nearby River Allen, reducing base flow velocity and volume downstream of this location. The River Allen joins the River Stour at Wimborne before flowing into Christchurch Harbour. Although this is outside of the SAC boundary, Christchurch Harbour is the entry point from the English Channel for sea lamprey and Atlantic salmon to migrate into the SAC and spawn in areas further upstream. Changes to conditions downstream of the SAC caused by reduced flow volume of velocity may effectively create barriers to migration, meaning that the overall extent, distribution and viable population sizes of this migratory species are reduced.

Likely significant effects cannot be ruled out on the River Avon SAC during the operation of the option. As such this SAC has been progressed to Stage 2 Appropriate Assessment.

21.1.5 Solent and Dorset Coast SPA

There are no infrastructure changes associated with this option and therefore no construction phase.

The option is not directly hydrologically connected to the SAC via surface water or groundwater. However, the nearby River Allen (approximately 120m southwest from borehole location) provides surface water connectivity to the SAC downstream.

During operation, it is possible that the increased groundwater abstraction may affect the nearby River Allen, reducing base flow velocity and volume downstream of this location. The River Allen joins the River Stour at Wimborne before flowing into Christchurch Harbour. The lower reaches of the River Stour are within the SPA boundary, providing suitable habitat to support the qualifying features during the breeding season. Changes to the conditions within the stour and the harbour may affect the population sizes and distribution of prey items, thus displacing them to other areas where conditions are more suitable. This may result in changes to the extent, distribution, and viable population sizes of the qualifying features associated with the SPA.

Likely significant effects cannot be ruled out on the Solent and Dorset Coast SPA during the operation of the option. As such this SPA has been progressed to Stage 2 Appropriate Assessment.

21.2 Appropriate Assessment

21.2.1 Scope

The following sites were assessed at Stage 2 AA:

- River Avon SAC (approximately 12.5km east / 30.3km downstream)
- Solent and Dorset Coast SPA (approximately 20km south-east / 36.5km downstream)

An assessment of each potential impact on the integrity of the designated site is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 21.2 below, and mitigation measures are proposed. Standard best practice measures are also included within the table; these are not necessarily integrated into the project and therefore considered to be mitigation within this document.

21.2.2 Assumptions and mitigation measures

Based on the current level of information a number of assumptions have been made, relating to principles, which will be followed during option development at the project level.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option dB2, there was no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. All waterbodies were screened out for significant effects at the Level 1 assessment. The WFD assessment concluded the confidence in the screening outcome is low, and therefore a precautionary approach has been taken to this assessment in the absence of detailed further studies. Any water transfer from the Stanbridge licence must be incorporated into the RBMP and the implications of future design changes on the conservation objectives of the River Avon SAC and Solent and Dorset Coast SPA should be assessed in accordance with the 2017 Regulations

Table 21.2: Potential adverse effects on integrity of Habitats Sites from option dB1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
River Avon SAC (approximately 12.5km east / 30.3km downstream)	Sea lamprey Atlantic salmon	There are no impact pathways during construction. This option may have the following permanent effects on sea lamprey and Atlantic salmon during operation: ● Water table availability – a reduction in flow and water level within the River Allen and River Stour due to the increased abstraction. This may affect the suitability of habitats downstream of the SAC for qualifying fish species. ● Toxic contamination – reduced dilution in the functionally linked habitats which are downstream of the SAC, which may result in the degradation of river habitats which support qualifying fish species, through chemical changes as a result of reduced flow. ● Non-toxic contamination – reduced flows and water levels may lead to the degradation of river habitats which support qualifying fish species, through increased suspended sediment, siltation and smothering of preferred foraging and spawning grounds. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in the extent and/or distribution of habitats which support qualifying fish species, from the changes in flow and water level. ● Biological disturbance – changes to habitat availability from the above impact pathways, leading to the displacement of these features within functionally linked habitat and jeopardising	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the Stanbridge borehole, and its interaction with the River Allen and River Stour. The operational limits of the abstraction from the Upper Dorset Stour that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		future spawning success, adult survival and population viability. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		
	Rivers with floating vegetation often dominated by water-crowfoot Desmoulin's whorl snail Brook lamprey Bullhead	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.
Solent and Dorset Coast SPA (approximately 20km south-east / 36.5km downstream)	All	There are no impact pathways during construction. This option may have the following permanent effects on the qualifying features during operation: ● Water table availability – a reduction in flow and water level within the River Allen and River Stour due to the increased abstraction. This may affect the suitability of habitats downstream within the SPA boundary. ● Toxic contamination – reduced dilution in the SPA downstream, which may result in the degradation of river habitats which support qualifying species and their prey, through chemical changes as a result of reduced flow. ● Non-toxic contamination – reduced flows and water levels may lead to the degradation of river habitats which support qualifying species and their prey, through increased suspended sediment, siltation and smothering of preferred foraging grounds. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels.	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the Stanbridge borehole, and its interaction with the River Allen and River Stour. The operational limits of the abstraction from the Upper Dorset Stour that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		• Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in the extent and/or distribution of habitats which support qualifying species, from the changes in flow and water level. • Biological disturbance – changes to habitat availability from the above impact pathways, leading to the displacement of these features within functionally linked habitat and jeopardising future spawning success, adult survival and population viability. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		

Source: Mott MacDonald, 2023

21.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effect on site integrity can be concluded for option dB2 during operation, on the understanding that further research identified in the conclusion of this Appropriate Assessment, and within the WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydro-ecology studies and hydrodynamic modelling of groundwater levels and flows to identify whether the changes in the water levels from the increased groundwater abstraction would have an adverse effect on the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites within the ZoI, and their qualifying features. This applies to the Solent and Dorset Coast SPA, and functionally linked habitat for sea lamprey and Atlantic salmon associated with the River Avon SAC.
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential adverse effects on the functionally linked habitat for sea lamprey and Atlantic salmon associated with the River Avon SAC, and within the Solent and Dorset Coast SPA downstream on the River Stour. Future modelling will need to be refined once further information is available.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

22 dW1 Brampford Speke and Stoke Canon (North Exeter Boreholes)

22.1 Stage 1 Screening

The Stage 1 Screening identified three Habitats Sites within the ZoI of dW1 (Table 22.1). LSE could not be ruled out for any of these three sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B.

Table 22.1: dW1 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
Exe Estuary SPA (approximately 9.8km south / 15.4km downstream)	
Exe Estuary Ramsar (approximately 9.8km south / 15.4km downstream)	
Dawlish Warren SAC (approximately 20.1km south / 26.5km downstream)	

Source: Mott MacDonald, 2023

22.1.1 Exe Estuary SPA

This site is hydrologically connected downstream of the option via the River Exe and the WFD groundwater waterbody ID GB40801G801700 (Permian Aquifers in Central Devon). This site has been identified as a GWDTE, meaning that it is ecologically sensitive to changes in groundwater levels and/or chemistry but the option is outside of the SSSI IRZ associated with this SPA (Exe Estuary SSSI), and therefore is sufficiently distant that no significant effects are anticipated during construction.

During operation, increased groundwater abstraction may result in a reduced flow on the River Exe downstream of this location, possibly resulting in the degradation of habitats which support qualifying features. A general reduction in water table availability within the Exe valley could affect important habitats which support qualifying features, such as saltmarsh and mudflats further downstream.

Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for the colonisation of saltmarsh and mudflat pioneer species, such as excessive nutrient loading. This will subsequently result in reductions in habitat and prey availability for qualifying features, potentially displacing them from preferred foraging and roosting areas within the SPA. This may jeopardise over winter survival and future breeding success, leading to changes in the extent, distribution and future viability of populations sizes associated with the SPA.

Likely significant effects cannot be ruled out on the Exe Estuary SPA during the operation stage of the option. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

22.1.2 Exe Estuary Ramsar

The hydrological connection between this option and the Ramsar is the same as described for the Exe Estuary SPA above. The same impact pathways are present during operation, due to the identical extent of the site boundaries and considerable overlap in qualifying features.

Likely significant effects cannot be ruled out on the Exe Estuary Ramsar during the operation stage of the option. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

22.1.3 Dawlish Warren SAC

This site is hydrologically connected downstream of the option via the River Exe and the WFD groundwater waterbody ID GB40801G801700 (Permian Aquifers in Central Devon). This site has been identified as a GWDTE, meaning that it is ecologically sensitive to changes in groundwater levels and/or chemistry but the option is outside of the SSSI IRZ associated with this SPA (Dawlish Warren SSSI), and therefore is sufficiently distant that no significant effects are anticipated during construction.

During operation, increased groundwater abstraction may result in a reduced flow on the River Exe downstream of this location, possibly resulting in the degradation of qualifying habitats, and habitats which support petalwort *Petalophyllum ralfsii*. A general reduction in water table availability within the Exe valley could affect these habitats, despite their distance downstream.

Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for the colonisation of pioneer dune species, such as excessive nutrient loading. This will subsequently result in reductions qualifying habitats and petalwort, potentially resulting in changes to overall extent, distribution and population size (petalwort only) within the SAC boundary.

Significant effects are only anticipated on ‘humid dune slacks’ and petalwort. Changes to water quality and hydrological regime are not considered to be relevant to the ‘shifting dunes with marram’ and ‘fixed dunes with herbaceous vegetation’ Annex I habitats[52].

Likely significant effects cannot be ruled out on the Dawlish Warren SAC during the operation stage of the option. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

22.2 Appropriate Assessment

22.2.1 Scope

The following sites were assessed at Stage 2 AA:

- Exe Estuary SPA (approximately 9.8km south / 15.4km downstream)
- Exe Estuary Ramsar (approximately 9.8km south / 15.4km downstream)
- Dawlish Warren SAC (approximately 20.1km south / 26.5km downstream)

An assessment of each potential impact on the integrity of the designated site is made, in view of the sites’ structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 22.2 below.

[52] Natural England (2019). European Site Conservation Objectives for Dawlish Warren SAC (UK0030130). Available at: European Site Conservation Objectives for Dawlish Warren SAC - UK0030130 (naturalengland.org.uk)

22.2.2 Assumptions and mitigation measures

Based on the current level of information a number of assumptions have been made, relating to principles, which will be followed during option development at the project level.

At the time of writing, the outcome of the WINEP AMP7 investigation into deterioration on the River Exe is unknown, and is not considered for this assessment. On a precautionary basis this assessment has concluded a potential risk of deterioration of the groundwater catchment.

It is assumed that the River Exe relies on the underlying aquifer for its base flow, and therefore changes to groundwater levels from the additional abstractions will have a significant effect on the flow and water quality downstream of this option.

It is assumed that although there is some of the abstracted groundwater is discharged downstream, the abstraction at Pynes WTW will still result in a net reduction in flow within the River Exe.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option dW1 and the ‘Exe (Barle to Culm)’, there was considered no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. The WFD assessment concluded the confidence in the screening outcome is low, and it was concluded that there was potential for widespread or prolonged effects on the ‘Permian Aquifers in Central Devon’ groundwater waterbody; the River Exe base flow is dependent on this waterbody, as per the assumptions above. Any water transfer from the Permian Aquifers in Central Devon to the River Exe must be incorporated into the RBMP and the implications of future design changes on the conservation objectives of the Exe Estuary SPA, Exe Estuary Ramsar and Dawlish Warren SAC should be assessed in accordance with the 2017 Regulations.

Table 22.2 Potential adverse effects on integrity of Habitats Sites from option dW1

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
Exe Estuary SPA (approximately 9.8km south / 15.4km downstream)	All	No adverse effects are anticipated during construction. This option may have the following permanent effects on the qualifying features during operation: ● Water table availability – a reduction in flow and water level downstream within the SPA due to the increased groundwater abstraction upstream. This may affect both the surface water and groundwater resulting in degradation of habitats which support qualifying features. ● Toxic contamination – reduced dilution in the SPA downstream, which may result in the degradation of habitats which support qualifying features. ● Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of supporting habitats. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in supporting habitats' extent and/or distribution from the impact pathways above. ● Biological disturbance - changes to habitat availability from the above impact pathways, leading to the displacement of qualifying features within or from the SPA and jeopardising adult survival and population viability associated with the SPA. The effects of toxic contamination, non-toxic contamination and physical loss or damage of	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the Permian Aquifers in Central Devon and its interaction with the River Exe. The operational limits of the abstraction from the Permian Aquifers in Central Devon, and discharge to the River Exe, that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		qualifying habitats during construction could be permanent impacts but are likely to be localised. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features.		
Exe Estuary Ramsar (approximately 9.8km south / 15.4km downstream)	All	See "Possible adverse effects before mitigation" listed above for all features of the Exe Estuary SPA.	See "Indicative mitigation measures" listed above for all features of the Exe Estuary SPA.	No adverse effects.
Dawlish Warren SAC (approximately 20.1km south / 26.5km downstream)	Humid dune slacks Petalwort	This option may have the following permanent effects during operation: ● Water table availability – a reduction in flow and water level within the SAC due to the increased groundwater abstraction upstream. This may affect the hydrological regime, resulting in degradation of qualifying habitats and habitats which can support petalwort. ● Toxic contamination – reduced dilution in the SAC downstream, which may result in the degradation of qualifying habitats, and those habitats which can support petalwort populations. ● Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of qualifying habitats. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in qualifying habitats' extent and/or distribution from the impact pathways above.	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the Permian Aquifers in Central Devon and its interaction with the River Exe. The operational limits of the abstraction from the Permian Aquifers in Central Devon, and discharge to the River Exe, that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		Reductions is populations sizes, extent and distribution of petalwort as a result. The identified effects have the potential to reduce the distribution and extent of qualifying Annex I habitats and reduce the distribution, extent and population sizes of petalwort.		
	Shifting dunes with marram Fixed dunes with herbaceous vegetation	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.

Source: Mott MacDonald Limited, 2023

22.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effect on site integrity can be concluded for option dW1 during operation, on the understanding that further research identified in the conclusion of this Appropriate Assessment, and within the WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydrogeological studies and hydrodynamic modelling of flows to identify whether the changes in the water levels from the increased groundwater abstraction would have an adverse effect on the base flow of the River Exe, and subsequently the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites within the ZoI, and their qualifying features. Specific abstraction conditions and adjustment of existing licences may also be required.
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential adverse effects on the Exe Estuary SPA, Exe Estuary Ramsar and Dawlish Warren SAC downstream of the increased abstraction and discharge into the River Exe, within the ZoI. Future modelling will need to be refined once further information is available.
- The results of the WINEP AMP7 investigation into this licence will be incorporated into the assessment when available, determining the requirement for further investigation if deterioration is concluded.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

23 dW2 Hook Springs Licence

23.1 Stage 1 Screening

The Stage 1 Screening identified three Habitats Sites within the ZoI of dW2 (Table 23.1). LSE could not be ruled out for one of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 23.1: dW2 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
River Axe SAC (approximately 3.5km south-east / 4.6km downstream)	Sidmouth to West Bay SAC (approximately 12.7km south / 20.5km downstream)
	Lyme Bay and Torbay SAC (approximately 15.5km south / 21km downstream)

Source: Mott MacDonald, 2023

23.1.1 River Axe SAC

There are no infrastructure changes associated with this option, which proposes an increase in abstraction at the existing Hook Springs intake. There is no direct hydrological connectivity between the option and the site. This option lies outside of the SSSI IRZ associated with this SAC (River Axe SSSI).

During operation, increased abstraction from the Hook Springs may result in a reduced flow volume and velocity within the River Kit and subsequently the River Axe, possibly resulting in the degradation of qualifying Annex I habitats and habitats which support qualifying features. A general reduction in water table availability within the River Axe valley could affect habitats which support qualifying features of the SAC.

Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the habitat availability for qualifying fish species. The potential loss, damage, and smothering of optimal habitats within the River Axe can result in displacement of these species from preferred foraging and commuting areas, or migration routes. Reduced water quality may effectively create a barrier which impedes migration upstream. The future viability of populations may be jeopardised as species are forced into sub-optimal areas to breed and/or spawn, changing their distribution and extent within and outside of the SAC. The same effects of reduced flow may also indirectly affect these species through displacement of their preferred prey. Changes in conditions as a result of reduced flow may result in the reduction of overall extent and distribution of qualifying habitats.

Likely significant effects cannot be ruled out on the River Axe SAC during the operation stage of the works. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

23.1.2 Lyme Bay and Torbay SAC

There are no infrastructure changes associated with this option, which proposes an increase in abstraction at the existing Hook Springs intake. There is no direct hydrological connection between this option and the SAC. The qualifying features of this SAC are marine habitats which are not dependent of the surface water provision from the Axe estuary and therefore will not be affected by any reduction in flow upstream during operation.

It is considered that no likely significant effects are anticipated on the Lyme Bay and Torbay SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

23.1.3 Sidmouth to West Bay SAC

There are no infrastructure changes associated with this option, which proposes an increase in abstraction at the existing Hook Springs intake. There is hydrological connectivity via the groundwater waterbody ID GB40801G802400 (East Devon – Greensand). However, this option lies outside of the SSSI IRZ associated with this SAC (Axmouth to Lyme Regis Under Cliffs SSSI) and therefore no significant effects are anticipated within the SAC boundary.

Whilst there may be an interaction between the qualifying Annex I habitat 'annual vegetation of drift lines' and surface water from the Axe estuary, this habitat is not likely to suffer from landward water quality issues and any flow will sink below beach level quickly, as detailed within the conservation objectives supplementary advice for this SAC. The other qualifying features are habitats on the top of cliffs, which do not interact with the surface water and will therefore not be affected by any reduction in flow within the upstream Axe estuary and River Kit during operation.

It is considered that no likely significant effects are anticipated on the Sidmouth to West Bay SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

23.2 Appropriate Assessment

23.2.1 Scope

The following site was assessed at Stage 2 AA:

- River Axe SAC (approximately 3.5km south-east / 4.6km downstream)

An assessment of each potential impact on the integrity of the designated site is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 23.2 below.

23.2.2 Assumptions and mitigation measures

Based on the current level of information a number of assumptions have been made, relating to principles, which will be followed during option development at the project level.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option dW2, there was no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. All waterbodies were screened out for significant effects at the Level 1 assessment. The WFD assessment concluded the confidence in the screening outcome is low, and therefore a precautionary approach has been taken to this assessment in the absence of detailed further studies. Any water transfer from the Wilmington springs must be incorporated into the RBMP and the implications of future design changes on the conservation objectives of the River Axe SAC should be assessed in accordance with the 2017 Regulations.

Table 23.2 Potential adverse effects on integrity of Habitats Sites from option dW2

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
River Axe SAC (approximately 6.7km south-east)	All	This option may have the following permanent effects on the qualifying features during operation: ● Water table availability – a reduction in flow and water level within the River Kit and subsequently River Axe due to the increased abstraction. This may affect the suitability of habitats within the SAC for supporting qualifying features. ● Toxic contamination – reduced dilution in the SAC downstream from the abstraction location, which may result in the degradation of river habitats which support qualifying features, through chemical changes as a result of reduced flow. ● Non-toxic contamination – reduced flows and water levels may lead to the degradation of river habitats which support qualifying features within the SAC, through increased suspended sediment, siltation and smothering of preferred migration routes. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in the extent and/or distribution of qualifying Annex I habitats and habitats which support qualifying species, from the changes in flow and water level. ● Biological disturbance – changes to habitat availability from the above impact pathways, leading to the displacement of these features within or from the SAC, jeopardising future spawning success, adult survival and population viability or fish species and overall extent,	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrological modelling of the proposed abstraction from the Hook springs groundwater source and its interaction with the River Kit and River Axe downstream. The operational limits of the from Hook springs that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		distribution and population sizes of qualifying features. The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		

Source: Mott MacDonald Limited, 2023

23.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following the HRA AA, no adverse effect on site integrity can be concluded for option dW2 during operation, on the understanding that further research identified in the conclusion of this Appropriate Assessment, and within the WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydro-ecology studies and hydrodynamic modelling of flows to identify whether the changes in the water levels from the increased abstraction would have an adverse effect on the quality, quantity and availability of water required to maintain the integrity of the River Axe SAC, and its qualifying features.
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential adverse effects on the River Axe SAC and its qualifying features. Future modelling will need to be refined once further information is available.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

24 dW3 Wilmington Springs Licence

24.1 Stage 1 Screening

The Stage 1 Screening identified four Habitats Sites within the ZoI of dW3 (Table 24.1). LSE could not be ruled out for one of these sites.

Information on the qualifying features and conservation objectives of the assessed Habitats Sites is provided in Appendix B**.**

Table 24.1: dW3 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
River Axe SAC (approximately 6.7km south-east)	Beer Quarry & Caves SAC (approximately 10.4km south)
	Sidmouth to West Bay SAC (11.1km south-east / 12.5km downstream)
	Lyme Bay and Torbay SAC (10.8km south / 12.7km downstream)

Source: Mott MacDonald, 2023

24.1.1 River Axe SAC

There are no infrastructure changes associated with this option, which utilises the existing Wilmington springs groundwater intake abstract water. There is no direct hydrological connection between this option and the SAC, as the Umborne Brook, the closest watercourse to Wilmington springs, joins the River Axe downstream of the SAC. This option lies outside of the SSSI IRZ associated with this SAC and therefore no significant effects are anticipated within the SAC boundary.

As a result, conclusions of no likely significant effects can be reached for the following qualifying features: rivers with floating vegetation dominated by water-crowfoot; brook lamprey and bullhead. However, significant effects cannot be ruled out for sea lamprey, a migratory fish species which travels upstream through the Axe estuary to spawn within the waters of the River Axe SAC. It is possible that during operation, the additional abstraction from Wilmington springs results in a reduced flow volume and velocity within the Umborne Brook. This may have subsequent effects on water quality downstream within the Axe estuary downstream of the SAC.

Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the habitat availability for sea lamprey. The potential loss, damage, and smothering of optimal habitats within the Axe estuary further downstream, can result in displacement of sea lamprey from preferred foraging and commuting areas, or migration routes. Reduced water quality may effectively create a barrier downstream of the River Axe SAC, impeding migration upstream to within the site boundary. The future viability of populations may be jeopardised as species are forced into sub-optimal areas to breed and/or spawn, changing their distribution and extent within and outside of the SAC. The same effects of reduced flow may also indirectly affect sea lamprey through displacement of their preferred prey.

Likely significant effects cannot be ruled out on the River Axe SAC during operation. As such this SAC has been progressed to Stage 2 Appropriate Assessment.

24.1.2 Beer Quarry & Caves SAC

There are no infrastructure changes associated with this option, which utilises the existing Wilmington springs groundwater intake abstract water. This option lies outside of the SSSI IRZ associated with this SAC and therefore no significant effects are anticipated within the SAC boundary.

As the qualifying features of this site are bats, and highly mobile, additional effects on functionally linked habitat needs to be assessed to determine potential effects. This option lies within the wider landscape connectivity zone (LCZ) of this site, as defined in the Beer Quarry & Caves SAC HRA guidance[53]. This option lies within the LCZ for lesser horseshoe and Bechstein's bat but is outside of the LCZ for greater horseshoe altogether.

Developments outside of the sustenance zones (SZ) but within the LCZ for each qualifying feature are only likely to have significant effects if they result in landscape level changes to suitable bat habitats. Reduced flow on the Umborne Brook and Axe estuary are therefore not considered to have significant effects on any of the qualifying features of the SAC.

It is considered that no likely significant effects are anticipated on the Beer Quarry & Caves SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

24.1.3 Sidmouth to West Bay SAC

There are no infrastructure changes associated with this option, which utilises the existing Wilmington springs groundwater intake abstract water. There is a hydrological connection between this option and the SAC, downstream on the Umborne Brook and Axe estuary. This connection only applies to the underpinning Axmouth to Lyme Regis Under Cliffs SSSI component of the SAC. This option lies outside of the SSSI IRZ associated with this SAC and therefore no significant effects are anticipated within the SAC boundary.

Whilst there may be an interaction between the qualifying Annex I habitat 'annual vegetation of drift lines' and surface water from the Axe estuary, this habitat is not likely to suffer from landward water quality issues and any flow will sink below beach level quickly, as detailed within the conservation objectives supplementary advice for this SAC[54]. The other qualifying features are habitats on the top of cliffs, which do not interact with the surface water and will therefore not be affected by any reduction in flow within the upstream Axe estuary and Umborne Brook during operation.

It is considered that no likely significant effects are anticipated on the Sidmouth to West Bay SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

[53] East Devon District Council, Natural England, Bat Conservation trust and East Devon AONB Partnership (2022). Beer Quarry & Caves Special Area of Conservation (SAC). Habitats Regulations Assessment Guidance October 2022 [online[available at: beer-quarry-and-caves-sac-hra-guidance.pdf (eastdevon.gov.uk)

[54] Natural England (2019). European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring site features Sidmouth to West Bay Special Area of Conservation (SAC) Site code: UK0019864. Available at: European Site Conservation Objectives for Sidmouth to West Bay SAC - UK0019864 (naturalengland.org.uk).

24.1.4 Lyme Bay and Torbay SAC

There are no infrastructure changes associated with this option, which utilises the existing Wilmington springs groundwater intake abstract water. There is no direct hydrological connection between this option and the SAC. The qualifying features of this SAC are marine habitats which are not dependent of the surface water provision from the Axe estuary and therefore will not be affected by any reduction in flow upstream during operation.

It is considered that no likely significant effects are anticipated on the Lyme Bay and Torbay SAC. On the basis of the screening assessment, it is concluded that the proposed option will have no appreciable effect on the SAC or its qualifying features and would therefore not contribute to any in-combination effects with other options, plans or projects. As such, this Habitats Site is not considered further.

24.2 Appropriate Assessment

24.2.1 Scope

The following site was assessed at Stage 2 AA:

- River Axe SAC (approximately 6.7km south-east)

An assessment of each potential impact on the integrity of the designated site is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 23.2 below.

24.2.2 Assumptions and mitigation measures

Based on the current level of information a number of assumptions have been made, relating to principles, which will be followed during option development at the project level.

It is assumed that the licence change at Wilmington springs will be granted to allow additional water to be taken over a year, which will subsequently result in the decrease in flow volume and velocity on the Umborne Brook, as assessed within this report and the WFD level 2 assessment.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option WIM4 and the 'Umborne Brook', that there would be no potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. The WFD assessment concluded the confidence in the screening outcome is low, and therefore a precautionary approach has been taken to this assessment in the absence of detailed further studies. Any water transfer from the Wilmington springs must be incorporated into the RBMP and the implications of future design changes on the conservation objectives of the River Axe SAC should be assessed in accordance with the 2017 Regulations.

Table 24.2 Potential adverse effects on integrity of Habitats Sites from option dW3

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
River Axe SAC (approximately 6.7km south-east)	Sea lamprey	This option may have the following permanent effects on sea lamprey during operation: ● Water table availability – a reduction in flow and water level within the Umborne Brook and Axe estuary due to the increased abstraction. This may affect the suitability of habitats within the Axe estuary for sea lamprey. ● Toxic contamination – reduced dilution in the functionally linked habitats which are downstream from the abstraction location, which may result in the degradation of river habitats which support sea lamprey, through chemical changes as a result of reduced flow. ● Non-toxic contamination – reduced flows and water levels may lead to the degradation of river habitats which support sea lamprey downstream, through increased suspended sediment, siltation and smothering of preferred migration routes. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in the extent and/or distribution of habitats which support sea lamprey, from the changes in flow and water level. ● Biological disturbance – changes to habitat availability from the above impact pathways, leading to the displacement of these features within functionally linked habitat and jeopardising future spawning success, adult survival and population viability.	Appropriate mitigation measures for sea lamprey during operation will be informed by completion of further assessments, including hydrological modelling of the proposed abstraction from the Wilmington springs groundwater source and its interaction with the Umborne Brook. The operational limits of the from Wilmington springs that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying species.		
	Rivers with floating vegetation dominated by water-crowfoot Brook lamprey Bullhead	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.

Source: Mott MacDonald Limited, 2023

24.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following the HRA AA, no adverse effect on site integrity can be concluded for option WIM4 during operation, on the understanding that further research identified in the conclusion of this Appropriate Assessment, and within the WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydro-ecology studies and hydrodynamic modelling of flows to identify whether the changes in the water levels from the increased abstraction would have an adverse effect on the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites within the ZoI, and their qualifying features.
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential adverse effects on the functionally linked habitat for sea lamprey associated with the River Axe SAC, within the ZoI. Future modelling will need to be refined once further information is available.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

25 dW4 Wimbleball not releasing compensation flows when making supply releases

25.1 Stage 1 Screening

The Stage 1 Screening identified three Habitats Sites within the ZoI of dW4 (Table 25.1). LSE could not be ruled out for any of these three sites.

Information on the qualifying features of the assessed Habitats Sites is provided in Appendix A.

Table 25.1: dW4 Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
Exe Estuary SPA (approximately 7.1km south-east / 7.7km downstream)	
Exe Estuary Ramsar (approximately 7.1km south-east / 7.7km downstream)	
Dawlish Warren SAC (approximately 17.8km south-east / 18.8km downstream)	

Source: Mott MacDonald, 2023

25.1.1 Exe Estuary SPA

There are no infrastructure changes associated with this option, which is assumed to use an existing intake at Pynes WTW to abstract the compensation flow released from Wimbleball Lake into the River Exe during drought conditions. The SPA is hydrologically connected downstream of the option via the River Exe.

During operation, increased abstraction of the compensation flow may result in a reduced flow on the River Exe downstream of this location, possibly resulting in the degradation of habitats which support qualifying features. A general reduction in water table availability within the Exe valley could affect important habitats which support qualifying features, such as saltmarsh and mudflats further downstream.

Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for the colonisation of saltmarsh and mudflat pioneer species, such as excessive nutrient loading. This will subsequently result in reductions in habitat and prey availability for qualifying features, potentially displacing them from preferred foraging and roosting areas within the SPA. This may jeopardise over winter survival and future breeding success, leading to changes in the extent, distribution and future viability of populations sizes associated with the SPA.

Likely significant effects cannot be ruled out on the Exe Estuary SPA during the operation stage of the option. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

25.1.2 Exe Estuary Ramsar

The hydrological connection between this option and the Ramsar is the same as described for the Exe Estuary SPA above. The same impact pathways are present during operation, due to the identical extent of the site boundaries and considerable overlap in qualifying features.

Likely significant effects cannot be ruled out on the Exe Estuary Ramsar during the operation stage of the option. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

25.1.3 Dawlish Warren SAC

This site is hydrologically connected downstream of the option via the River Exe. During operation, increased abstraction of the compensation flow may result in a reduced flow on the River Exe downstream of this location, possibly resulting in the degradation of qualifying habitats, and habitats which support petalwort *Petalophyllum ralfsii*. A general reduction in water table availability within the Exe valley could affect these habitats, despite their distance downstream.

Reduced flows can lead to increased turbidity, sedimentation and siltation within the water column, which ultimately reduces the water quality, potentially resulting in conditions which are no longer suitable for the colonisation of pioneer dune species, such as excessive nutrient loading. This will subsequently result in reductions qualifying habitats and petalwort, potentially resulting in changes to overall extent, distribution and population size (petalwort only) within the SAC boundary.

Significant effects are only anticipated on 'humid dune slacks' and petalwort. Changes to water quality and hydrological regime are not considered to be relevant to the 'shifting dunes with marram' and 'fixed dunes with herbaceous vegetation' Annex I habitats[55].

Likely significant effects cannot be ruled out on the Dawlish Warren SAC during the operation stage of the option. As such this Habitats Site has been progressed to Stage 2 Appropriate Assessment.

25.2 Appropriate Assessment

25.2.1 Scope

The following sites were assessed at Stage 2 AA:

- Exe Estuary SPA (approximately 7.1km south-east / 7.7km downstream)
- Exe Estuary Ramsar (approximately 7.1km south-east / 7.7km downstream)
- Dawlish Warren SAC (approximately 17.8km south-east / 18.8km downstream)

An assessment of each potential impact on the integrity of the designated site is made, in view of the sites' structure, function and conservation objectives. Potential adverse effects on the integrity of the Habitats Sites are outlined in Table 22.2 below.

25.2.2 Assumptions and mitigation measures

Based on the current level of information a number of assumptions have been made, relating to principles, which will be followed during option development at the project level.

[55] Natural England (2019). European Site Conservation Objectives for Dawlish Warren SAC (UK0030130). Available at: European Site Conservation Objectives for Dawlish Warren SAC - UK0030130 (naturalengland.org.uk)

It is assumed that the intake location for abstraction of the compensation flow is at Pynes WTW, as this is where the abstracted water will be treated before distribution.

The WFD assessment to inform the updated dWRMP24 concluded, in relation to option dW4 and the 'Exe (Culm to Creedy)', that there may be potential for a widespread or prolonged effect on the quality of the water environment that may result in the temporary reduction in WFD status and the potential to prevent target WFD objectives from being achieved. The WFD assessment concluded the confidence in the screening outcome is low, and therefore a precautionary approach is taken for this assessment; additional studies are required before a conclusion into the potential adverse effects during construction is possible. Any water transfer from the River Exe must be incorporated into the RBMP and the implications of future design changes on the conservation objectives of the Exe Estuary SPA, Exe Estuary Ramsar and Dawlish Warren SAC should be assessed in accordance with the 2017 Regulations.

Table 25.2 Potential adverse effects on integrity of Habitats Sites from option dW4

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
Exe Estuary SPA (approximately 7.1km south-east / 7.7km downstream)	All	This option may have the following permanent effects on the qualifying features during operation: ● Water table availability – a reduction in flow and water level downstream within the SPA due to the increased groundwater abstraction upstream. This may affect both the surface water and groundwater resulting in degradation of habitats which support qualifying features. ● Toxic contamination – reduced dilution in the SPA downstream, which may result in the degradation of habitats which support qualifying features. ● Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of supporting habitats. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in supporting habitats' extent and/or distribution from the impact pathways above. ● Biological disturbance - changes to habitat availability from the above impact pathways, leading to the displacement of qualifying features within or from the SPA and jeopardising adult survival and population viability associated with the SPA. The effects of toxic contamination, non-toxic contamination and physical loss or damage of qualifying habitats during construction could be permanent impacts but are likely to be localised.	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the River Exe. The operational limits of the abstraction from the River Exe that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects.

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		The identified effects have the potential to reduce the distribution, extent and population sizes of qualifying features.		
Exe Estuary Ramsar (approximately 7.1km south-east / 7.7km downstream)	All	See “Possible adverse effects before mitigation” listed above for all features of the Exe Estuary SPA.	See “Indicative mitigation measures” listed above for all features of the Exe Estuary SPA.	No adverse effects.
Dawlish Warren SAC (approximately 17.8km south-east / 18.8km downstream)	Humid dune slacks Petalwort	This option may have the following permanent effects during operation: ● Water table availability – a reduction in flow and water level within the SAC due to the increased groundwater abstraction upstream. This may affect the hydrological regime, resulting in degradation of qualifying habitats and habitats which can support petalwort. ● Toxic contamination – reduced dilution in the SAC downstream, which may result in the degradation of qualifying habitats, and those habitats which can support petalwort populations. ● Non-toxic contamination – reduced flows and water levels may lead to changes in turbidity and sedimentation, increasing silt deposition and smothering of qualifying habitats. Nutrient enrichment of the watercourse which supports the qualifying features, caused by reductions in flow and water levels. ● Physical loss and/or damage – significant localised habitat degradation or loss leading to a reduction in qualifying habitats’ extent and/or distribution from the impact pathways above. Reductions is populations sizes, extent and distribution of petalwort as a result.	Appropriate mitigation measures during operation will be informed by completion of further assessments, including hydrogeological modelling of the proposed increased abstraction from the Permian Aquifers in Central Devon and its interaction with the River Exe. The operational limits of the abstraction from the Permian Aquifers in Central Devon, and discharge to the River Exe, that will be imposed by the updated South West RDB RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity during operation.	No adverse effects

Habitats Sites	Qualifying features	Possible adverse effects before mitigation	Mitigation measures	Possible adverse effects after mitigation
		The identified effects have the potential to reduce the distribution and extent of qualifying Annex I habitats and reduce the distribution, extent and population sizes of petalwort.		
	Shifting dunes with marram Fixed dunes with herbaceous vegetation	There are no impact pathways identified for these qualifying features. Therefore, no adverse effects are anticipated.	None required.	No adverse effects.

Source: Mott MacDonald Limited, 2023

25.2.3 Stage 2 Appropriate Assessment outcomes and recommendations

Following this HRA AA, no adverse effect on site integrity can be concluded for option dW4 during operation, on the understanding that further research identified in the conclusion of this Appropriate Assessment, and within the WFD assessment, on the potential environmental effects of future design iterations (including the use of alternative water transfer operating procedures or water sources), will lead to a final project that will operate in compliance with the legally binding environmental objectives set out in the RBMP. The operational limits that will be imposed by the RBMP are a sufficient safeguard for this plan-level assessment to conclude no adverse effect on site integrity.

In accordance with the National Planning Policy Framework, the development and implementation of the Option should promote the conservation, restoration and enhancement of the Habitats Sites identified within the ZoI and the protection and recovery of qualifying species as well as identify and pursue opportunities for securing measurable net gains for biodiversity.

The recommended mitigation measures detailed within this document assume a worst-case scenario at this stage, in the absence of detailed survey data or local records. It is anticipated that, at the project level, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Hydrogeological studies and hydrodynamic modelling of flows to identify whether the changes in the water levels from the increased abstraction would have an adverse effect on the base flow of the River Exe, and subsequently the quality, quantity and availability of water required to maintain the integrity of any of the Habitats Sites within the ZoI, and their qualifying features. Specific abstraction conditions and adjustment of existing licences may also be required.
- Further modelling of sedimentation and nutrient concentrations are required to determine the potential adverse effects on the Exe Estuary SPA, Exe Estuary Ramsar and Dawlish Warren SAC downstream of the increased abstraction from the River Exe, within the ZoI. Future modelling will need to be refined once further information is available.
- Finally, the adverse effects identified through this HRA may be compounded through the more frequent and intense effects of climate change, including heat waves, droughts, and floods. Therefore, a climate change scenario analysis is also recommended to account for mid and long-term effects on the Habitats Sites.

It should be noted that the conclusions contained in this document are based on preliminary, indicative design assumptions available at this time and are primarily informed by available, appropriate desktop information. Further design iterations will require revisions to this document and may result in changes to the current conclusion.

26 In-combination assessment

This in combination assessment aims to identify where the updated dWRMP24 is likely to interact with other plans and projects at a strategic scale and determined the degree to which such interaction may lead to adverse effects on Habitats Sites. An in-combination assessment was undertaken for those supply options which are identified in the current BVP, alternative plans and adaptive pathways, and those which have been fully assessed. This means that supply option WIM18, included within all plans and adaptive pathways except 'Least Cost', has not been included within the in-combination assessments. As such, the following options are relevant to the in-combination assessment for the BVP (and Best Environment & Society Plan and Ofwat Core Pathway plan which are identical):

- BNW1 Borehole development, existing borehole remedial works
- BNW6 Longham Aquifer Recharge
- BNW7 Mendips Quarry – Raw water transfer and augmentation of the River Stour
- BNW8 Poole Harbour FE-reuse
- BNW14 Ibsley Lake
- COL15 Restormel WTW – increase treatment capacity to 110 Ml/dMl/d
- ROA21 Roborough to Littlehempston WTW
- WIM14 Whitecross Distribution Upgrade
- WIM18 Cheddar 2 to Bickham Moor - New Strategic Regional Reservoir, Treatment and Transfer
- dW1 Brampford Speke and Stoke Canon (North Exeter Boreholes)
- dW2 Hook Springs Licence
- dW3 Wilmington Springs Licence
- dW4 Wimbleball not releasing compensation flows when making supply releases

The following options are relevant to the in-combination assessment for the Least Cost plan:

- BNW7 Mendips Quarry – Raw water transfer and augmentation of the River Stour
- BNW8 Poole Harbour FE-reuse
- ROA21 Roborough to Littlehempston WTW
- WIM5 Indirect potable reuse - stream support for Dotton WTW
- WIM11 Couchill Springs, Seaton
- WIM12 Allers Springs
- WIM14 Whitecross Distribution Upgrade
- dB1 Wimborne Borehole
- dB2 Stanbridge Licence
- dW1 Brampford Speke and Stoke Canon (North Exeter Boreholes)
- dW2 Hook Springs Licence
- dW3 Wilmington Springs Licence
- dW4 Wimbleball not releasing compensation flows when making supply releases

The following options are relevant to the in-combination assessment for the Adaptive Pathway - Medium:

- BNW1 Borehole development, existing borehole remedial works

- BNW6 Longham Aquifer Recharge
- BNW7 Mendips Quarry – Raw water transfer and augmentation of the River Stour
- BNW8 Poole Harbour FE-reuse
- BNW14 Ibsley Lake
- COL15 Restormel WTW – increase treatment capacity to 110 Ml/dMl/d
- COL22 Roadford to Colliford via Saltash
- ROA7 Expansion of Northcombe WTW to 60 Ml/dMl/d
- ROA17 Littlehempston WTW
- ROA21 Roborough to Littlehempston WTW
- WIM5
- WIM14 Whitecross Distribution Upgrade
- WIM18 Cheddar 2 to Bickham Moor - New Strategic Regional Reservoir, Treatment and Transfer
- dW1 Brampford Speke and Stoke Canon (North Exeter Boreholes)
- dW2 Hook Springs Licence
- dW3 Wilmington Springs Licence
- dW4 Wimbleball not releasing compensation flows when making supply releases

All options within the Adaptive Pathway – Medium are also included within the Adaptive Pathway – High, although the following are also included within Adaptive Pathway – High in addition to the above:

- WIM2 Sidford borehole commissioning
- WIM11 Couchill Springs, Seaton
- WIM12 Allers Springs

Further assessments will be undertaken on supply option WIM18 as part of the option development.

There is confidence that the measures detailed in this plan level assessment can avoid and mitigate for all potential effects and therefore bearing in mind these findings, adverse in-combination effects are not anticipated.

GIS was used to identify any plans and strategic projects that interacted with receptors affected by one or more options included in the updated dWRMP24. GIS was not available for the SRO options, BNW7, BNW8 and any of the drought options, so any interactions were identified through other means.

Strategic plans and projects identified that may interact with the updated dWRMP24 are:

- River Basin Management Plans (RBMPs)
- Marine plans
- South West Water's Drought Plan
- South West Water's Drainage and Waste Water Management Plans
- Other water company draft WRMPs
- Large existing and emerging Local Plan housing allocations
- NSIPs listed on the Planning Inspectorate's Website
- Hybrid Bills
- Transport and Works Act Orders for large-scale transport infrastructure
- Minerals and waste applications, including for landfill and energy from waste projects

In terms of the sustainable management of water quantity and quality, WRMPs and RBMPs contain similar objectives. Marine plans have complementary objectives to RBMPs, with an overall objective to achieve 'Good Environmental Status' in marine waters, including the same objectives for good ecological and chemical status. All local development plans use RBMPs and where relevant marine plans to inform the planning policies, forming a complimentary approach to delivering the objectives of the RBMPs and marine plans.

Any interactions with other plans are only likely to affect water dependent Habitats Sites with respect to RBMPs, and coastal/estuarine habitats sites with respect to marine plans. WRMPs are identified within the RBMPs as plans to work alongside the RBMP to address pressures on water body status and meet specific plan level objectives. WRMPs and the options arising from them should therefore act as mechanisms to deliver RBMP objectives for water dependent Habitats Sites. Similarly for coastal/estuarine Habitats Sites, WRMPs and the options arising from them should act as mechanisms to deliver the sustainable development objectives of the marine plans they interact with.

Although there is current uncertainty regarding the timing construction and implementation of other development activities, it is assumed that generic mitigations will be put in place in accordance with the respective policy framework set out in emerging plans and within planning conditions and requirements. Therefore, taking in the specific findings of this HRA set out above, no adverse effect on the integrity of any Habitats Sites is anticipated from in-combination effects.

27 Next Steps

It is considered that at the plan level (BVP, alternatives and adaptive pathways) there is confidence that adverse effects can be avoided or fully mitigated through adjustments to the detailed design of the scheme and the application of measures described in the individual option assessments (Sections 4 – 25). Following the external completion of the SRO option WIM18 a review of cumulative effects will be required, in order to summarise the potential significant effects and/or adverse effects on integrity which arise from the proposed development. This will also enable this option to be included within the in-combination assessments for those plans and adaptive pathways for which it has been included.

The plan level measures will be delivered at the project level using the following principles:

- An engagement plan will set out the expectations and timescales of consultation so that stakeholders can provide advice during the design and consenting processes.
- Option design and the development of measures to safeguard the Habitats Sites will be informed by further research, including the studies recommended within individual supply option's conclusions.
- In planning the location of infrastructure, the emphasis should be on avoiding Habitats Sites. If this is not possible, adverse effects must be minimised through design, so they are no longer significant. If avoidance is not possible then this must be clearly justified, including reasons why alternative locations, either inside and/or outside the Habitats Site, are unsuitable.
- Where it is necessary to minimise adverse effects of infrastructure at the project level, appropriate measures should ideally be agreed with statutory stakeholders and be capable of being secured within project design and/or consents. Mitigation measures will also need to be acceptable to competent authorities.
- 'Best available techniques' (BAT) for preventing or minimising impacts on the environment. Consideration of BAT will include the use of technology and design, as well as construction, operation, maintenance and decommissioning methods.
- Current best practice environmental considerations, guidance and advice from statutory nature conservation bodies (e.g. Natural England) will be taken into account during the detailed design process.
- Planning of infrastructure should be undertaken in consultation with key stakeholders (e.g. Natural England and, where appropriate, Joint Nature Conservation Committee (JNCC)). Other non-statutory consultees should also be included in the consultation.

Further studies will need to be carried out ahead of applications for planning permission/development consent for individual projects. These studies will be used to inform the HRA undertaken at project level. Consultation with Natural England can be undertaken to define the scope and objectives of these investigations for the different options.

The investigations will need to be undertaken by SWW, in partnership with other organisations. The investigations will require more detail on the design, construction and likely operational activities of the supply options included within the BVP, alternative plans and adaptive pathways. To facilitate the assessment the investigations are very likely to need to gather new data and may require new research to be conducted in relation to the Habitats Sites. The environmental scope of the investigations should focus on the qualifying features having regard to the contents of this HRA and should ensure the precautionary principle is applied. At the plan level, it is concluded that there will be no adverse effect on the integrity of any Habitats Site.

A. Legislation

A.1 The Directives

Under the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, commonly referred to as "the Habitats Directive" (Council Directive 92/43/EEC), Member States are required to take special measures to maintain the distribution and abundance of certain priority habitats and species (listed in Annexes I and II of the Directive). Each Member State is required to designate the most suitable sites as SACs. All such SACs will form part of the Natura 2000 network under article 3(1) of the Habitats Directive.

Article 2(3) sets out that Member States have a duty, in exercising their obligations under the Habitats Directive, to:

".. take account of economic, social and cultural requirements and local characteristics."

There is an obligation under the Habitats Directive for Member States to designate sites before turning to measures for their protection.

Article 6(2) requires Member States to take appropriate steps to avoid the deterioration of natural habitats and disturbance of species for which the sites have been designated, in so far as the disturbance could be significant in relation to the objectives of the Directive. Article 6(3) and Article 6(4) require that a plan or project not directly connected with the management of the site, but likely to have a significant effect upon it, either individually or in combination with other plans or projects, must be subject to an appropriate assessment of its implications on the site, in view of the sites conservation objectives.

Having undertaken an appropriate assessment, the competent authority may agree to a plan or project where it can be concluded that it will not adversely affect the integrity of the designated site. In light of a negative assessment on the implications for the integrity of the site, Article 6(4) provides that the plan or project may still proceed where it can be demonstrated that there are no alternatives and there are imperative reasons of over-riding public interest as to why it must proceed. In the event that a plan or project is to proceed on the basis of imperative reasons of over-riding public interest, by direction of Article 6(4), compensatory measures must be put in place to ensure that the overall coherence of the Natura 2000 network is protected.

A.2 The 2017 Regulations

The 2017 Regulations transpose the requirements of the Habitats Directive into UK legislation. The Habitats Regulations aim to protect a network of sites that have rare or important habitats and species in order to safeguard biodiversity.

Under the Habitats Regulations, Competent Authorities have a duty to ensure that all the activities they regulate have no adverse effect on the integrity of any of the Natura 2000 sites. Regulation 63 of the Habitats Regulations 2017 requires that:

"63(1) A competent authority before deciding to undertake, or give any consent, permission or other authorisation for a plan or project, which: -

(a) is likely to have a significant effect on a European site in Great Britain (either alone or in combination with other plans or projects) and

(b) is not directly connected with or necessary for the management of the site,

shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

…

63(5) In light of the conclusions of the assessment, and subject to regulation 64, the authority shall agree to a plan or project only after having ascertained that it will not adversely affect the integrity of the European site.

…

63(6) In considering whether a plan or project will adversely affect the integrity of the site, the authority shall have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given.

…"

Regulation 63 of the 2017 Regulations therefore sets out a two-stage process. The first test is to determine whether the plan / project is likely to have a significant effect on the European site, the second test (if applicable) is to determine whether the plan / project will affect the integrity of the European site.

A.3 Guidance and other relevant documents

A.3.1 Natura Standard Data Forms

A standard reporting format has been developed for Natura 2000 sites (SACs and Special Protection Areas – SPAs) to ensure that the relevant site selection information is reported and stored in a consistent manner that can be easily made available.

A standard reporting form for SPAs and SACs was developed by the European Commission and published in 1996. The form is used for all sites designated or proposed to be designated as SPAs and SACs under the relevant Directives, with the information to be stored on a central database.

Article 4 of the Habitats Directive provides the legal basis for providing the data. Article 4 states that information shall include a map of the site, its name, location, extent and the data resulting from application of the criteria specified in Annex III and that this shall be provided in a format established by the Commission.

Whilst it is the relevant country agency *Natural England) that is responsible for designating a site, it is the JNCC who are responsible for collating the lists of European and international designated sites, together with relevant supporting information. The Natura 2000 Data Forms for SPAs and SACs are therefore made available by the JNCC.

Within the explanatory notes for Natura Standard Data Forms (European Commission 1996) the following "main objectives" of the Natura data form / database are given:

1. *"to provide the necessary information to enable the Commission, in partnership with the Member States, to co-ordinate measures to create a coherent NATURA 2000 network and to evaluate its effectiveness for the conservation of Annex I habitats and for the habitats of species listed in Annex II of Council Directive 92/43/EEC as well as the habitats of Annex I bird species and other migratory bird species covered by Council Directive 79/409/EEC."*
2. *"to provide information which will assist the Commission in other decision making capacities to ensure that the NATURA 2000 network is fully considered in other policy*

areas and sectors of the Commission's activities in particular regional, agricultural, energy, transport and tourism policies."

3. *"to assist the Commission and the relevant committees in choosing actions for funding under LIFE and other financial instruments where data relevant to the conservation of sites, such as ownership and management practice, are likely to facilitate the decision making process."*
4. *"to provide a useful forum for the exchange and sharing of information on habitats and species of Community interest to the benefit of all Member States."*

A.3.2 Communication from the Commission on the Precautionary Principle (2000)

Enshrined within the Habitats Directive and Regulations (though not explicitly set out in either), based upon article 191 of the Treaty on the Functioning of the European Union, is the need to have due regard to the Precautionary Principle when assessing the risks posed to the integrity of the site(s). If a risk of significant effect to the integrity of a site cannot be excluded on the basis of objective information, then the application of the precautionary principle requires no consent to be given for such a project.

The document titled "Communication from the Commission on the Precautionary Principle" (2000) provides useful guidance in relation to the application of the Precautionary Principle in relation to European sites issues. Paragraph 6, sets out the six key matters for consideration when applying the Precautionary Principle. Paragraph 6 states:

- *"Where action is deemed necessary, measures based on the precautionary principle should be, inter alia:*
- *proportional to the chosen level of protection,*
- *non-discriminatory in their application,*
- *consistent with similar measures already taken,*
- *based on an examination of the potential benefits and costs of action or lack of action (including, where appropriate and feasible, an economic cost/benefit analysis),*
- *subject to review, in the light of new scientific data, and*
- *-capable of assigning responsibility for producing the scientific evidence necessary for a more comprehensive risk assessment."*

Under these bulleted points, the guidance gives specific definitions in relation to each of the above, with further detail provided within Section 6.

A.3.3 Managing Natura 2000 Sites (European Communities 2000)

The document entitled "Managing Natura 2000 Sites the provisions of article 6 of the Habitats Directive 92/43/CEE", published by the European Commission in 2000, provides guidelines to the Member States on the interpretation of certain key concepts used in Article 6 of the Habitats Directive. It should be noted that the Section relating to Article 6(4) has subsequently been replaced through the publication of a further guidance document by the European Commission in 2007 entitled "Guidance document on Article 6(4) of the 'Habitats Directive', which is considered below under the relevant heading.

This document states in Section 2.3.3 that conservation measures must correspond to the ecological requirements of the habitats and species present for which the site is designated and that these requirements *"involve all the ecological needs necessary to ensure their favourable conservation status".*

In Section 3.5 the guidance states, in relation to deterioration and disturbance of habitats or species:

"Deterioration or disturbance is assessed against the conservation status of species and habitats concerned. At a site level, the maintenance of the favourable conservation status has to be evaluated against the initial conditions provided in the Natura 2000 standard data forms when the site was proposed for selection or designation, according to the contribution of the site to the ecological coherence of the network. This notion should be interpreted in a dynamic way according to the evolution of the conservation status of the habitat or the species."

Section 4.4.1 sets out that in determining what may constitute a likely 'significant' effect one should take into account the conservation objectives for the site and other relevant baseline information. In the second paragraph of this section of the document it is stated:

"In this regard, the conservation objectives of a site as well as prior or baseline information about it can be very important in more precisely identifying conservation sensitivities."

Section 4.5.3 of the document sets out the duty of Member States to provide certain specific information in support of the inclusion of a site within the Natura 2000 network. This information is to be provided in a format specified by the European Commission (the Natura 2000 Standard Data Form).

A link is drawn between the Standard Data Form and the formation of the sites conservation objectives within the text box at the end of Section 4.5.3 of the guidance where it is stated:

"The information provided according to the standard data form established by the Commission forms the basis for a Member State's establishment of the site's conservation objectives."

With regard to an assessment of the effects of a plan / project on the integrity of a site, the 'integrity of the site' is defined in Section 4.6.3 as:

"… the coherence of the site's ecological structure and function, across the whole area, or the habitats, complex of habitats and / or populations of species for which the site is or will be classified."

The guidance is clear, within the text box at the foot of page 39, that an assessment as to the implications of the plan / project on the integrity of the site should be limited to an assessment against the sites' conservation objectives:

"The integrity of the site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives."

Section 5 of the document deals with Article 6(4) of the Habitats Directive. Note that this section has been expanded upon and replaced by further guidance issued by the European Commission entitled "Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC" (2007).

A.3.4 Assessment of Plans and Projects Significantly Affecting Natura 2000 sites Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission 2001)

This document, published by the European Commission in 2001, gives guidance on carrying out and reviewing those assessments required under Article 6(3) and (4) of the Habitats Directive. It is provided as supplementary guidance and does not over-ride or replace any of that set out within Managing Natura 2000 (European Commission 2000) which as stated at page 6 of the document, "*is the starting point for the interpretation of the key terms and phrases contained in the Habitats Directive*". The guidance provided is not mandatory and it is clearly set out that its use is "optional and flexible" and that it is for "*Member States to determine the procedural requirements deriving from the directive*".

The guidance sets out the key stages in following the tests contained within the Habitats Directive. Pertinent to this assessment of the Best Value Plan, alternative plans and adaptive pathways, stages one and two are relevant. Stage one is the screening stage assessing the likelihood of a plan / project resulting in a significant effect upon the European site. The second comprises the appropriate assessment.

Section 3.2.4 is concerned with Appropriate Assessment and specifically, the assessment against the conservation objectives of the European Site. Box 9 provides a list of five example conservation objectives for differing broad habitat types. One such example, that for a coastal site, taken from Box 9 is provided below:

"to maintain the status of the European features of this coastal site in favourable condition, allowing for natural change. Features include coastal shingle vegetation and lagoons (within a candidate special area of conservation (SAC), which is also an SPA). "

A.3.5 Common Standards Monitoring (JNCC February 2004)

Common Standards Monitoring is a means by which condition objectives for habitats, species, or other features of designated sites (e.g. SSSIs and SPAs) are set based on key attributes of the features.

The JNCC and the country Conservation Agencies (e.g. NE) developed guidance on the setting and assessment of condition objectives, as required under the Birds and Habitats Directives and set out a framework for this in 1999. This framework is provided in the form of Common Standards Monitoring ("CSM") guidance which comprises a suite of documents including an "Introduction to the Guidance Manual on Common Standards Monitoring" and several species/habitat specific documents. The Introduction to the Guidance Manual covers various relevant concepts and terms. It also provides a background to the setting of conservation objectives and sets out the desired approach to setting targets, monitoring, management and reporting on conservation measures in designated sites.

The Introduction to the CSM Guidance and CSM guidance for individual site attributes, sets out specific criteria regarding the identification of interest features, targets and methods of assessment. There is in-built flexibility and allowances for 'judgements to be made' when assessing, for example, favourable condition.

It is understood that NIEA applies the Common Standards Monitoring approach to European designated sites through an assessment of the SSSI condition. This is undertaken on a cycle of approximately 6 years. The assessment does not relate to the Conservation Objectives of the European site but provides a tool for tailoring future management of the SSSI such that favourable condition of the interest features can be maintained or restored as appropriate.

A.3.6 Guidance document on Article 6(4) of the 'Habitats Directive' (European Commission 2007)

This document, published by the European Commission in 2007, is intended to provide clarification on key terms / concepts as referred to within "Managing Natura 2000 Sites" and replaces the section on Article 6(4) within that earlier document.

The Guidance document covers, in particular, the concepts of Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensation Measures, Overall coherence and the Opinion of the Commission. With regard to ensuring the quality of an appropriate assessment, and to define exactly what needs to be compensated, it is stated in Section 1.3 that:

"Assessment procedures of plans or projects likely to affect Natura 2000 sites should guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the network, both in the definition of the baseline conditions and in the stages leading to

identification of potential impacts, mitigation measures and residual impacts. These determine what has to be compensated, both in quality and quantity."

The need to use information contained within the Natura Standard Data Form, in tandem with the sites conservation objectives, when undertaking an appropriate assessment is specifically referred to (under the second hyphenated point in Section 1.3 on page 5).

Section 1.3.2 gives guidance on the application of Article 6(4) in respect of reasons of overriding public importance and Section 1.4.1 gives guidance on the application of Article 6(4) in respect of compensatory measures.

A.3.7 Managing Natura 2000 Sites – The provisions of Article 6 of the habitats Directive 92/43/EEC

In January 2019 the European Commission published updated guidance in relation to managing Natura 2000 sites, following initial guidance published in 2000 (see above).

The primary purpose of the revision was to incorporate relevant rulings of the Court of Justice of the European Union (EU) which have been issued since the initial guidance was published in 2000. It also integrates, into a single document, other relevant European Commission notes / guidance documents. Those key rulings (of the Court of Justice of the EU) and other relevant European Commission notes / guidance are discussed above in this report. The revised guidance provides clarifications of key concepts to Member State, authorities and stakeholders involved in the management of Natura 2000 sites (e.g. SPAs and SACs).

A.3.8 Conservation Objectives

Whilst Regulation 63 of the Habitats Regulations is explicit in setting out that any assessment of the implications of the plan/project on a European designated site should be undertaken in view of the site's "conservation objectives", the term 'conservation objective' is not explicitly defined within the Regulations. The term "conservation objectives" appears at Article 6(3) of the Habitats Directive which sets out the process of assessment for a plan or project which may be likely to have an effect on a designated site, however the term itself is not defined.

To understand what is meant by the term "conservation objective" it is necessary to look at the Habitats Directive in light of relevant European and other guidance. That guidance is not always consistent or clear about the use of the term "conservation objectives". For the purposes of this assessment, reference is made to the formal "conservation objectives" mentioned in Article 6(3) and Regulation 63 as "Conservation Objectives".

The term "conservation" is defined within the Habitats Directive at Article 1(a):

"conservation means a series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favourable status as defined in (e) and (i)".

The term "conservation status of a natural habitat" is defined within the Habitats Directive at Article 1(e):

"conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2."

The term "conservation status of a species" is defined within the Habitats Directive at Article 1(i):

"conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2:

The conservation status will be taken as 'favourable' when:

- *Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
- *The natural range of the species is neither being reduced nor is it likely to be reduced for the foreseeable future, and*
- *There is and will probably continue to be a sufficiently large habitat to maintain its populations on a long-term basis."*

Article 3 of the Habitats Directive sets out that Member States have a duty to designate (in accordance with Article 4 of the Directive) special areas of conservation and that where necessary Member States shall endeavour to improve the ecological coherence of Natura 2000.

Article 4(1) of the Habitats Directive states that Member States must provide a list of sites, indicating which Annex I habitats and species occurring on Annex II are present. This Article also clarifies the type of information that must be submitted for each listed site (map, name, location, extent and the results of the application of qualification criteria listed at Annex III of the Directive). This information provides the basis of the Natura 2000 Data Form discussed elsewhere within this document. Article 4(4) states:

"Once a site of Community importance has been adopted in accordance with the procedure laid down in paragraph 2, the Member State concerned shall designate that site as a special area of conservation as soon as possible within six years at most, establishing priorities in the light of the importance of the sites for the maintenance or restoration, at a favourable conservation status, of a natural habitat type in Annex 1 or a species in Annex 2 and for the coherence of Natura 2000, and in the light of the threats of degradation or destruction to which those sites are exposed."

Full regard has been had to the significant weight to be applied to the formal Conservation Objectives when considering a plan or project and applying the tests of the Habitats Regulations. Regard has also been had to other relevant information including that available from the JNCC.

A.3.9 Summary

The above legal framework and guidance documents have been used by the Authors of this HRA in determining the effects of both the individual elements of the Plan and the Plan as a whole. In doing so the judgements made rely on the baseline information currently available and the information regarding the nature of the proposals at this the Plan making stage.

B. Habitats Sites' Qualifying Features and Conservation Objectives

B.1 BNW1 Borehole development, existing borehole remedial works

Habitats Sites	Qualifying Features	Conservation Objectives
The New Forest SAC (UK0012557)	Annex I habitats (primary reason for site selection): 3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-nanojuncetea 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 7150 Depressions on peat substrates of the Rhynchosporion 9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (Quercion robori-petraeae or Ilici-Fagenion 9130 Asperulo-Fagetum beech forests 9190 Old acidophilous oak woods with *Quercus robur* on sandy plains 91D0 Bog woodland *priority feature 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Silicion albae) *priority feature Annex I habitats present as a qualifying feature, but not primary reason for selection: 7140 Transition mires and quaking bogs 7230 Alkaline fens Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale* 1083 Stag beetle *Lucanus cervus*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; ● The extent and distribution of qualifying natural habitats and habitats of qualifying species ● The structure and function (including typical species) of qualifying natural habitats ● The structure and function of the habitats of qualifying species ● The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely ● The populations of qualifying species, and, ● The distribution of qualifying species within the site.

Habitats Sites	Qualifying Features	Conservation Objectives
	Annex II species present as a qualifying feature, but not primary reason for selection: 1166 Great crested newt *Triturus cristatus*	
New Forest SPA (UK9011031)	Article 4.1 qualification: During the breeding season the area regularly supports: Nightjar *Caprimulgus europaeus* (8.8% of the GB population) Woodlark *Lullula arborea* (29.5% of the GB breeding population) Honey buzzard *Pernis apivorus* (12.5% of the GB breeding population) Dartford warbler *Sylvia undata* (33.6% of the GB breeding population) Over the winter the area regularly supports: Hen harrier *Circus cyaneus* (2% of the GB population) Article 4.2 qualification: During the breeding season the area regularly supports: Hobby *Falco subbuteo* (5% of the GB population) Wood warbler *Phylloscopus sibilatrix* (at least 2% of the GB population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
New Forest Ramsar (UK11047)	Ramsar criterion 1: Valley mires and wet heaths are found throughout the site and are of outstanding scientific interest. This is the largest concentration of intact valley mires of their type in Britain. Ramsar criterion 2: The site supports a diverse assemblage of wetland plants and animals including several nationally rare species. Seven species of nationally rare plants are found on site, as are at least 65 British Red Data Book invertebrate species. Ramsar criterion 3: The mire habitats are of high ecological quality and diversity and have undisturbed transitional zones. The invertebrate fauna of the site is important due to the concentration of rare and scarce wetland species. The whole site complex, with its examples of semi-natural habitats is essential to the genetic and	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SPA and SAC designations will be, in most cases, sufficient to support the management of the Ramsar interests.

Habitats Sites	Qualifying Features	Conservation Objectives
	ecological diversity of southern England. This site contains a rich invertebrate fauna.	
Solent Maritime SAC (UK0030059)	Annex I habitats (primary reason for selection): 1130 Estuaries 1320 Spartina swards (Spartinion maritimae) 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Annex I habitats present as a qualifying feature, but not primary reason for selection: 1110 Sandbanks which are slightly covered by sea water all the time 1140 Mudflats and sandflats not covered by seawater at low tide 1150 Coastal lagoons *priority feature 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 1310 Salicornia and other annuals colonising mud and sand 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") Annex II species present as a qualifying feature, but not primary reason for selection: 1016 Desmoulin's whorl snail *Vertigo moulinsiana*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; ● The extent and distribution of qualifying natural habitats and habitats of qualifying species ● The structure and function (including typical species) of qualifying natural habitats ● The structure and function of the habitats of qualifying species ● The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely ● The populations of qualifying species, and, ● The distribution of qualifying species within the site.
Solent and Isle of Wight Lagoons SAC (UK0017073)	Annex I habitats (primary reason for selection): 1150 Coastal lagoons *priority feature	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and • The supporting processes on which qualifying natural habitats rely
Solent & Southampton Water SPA (UK9011061)	Article 4.1 qualification:	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified

Habitats Sites	Qualifying Features	Conservation Objectives
	During the breeding season the area regularly supports: Mediterranean gull *Larus melanocephalus* (15.4% of the GB breeding population) Little tern *Sterna albifrons* (2% of the GB breeding population) Roseate tern *Sterna dougallii* (3.1% of the GB breeding population) Common tern *Sterna hirundo* (2.2% of the GB breeding population) Sandwich tern *Sterna sandvicensis* (1.7% of the GB breeding population) Article 4.2 qualification: Over winter the area regularly supports: Eurasian teal *Anas crecca* (1.1% of the population) Dark bellied brent goose *Branta bernicla bernicla* (2.5% of the population) Common ringed plover *Charadrius hiaticula* (1.2% of the population) Black-tailed godwit *Limosa limosa islandica* (1.7% of the population) Over winter the area regularly supports 51361 waterfowl (5 year peak mean 1992/93-1996/97)	(the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, The distribution of the qualifying features within the site.
Solent & Southampton Water Ramsar (UK11063)	Ramsar criterion 1: The site is one of the few major sheltered channels between a substantial island and mainland in European waters, exhibiting an unusual strong double tidal flow and has long periods of slack water at high and low tide. It includes many wetland habitats characteristic of the biogeographic region: saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodlands and rocky boulder reefs. Ramsar criterion 2: This site supports an important assemblage of rare plants and invertebrates. At least 33 British Red Data Book invertebrates and at least eight British Red Data Book plants are represented on site. The Mediterranean gull *Larus melanocephalus* is included in CITES Appendix I. Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: 51,343 waterfowl (5 year peak mean 1998/99 - 2002/03)	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.

Habitats Sites	Qualifying Features	Conservation Objectives
	Ramsar criterion 6: Qualifying species/populations: Species with peak counts in spring/autumn and winter: Black-tailed godwit *Limosa limosa islandica*; 1,240 individuals, representing an average of 2.6% of the population Dark bellied brent goose *Branta bernicla bernicla*; 6,456 individuals, representing an average of 3.2% of the population Eurasian teal *Anas crecca*; 5,514 individuals, representing an average of 1.1% of the population	
Solent and Dorset Coast SPA (UK9020330)	Article 1 qualification: During the breeding season the area regularly supports: Sandwich tern *Sterna sandvicensis* (4.01% of the GB breeding population) Common tern *Sterna hirundo* (4.77% of the GB breeding population) Little tern *Sterna albifrons* (3.31% of the GB breeding population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.

B.2 BNW6 Longham Aquifer Recharge

Habitats Sites	Qualifying Features	Conservation Objectives
Dorset Heaths SAC (UK0019857)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 7150 Depressions on peat substrates of the Rhynchosporion	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	Conservation Objectives
	Annex I habitats present as a qualifying feature, but not primary reason for selection: 6410 Molinia meadows on calcareous, peaty of clayey-silt-laden soils (Molinion caeruleae) 7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae *priority feature 7230 Alkaline fens 9190 Old acidophilous oak woods with *Quercus robur* on sandy plains Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale* Annex II species present as a qualifying feature, but not primary reason for selection: 1166 Great crested newt *Triturus cristatus*	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Dorset Heathlands SPA (UK9010101)	Article 4.1 qualification: During the breeding season the area regularly supports: Nightjar *Caprimulgus europaeus* (at least 12.8% of the GB breeding population) Woodlark *Lullula arborea* (at least 6.8% of the GB breeding population) Dartford warbler *Sylvia undata* (at least 26.1% of the GB breeding population) Over winter the area regularly supports: Hen harrier *Circus cyaneus* (2.7% of the GB population) Merlin *Falco columbarius* (1.2% of the GB population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
Dorset Heathlands Ramsar (UK11021)	Ramsar criterion 1: The site contains particularly good examples of northern Atlantic wet heaths with cross-leaved heath and acid mire with Rhynchosporion. The site contains the largest example in Britain of southern Atlantic wet heaths with Dorset heath and cross-leaved heath.	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."*

Habitats Sites	Qualifying Features	Conservation Objectives
	Ramsar criterion 2: The site supports 1 nationally rare and 13 nationally scarce wetland plant species, and at least 28 nationally rare wetland invertebrate species. Ramsar criterion 3: The site has a high species richness and high ecological diversity of wetland habitat types and transitions and lies in one of the most biologically-rich wetland areas of lowland Britain, being continuous with three other Ramsar sites - Poole Harbour, Avon Valley and The New Forest.	Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.
Solent and Dorset Coast SPA (UK9020330)	Article 1 qualification: During the breeding season the area regularly supports: Sandwich tern *Sterna sandvicensis* (4.01% of the GB breeding population) Common tern *Sterna hirundo* (4.77% of the GB breeding population) Little tern *Sterna albifrons* (3.31% of the GB breeding population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
River Avon SAC (UK0013016)	Annex I habitats (primary reason for site selection): 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation Annex II species (primary reason for site selection): 1016 Desmoulin's whorl snail *Vertigo moulinsiana* 1095 Sea lamprey *Petromyzon marinus* 1096 Brook lamprey *Lampetra planeri* 1106 Atlantic salmon *Salmo salar* 1163 Bullhead *Cottus gobio*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely

Habitats Sites	Qualifying Features	Conservation Objectives
		• The populations of qualifying species, and, • The distribution of qualifying species within the site
Avon Valley SPA (UK9011091)	Article 4.1 qualification: Over winter the area regularly supports: Bewick's swan *Cygnus columbianus bewickii* (1.9% of the GB population) Article 4.2 qualification: Over winter the area regularly supports: Gadwall *Anas strepera* (2.2% of the population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; • The extent and distribution of the habitats of the qualifying features • The structure and function of the habitats of the qualifying features • The supporting processes on which the habitats of the qualifying features rely • The population of each of the qualifying features, and, • The distribution of the qualifying features within the site.
Avon Valley Ramsar (UK11005)	Ramsar criterion 1: The site shows a greater range of habitats than any other chalk river in Britain, including fen, mire, lowland wet grassland and small areas of woodland. Ramsar criterion 2: The site supports a diverse assemblage of wetland flora and fauna including several nationally rare species. Ramsar criterion 6: Species/populations occurring at levels of international importance: Species with peak counts in winter: Gadwall *Anas strepera;* 537 individuals representing an average of 3.1% of the GB population. Species/populations identified subsequent to designation for possible consideration under criterion 6: Species with peak counts in winter: Northern pintail *Anas acuta*; 715 individuals representing an average of 1.1% of the population	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.

Habitats Sites	Qualifying Features	Conservation Objectives
	Black-tailed godwit *Limosa limosa islandica*; 1,142 individuals representing an average of 3.2% of the population	
Poole Harbour SPA (UK9010111)	Article 4.1 qualification: During the breeding season the area regularly supports: Mediterranean gull *Larus melanocephalus* (10% of the GB breeding population) Common tern *Sterna hirundo* (1.8% of the Gb breeding population) Sandwich tern *Sterna sanvicensis* (1.6% of the GB breeding population) Over winter the area regularly supports: Avocet *Recurvirostra avosetta* (36.1% of the GB population) Little egret *Egretta garzetta* (2.5% of the GB population) Eurasian spoonbill *Platalea leucorodia* (100% of the GB population) Article 4.2 qualification: Over winter the area regularly supports: Shelduck *Tadorna tadorna* (1.2% of the biogeographic population - NW Europe) Black-tailed godwit *Limosa limosa islandica* (2.3% of the biogeographic population - NW Europe) In the non-breeding season the area regularly supports 25,176 individuals (4 year peak mean 1993/94 - 1996/97)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
Poole Harbour Ramsar (UK11054)	Ramsar criterion 1: The site is the best and largest example of a bar-built estuary with lagoonal characteristic (a natural harbour) in Britain. Ramsar criterion 2: The site supports two species of nationally rare plant and one nationally rare alga. There are at least three British Red Data Book invertebrate species. Ramsar criterion 3: The site includes examples of natural habitat types of community interest - Mediterranean and thermo Atlantic halophilous scrubs and calcareous fens. transitions from saltmarsh through to peatland mires are of exceptional conservation importance as few examples remain in Britain. The site supports	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.

Habitats Sites	Qualifying Features	Conservation Objectives
	nationally important populations of breeding waterfowl and a nationally important population of avocet of winter. Ramsar criterion 5: The site supports 24,709 waterfowl over winter (5 year peak mean 1998/99 - 2002/03) Ramsar criterion 6: Species/populations occurring at levels of international importance: Species with peak counts in winter: Shelduck *Tadorna tadorna*; 2,120 individuals representing an average of 2.7% of the GB population Black-tailed godwit *Limosa limosa islandica*; 1,724 individuals representing an average of 4.9% of the population Species/populations identified subsequent to designation for possible future consideration under criterion 6: Species with peak counts in winter: Avocet *Recurvirostra avosetta*; 1,260 individuals representing an average of 1.7% of the population	

B.3 BNW14 Ibsley Lake

Habitats Sites	Qualifying Features	Conservation Objectives
River Avon SAC (UK0013016)	Annex I habitats (primary reason for site selection): 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation Annex II species (primary reason for site selection): 1016 Desmoulin's whorl snail *Vertigo moulinsiana* 1095 Sea lamprey *Petromyzon marinus* 1096 Brook lamprey *Lampetra planeri* 1106 Atlantic salmon *Salmo salar*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species

Habitats Sites	Qualifying Features	Conservation Objectives
	1163 Bullhead *Cottus gobio*	• The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Avon Valley SPA (UK9011091)	Article 4.1 qualification: Over winter the area regularly supports: Bewick's swan *Cygnus columbianus bewickii* (1.9% of the GB population) Article 4.2 qualification: Over winter the area regularly supports: Gadwall *Anas strepera* (2.2% of the population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
Avon Valley Ramsar (UK11005)	Ramsar criterion 1: The site shows a greater range of habitats than any other chalk river in Britain, including fen, mire, lowland wet grassland and small areas of woodland. Ramsar criterion 2: The site supports a diverse assemblage of wetland flora and fauna including several nationally rare species. Ramsar criterion 6: Species/populations occurring at levels of international importance: Species with peak counts in winter: Gadwall *Anas strepera;* 537 individuals representing an average of 3.1% of the GB population.	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.

Habitats Sites	Qualifying Features	Conservation Objectives
	Species/populations identified subsequent to designation for possible consideration under criterion 6: Species with peak counts in winter: Northern pintail *Anas acuta*; 715 individuals representing an average of 1.1% of the population Black-tailed godwit *Limosa limosa islandica*; 1,142 individuals representing an average of 3.2% of the population	
Solent and Dorset Coast SPA (UK9020330)	Article 1 qualification: During the breeding season the area regularly supports: Sandwich tern *Sterna sandvicensis* (4.01% of the GB breeding population) Common tern *Sterna hirundo* (4.77% of the GB breeding population) Little tern *Sterna albifrons* (3.31% of the GB breeding population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
Dorset Heaths SAC (UK0019857)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 7150 Depressions on peat substrates of the Rhynchosporion Annex I habitats present as a qualifying feature, but not primary reason for selection: 6410 Molinia meadows on calcareous, peaty of clayey-silt-laden soils (Molinion caeruleae) 7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae *priority feature 7230 Alkaline fens 9190 Old acidophilous oak woods with *Quercus robur* on sandy plains Annex II species (primary reason for site selection):	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site

Habitats Sites	Qualifying Features	Conservation Objectives
	1044 Southern damselfly *Coenagrion mercuriale* Annex II species present as a qualifying feature, but not primary reason for selection: 1166 Great crested newt *Triturus cristatus*	
Dorset Heathlands SPA (UK9010101)	Article 4.1 qualification: During the breeding season the area regularly supports: Nightjar *Caprimulgus europaeus* (at least 12.8% of the GB breeding population) Woodlark *Lullula arborea* (at least 6.8% of the GB breeding population) Dartford warbler *Sylvia undata* (at least 26.1% of the GB breeding population) Over winter the area regularly supports: Hen harrier *Circus cyaneus* (2.7% of the GB population) Merlin *Falco columbarius* (1.2% of the GB population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, The distribution of the qualifying features within the site.
Dorset Heathlands Ramsar (UK11021)	Ramsar criterion 1: The site contains particularly good examples of northern Atlantic wet heaths with cross-leaved heath and acid mire with Rhynchosporion. The site contains the largest example in Britain of southern Atlantic wet heaths with Dorset heath and cross-leaved heath. Ramsar criterion 2: The site supports 1 nationally rare and 13 nationally scarce wetland plant species, and at least 28 nationally rare wetland invertebrate species. Ramsar criterion 3: The site has a high species richness and high ecological diversity of wetland habitat types and transitions and lies in one of the most biologically-rich wetland areas of lowland Britain, being continuous with three other Ramsar sites - Poole Harbour, Avon Valley and The New Forest.	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.
The New Forest SAC (UK0012557)	Annex I habitats (primary reason for site selection):	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	Conservation Objectives
	3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the Isoeto-nanojuncetea 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) 7150 Depressions on peat substrates of the Rhynchosporion 9120 Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (QUercion robori-petraeae or Ilici-Fagenion 9130 Asperulo-Fagetum beech forests 9190 Old acidophilous oak woods with Quercus robur on sandy plains 91D0 Bog woodland *priority feature 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (ALno-Padion, Alnion incanae, Silicion albae) *priority feature Annex I habitats present as a qualifying feature, but not primary reason for selection: 7140 Transition mires and quaking bogs 7230 Alkaline fens Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale* 1083 Stag beetle *Lucanus cervus* Annex II species present as a qualifying feature, but not primary reason for selection: 1166 Great crested newt *Triturus cristatus*	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
New Forest SPA (UK9011031)	Article 4.1 qualification: During the breeding season the area regularly supports: Nightjar *Caprimulgus europaeus* (8.8% of the GB population) Woodlark *Lullula arborea* (29.5% of the GB breeding population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	Conservation Objectives
	Honey buzzard *Pernis apivorus* (12.5% of the GB breeding population) Dartford warbler *Sylvia undata* (33.6% of the GB breeding population) Over the winter the area regularly supports: Hen harrier *Circus cyaneus* (2% of the GB population) Article 4.2 qualification: During the breeding season the area regularly supports: Hobby *Falco subbuteo* (5% of the GB population) Wood warbler *Phylloscopus sibilatrix* (at least 2% of the GB population)	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, The distribution of the qualifying features within the site.
New Forest Ramsar (UK11047)	Ramsar criterion 1: Valley mires and wet heaths are found throughout the site and are of outstanding scientific interest. This is the largest concentration of intact valley mires of their type in Britain. Ramsar crieterion 2: The site supports a diverse assemblage of wetland plants and animals including several nationally rare species. Seven species of nationally rare plants are found on site, as are at least 65 British Red Data Book invertebrate species. Ramsar criterion 3: The mire habitats are of high ecological quality and diversity and have undisturbed transitional zones. The invertebrate fauna of the site is important due to the concentration of rare and scarce wetland species. The whole site complex, with its examples of semi-natural habitats is essential to the genetic and ecological diversity of southern England. This site contains a rich invertebrate fauna.	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.

B.4 COL15 Restormel WTW – increase treatment capacity to 110 Ml/dMl/d

Habitats Sites	Qualifying Features	
Breney Common and Goss & Tregoss Moors SAC (UK0030098)	Annex I habitats (primary reason for selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 7140 Transition mires and quaking bogs Annex II species (primary reason for selection): 1065 Marsh fritillary butterfly *Euphydryas aurinia*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
River Camel SAC (UK0030056)	Annex I habitats present as a qualifying feature, but not primary reason for selection: 4030 European dry heaths 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) *priority feature Annex II species (primary reason for site selection): 1163 Bullhead *Cottus gobio* 1355 Otter *Lutra lutra* Annex II species present as qualifying features, but not primary reason for selection: 1106 Atlantic salmon *Salmo salar*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Polruan to Polperro SAC (UK0030241)	Annex I habitats (primary reason for site selection): 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	
	Annex I habitats present as a qualifying feature, but not primary reason for selection: 4030 European dry heaths Annex II species (primary reason for site selection): 1441 Shore dock *Rumex rupestris*	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Falmouth Bay to St. Austell Bay SPA (UK9020323)	Article 4.1 qualification: Over winter the area regularly supports: Black-throated diver *Gavia arctica* (20.5% of the GB population) Great northern diver *Gavia immer* (3% of the GB population) Slavonian grebe *Podiceps auritus* (1.4% of the GB population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.

B.5 COL22 Roadford to Colliford via Saltash

Habitats Sites	Qualifying Features	Conservation Objectives
Plymouth Sound and Estuaries SAC (UK0013111)	Annex I habitats (primary reason for site selection): 1110 Sandbanks which are slightly covered by sea water all the time 1130 Estuaries 1160 Large shallow inlets and bays	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	Conservation Objectives
	1170 Reefs 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Annex I habitats present as a qualifying feature, but not primary reason for selection: 1140 Mudflats and sandflats not covered by seawater at low tide Annex II species (primary reason for site selection): 1441 Shore dock *Rumex rupestris* Annex II species present as a qualifying feature, but not primary reason for selection: 1102 Allis shad *Alosa alosa*	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Tamar Estuaries Complex SPA (UK9010141)	Article 4.1 qualification: Over winter the area regularly supports: Avocet *Recurvirostra avosetta* (15.8% of the GB population) On passage the area regularly supports: Little egret *Egretta garzetta* (at least 9.3% of the GB population	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; • The extent and distribution of the habitats of the qualifying features • The structure and function of the habitats of the qualifying features • The supporting processes on which the habitats of the qualifying features rely • The population of each of the qualifying features, and, • The distribution of the qualifying features within the site.

B.6 ROA7 Expansion of Northcombe WTW to 60 Ml/dMl/d

Habitats Sites	Qualifying Features	
Culm Grasslands SAC (UK0012679)	Annex I habitats (primary reason for site selection): 6410 Molinia meadows on calcareous, peaty of clayey-silt-laden soils (Molinion caeruleae)	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	
	Annex I habitats present as a qualifying feature, but not primary reason for selection: 4010 Northern Atlantic wet heaths with Erica tetralix Annex II species (primary reason for site selection): 1065 Marsh fritillary butterfly *Euphydryas aurinia*	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Dartmoor SAC (UK0012929)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 7130 Blanket bogs (* if active bog) *priority feature 91A0 Old sessile woods with *Ilex* and *Blechnum* in the British Isles Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale* Annex II species present as a qualifying feature, but not primary reason for selection: 1106 Atlantic salmon *Salmo salar* 1355 Otter *Lutra lutra*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site

B.7 ROA17 Littlehempston WTW

Habitats Sites	Qualifying Features	
South Hams SAC (UK0012650)	Annex I habitats (primary reason for site selection): 4030 European dry heaths 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) Annex I habitats present as a qualifying feature, but not primary reason for selection: 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 8310 Caves not open to the public 9180 Tilio-Acerion forests of slopes, screes and ravines Annex II species (primary reason for site selection): 1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
South Dartmoor Woods SAC (UK0012749)	Annex I habitats (primary reason for site selection): 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Annex I habitats present as a qualifying feature, but not primary reason for selection: 4030 European dry heaths	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely
Lyme Bay and Torbay SAC (UK0030372)	Annex I habitats (primary reason for site selection): 1170 Reefs 8330 Submerged or partially submerged sea caves	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats

Habitats Sites	Qualifying Features	
		• The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely
Dartmoor SAC (UK0012929)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 7130 Blanket bogs (* if active bog) *priority feature 91A0 Old sessile woods with *Ilex* and *Blechnum* in the British Isles Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale* Annex II species present as a qualifying feature, but not primary reason for selection: 1106 Atlantic salmon *Salmo salar* 1355 Otter *Lutra lutra*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site

B.8 ROA21 Roborough to Littlehempston WTW

Habitats Sites	Qualifying Features	Conservation Objectives
Dartmoor SAC (UK0012929)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 7130 Blanket bogs (* if active bog) *priority feature 91A0 Old sessile woods with *Ilex* and *Blechnum* in the British Isles Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species

Habitats Sites	Qualifying Features	Conservation Objectives
	Annex II species present as a qualifying feature, but not primary reason for selection: 1106 Atlantic salmon *Salmo salar* 1355 Otter *Lutra lutra*	• The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
South Dartmoor Woods SAC (UK0012749)	Annex I habitats (primary reason for site selection): 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Annex I habitats present as a qualifying feature, but not primary reason for selection: 4030 European dry heaths	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, The supporting processes on which qualifying natural habitats rely
Plymouth Sound and Estuaries SAC (UK0013111)	Annex I habitats (primary reason for site selection): 1110 Sandbanks which are slightly covered by sea water all the time 1130 Estuaries 1160 Large shallow inlets and bays 1170 Reefs 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Annex I habitats present as a qualifying feature, but not primary reason for selection: 1140 Mudflats and sandflats not covered by seawater at low tide Annex II species (primary reason for site selection): 1441 Shore dock *Rumex rupestris* Annex II species present as a qualifying feature, but not primary reason for selection: 1102 Allis shad *Alosa alosa*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site

Habitats Sites	Qualifying Features	Conservation Objectives
Start Point to Plymouth Sound & Eddystone SAC (UK0030373)	Annex I habitats (primary reason for site selection): 1170 Reefs	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely
South Hams SAC (UK0012650)	Annex I habitats (primary reason for site selection): 4030 European dry heaths 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) Annex I habitats present as a qualifying feature, but not primary reason for selection: 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 8310 Caves not open to the public 9180 Tilio-Acerion forests of slopes, screes and ravines Annex II species (primary reason for site selection): 1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, The distribution of qualifying species within the site
Lyme Bay and Torbay SAC (UK0030372)	Annex I habitats (primary reason for site selection): 1170 Reefs 8330 Submerged or partially submerged sea caves	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats

Habitats Sites	Qualifying Features	Conservation Objectives
		• The structure and function (including typical species) of qualifying natural habitats, and, The supporting processes on which qualifying natural habitats rely
Tamar Estuaries Complex SPA (UK9010141)	Article 4.1 qualification: Over winter the area regularly supports: Avocet *Recurvirostra avosetta* (15.8% of the GB population) On passage the area regularly supports: Little egret *Egretta garzetta* (at least 9.3% of the GB population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; • The extent and distribution of the habitats of the qualifying features • The structure and function of the habitats of the qualifying features • The supporting processes on which the habitats of the qualifying features rely • The population of each of the qualifying features, and, The distribution of the qualifying features within the site.

B.9 WIM2 Sidford borehole commissioning

Habitats Sites	Qualifying Features	Conservation Objectives
Sidmouth to West Bay SAC (UK0019864)	Annex I habitats (primary reason for site selection): 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 9180 Tilio-Acerion forests of slopes, screes and ravines *priority feature Annex I habitats present as a qualifying feature, but not primary reason for selection: 1210 Annual vegetation of drift lines	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely
East Devon Pebblebed Heaths SAC (UK0012602)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	Conservation Objectives
	Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale*	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
East Devon Heaths SPA (UK9010121)	Article 4.1 qualification: During the breeding season the area regularly supports: Nightjar *Caprimulgus europaeus* (2.4% of the GB breeding population) Dartford warbler *Sylvia undata* (8% of the GB breeding population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
Beer Quarry & Caves SAC (UK0012585)	Annex II species (primary reason for site selection): 1323 Bechstein's bat *Myotis bechsteinii* Annex II species present as a qualifying feature, but not primary reason for site selection: 1303 Lesser horseshoe bat *Rhinolophus hipposideros* 1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of the habitats of qualifying species • The structure and function of the habitats of qualifying species • The supporting processes on which the habitats of qualifying species rely • The populations of qualifying species, and,

Habitats Sites	Qualifying Features	Conservation Objectives
		• The distribution of qualifying species within the site.
Lyme Bay and Torbay SAC (UK0030372)	Annex I habitats (primary reason for site selection): 1170 Reefs 8330 Submerged or partially submerged sea caves	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely

B.10 WIM5 Indirect potable reuse – stream support for Dotton WTW

Habitats Sites	Qualifying Features	Conservation Objectives
Sidmouth to West Bay SAC (UK0019864)	Annex I habitats (primary reason for site selection): 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 9180 Tilio-Acerion forests of slopes, screes and ravines *priority feature	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely
	Annex I habitats present as a qualifying feature, but not primary reason for selection: 1210 Annual vegetation of drift lines	
East Devon Pebblebed Heaths SAC (UK0012602)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with Erica tetralix 4030 European dry heaths	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;
	Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale*	

Habitats Sites	Qualifying Features	Conservation Objectives
		• The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
East Devon Heaths SPA (UK9010121)	Article 4.1 qualification: During the breeding season the area regularly supports: Nightjar *Caprimulgus europaeus* (2.4% of the GB breeding population) Dartford warbler *Sylvia undata* (8% of the GB breeding population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.

B.11 WIM11 Couchill Springs, Seaton & dW3 Wilmington Springs Licence

Habitats Sites	Qualifying Features	Conservation Objectives
Sidmouth to West Bay SAC (UK0019864)	Annex I habitats (primary reason for site selection): 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 9180 Tilio-Acerion forests of slopes, screes and ravines *priority feature Annex I habitats present as a qualifying feature, but not primary reason for selection: 1210 Annual vegetation of drift lines	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats

Habitats Sites	Qualifying Features	Conservation Objectives
		• The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely
River Axe SAC (UK0030248)	Annex I habitats (primary reason for site selection): 3260 Water course of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation Annex II species present as a qualifying feature, but not primary reason for selection: 1095 Sea lamprey Petromyzon marinus 1096 Brook lamprey Lampetra planeri 1163 Bullhead Cottus gobio	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Lyme Bay and Torbay SAC (UK0030372)	Annex I habitats (primary reason for site selection): 1170 Reefs 8330 Submerged or partially submerged sea caves	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely
Beer Quarry & Caves SAC (UK0012585)	Annex II species (primary reason for site selection): 1323 Bechstein's bat Myotis bechsteinii Annex II species present as a qualifying feature, but not primary reason for site selection: 1303 Lesser horseshoe bat Rhinolophus hipposideros	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	Conservation Objectives
	1304 Greater horseshoe bat Rhinolophus ferrumequinum	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, The distribution of qualifying species within the site

B.12 WIM12 Allers Springs, WIM14 Whitecross Distribution Upgrade, dW1 Brampford Speke and Stoke Canon (North Exeter Boreholes) & dW4 Wimbleball not releasing compensation flows when making supply releases

Habitats Sites	Qualifying Features	
Exe Estuary SPA (UK9010081)	Article 4.1 qualification: Over winter the area regularly supports: Slavonian grebe *Podiceps auritus* (5% of the GB population) Avocet *Recurvirostra avosetta* (28.3% of the GB population) Article 4.2 qualification: Over winter the area regularly supports: Dark bellied brent goose *Branta bernicla bernicla* (0.6% of the population) Dunlin *Calidris alpina alpina* (1.1% of the GB population) Oystercatcher *Haematopus ostralegus* (1.2% of the GB population) Black-tailed godwit *Limosa limosa islandica* (7.2% of the GB population) Grey plover *Pluvialis squatarola* (1.1% of the GB population) Over winter the area regularly supports 23,811 waterfowl (5 year peak mean 1991/92 - 1995/96)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; • The extent and distribution of the habitats of the qualifying features • The structure and function of the habitats of the qualifying features • The supporting processes on which the habitats of the qualifying features rely • The population of each of the qualifying features, and, • The distribution of the qualifying features within the site.

Habitats Sites	Qualifying Features	
Exe Estuary Ramsar (UK11025)	Ramsar criterion 5: Species with peak counts in winter: 20,263 waterfowl (5 year peak mean 1998/99 - 2002/03) Ramsar criterion 6: Species/populations occuring at levels of international importance: Species with peak counts in winter: Dark-bellied brent goose *Branta bernicla bernicla*; 1,509 individuals representing an average of 1.5% of the GB population Species/populations identified subsequent to designation for possible future consideration under criterion 6: Black-tailed godwit *Limosa limosa islandica*: 857 individuals representing an average of 2.4% of the population	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.
Dawlish Warren SAC (UK0030130)	Annex I habitats (primary reason for site selection): 2190 Humid dune slacks Annex I habitats present as a qualifying feature, but not primary reason for selection: 2120 "Shifting dunes along the shoreline with *Ammophila arenaria* (""white dunes"")" 2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")" *priority feature Annex II species (primary reason for site selection): 1395 Petalwort *Petalophyllum ralfsii*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site.

B.13 dB1 Wimborne Borehole

Habitats Sites	Qualifying Features	Conservation Objectives
River Avon SAC (UK0013016)	Annex I habitats (primary reason for site selection): 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation Annex II species (primary reason for site selection): 1016 Desmoulin's whorl snail *Vertigo moulinsiana* 1095 Sea lamprey *Petromyzon marinus* 1096 Brook lamprey *Lampetra planeri* 1106 Atlantic salmon *Salmo salar* 1163 Bullhead *Cottus gobio*	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Solent and Dorset Coast SPA (UK9020330)	Article 1 qualification: During the breeding season the area regularly supports: Sandwich tern *Sterna sandvicensis* (4.01% of the GB breeding population) Common tern *Sterna hirundo* (4.77% of the GB breeding population) Little tern *Sterna albifrons* (3.31% of the GB breeding population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
Dorset Heaths SAC (UK0019857)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 7150 Depressions on peat substrates of the Rhynchosporion	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	Conservation Objectives
	Annex I habitats present as a qualifying feature, but not primary reason for selection: 6410 Molinia meadows on calcareous, peaty of clayey-silt-laden soils (Molinion caeruleae) 7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae *priority feature 7230 Alkaline fens 9190 Old acidophilous oak woods with *Quercus robur* on sandy plains Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale* Annex II species present as a qualifying feature, but not primary reason for selection: 1166 Great crested newt *Triturus cristatus*	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Dorset Heathlands SPA (UK9010101)	Article 4.1 qualification: During the breeding season the area regularly supports: Nightjar *Caprimulgus europaeus* (at least 12.8% of the GB breeding population) Woodlark *Lullula arborea* (at least 6.8% of the GB breeding population) Dartford warbler *Sylvia undata* (at least 26.1% of the GB breeding population) Over winter the area regularly supports: Hen harrier *Circus cyaneus* (2.7% of the GB population) Merlin *Falco columbarius* (1.2% of the GB population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, The distribution of the qualifying features within the site.
Dorset Heathlands Ramsar (UK11021)	Ramsar criterion 1: The site contains particularly good examples of northern Atlantic wet heaths with cross-leaved heath and acid mire with Rhynchosporion. The site contains the largest example in Britain of southern Atlantic wet heaths with Dorset heath and cross-leaved heath. Ramsar criterion 2:	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."*

Habitats Sites	Qualifying Features	Conservation Objectives
	The site supports 1 nationally rare and 13 nationally scarce wetland plant species, and at least 28 nationally rare wetland invertebrate species. Ramsar criterion 3: The site has a high species richness and high ecological diversity of wetland habitat types and transitions and lies in one of the most biologically-rich wetland areas of lowland Britain, being continuous with three other Ramsar sites - Poole Harbour, Avon Valley and The New Forest.	Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.
Poole Harbour SPA (UK9010111)	Article 4.1 qualification: During the breeding season the area regularly supports: Mediterranean gull *Larus melanocephalus* (10% of the GB breeding population) Common tern *Sterna hirundo* (1.8% of the Gb breeding population) Sandwich tern *Sterna sanvicensis* (1.6% of the GB breeding population) Over winter the area regularly supports: Avocet *Recurvirostra avosetta* (36.1% of the GB population) Little egret *Egretta garzetta* (2.5% of the GB population) Eurasian spoonbill *Platalea leucorodia* (100% of the GB population) Article 4.2 qualification: Over winter the area regularly supports: Shelduck *Tadorna tadorna* (1.2% of the biogeographic population - NW Europe) Black-tailed godwit *Limosa limosa islandica* (2.3% of the biogeographic population - NW Europe) In the non-breeding season the area regularly supports 25,176 individuals (4 year peak mean 1993/94 - 1996/97)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, The distribution of the qualifying features within the site.
Poole Harbour Ramsar (UK11054)	Ramsar criterion 1: The site is the best and largest example of a bar-built estuary with lagoonal characteristic (a natural harbour) in Britain. Ramsar criterion 2: The site supports two species of nationally rare plant and one nationally rare alga. There are at least three British Red Data Book invertebrate species.	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."*

Habitats Sites	Qualifying Features	Conservation Objectives
	Ramsar criterion 3: The site includes examples of natural habitat types of community interest - Mediterranean and thermo Atlantic halophilous scrubs and calcareous fens. transitions from saltmarsh through to peatland mires are of exceptional conservation importance as few examples remain in Britain. The site supports nationally important populations of breeding waterfowl and a nationally important population of avocet of winter. Ramsar criterion 5: The site supports 24,709 waterfowl over winter (5 year peak mean 1998/99 - 2002/03) Ramsar criterion 6: Species/populations occurring at levels of international importance: Species with peak counts in winter: Shelduck *Tadorna tadorna*; 2,120 individuals representing an average of 2.7% of the GB population Black-tailed godwit *Limosa limosa islandica*; 1,724 individuals representing an average of 4.9% of the population Species/populations identified subsequent to designation for possible future consideration under criterion 6: Species with peak counts in winter: Avocet *Recurvirostra avosetta*; 1,260 individuals representing an average of 1.7% of the population	Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.

B.14 dB2 Stanbridge Licence

Habitats Sites	Qualifying Features	Conservation Objectives
River Avon SAC (UK0013016)	Annex I habitats (primary reason for site selection): 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Habitats Sites	Qualifying Features	Conservation Objectives
	Annex II species (primary reason for site selection): 1016 Desmoulin's whorl snail *Vertigo moulinsiana* 1095 Sea lamprey *Petromyzon marinus* 1096 Brook lamprey *Lampetra planeri* 1106 Atlantic salmon *Salmo salar* 1163 Bullhead *Cottus gobio*	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Solent and Dorset Coast SPA (UK9020330)	Article 1 qualification: During the breeding season the area regularly supports: Sandwich tern *Sterna sandvicensis* (4.01% of the GB breeding population) Common tern *Sterna hirundo* (4.77% of the GB breeding population) Little tern *Sterna albifrons* (3.31% of the GB breeding population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, ● The distribution of the qualifying features within the site.
Dorset Heaths SAC (UK0019857)	Annex I habitats (primary reason for site selection): 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 7150 Depressions on peat substrates of the Rhynchosporion Annex I habitats present as a qualifying feature, but not primary reason for selection: 6410 Molinia meadows on calcareous, peaty of clayey-silt-laden soils (Molinion caeruleae)	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats

Habitats Sites	Qualifying Features	Conservation Objectives
	7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae *priority feature 7230 Alkaline fens 9190 Old acidophilous oak woods with *Quercus robur* on sandy plains Annex II species (primary reason for site selection): 1044 Southern damselfly *Coenagrion mercuriale* Annex II species present as a qualifying feature, but not primary reason for selection: 1166 Great crested newt *Triturus cristatus*	• The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site
Dorset Heathlands SPA (UK9010101)	Article 4.1 qualification: During the breeding season the area regularly supports: Nightjar *Caprimulgus europaeus* (at least 12.8% of the GB breeding population) Woodlark *Lullula arborea* (at least 6.8% of the GB breeding population) Dartford warbler *Sylvia undata* (at least 26.1% of the GB breeding population) Over winter the area regularly supports: Hen harrier *Circus cyaneus* (2.7% of the GB population) Merlin *Falco columbarius* (1.2% of the GB population)	With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; ● The extent and distribution of the habitats of the qualifying features ● The structure and function of the habitats of the qualifying features ● The supporting processes on which the habitats of the qualifying features rely ● The population of each of the qualifying features, and, The distribution of the qualifying features within the site.
Dorset Heathlands Ramsar (UK11021)	Ramsar criterion 1: The site contains particularly good examples of northern Atlantic wet heaths with cross-leaved heath and acid mire with Rhynchosporion. The site contains the largest example in Britain of southern Atlantic wet heaths with Dorset heath and cross-leaved heath. Ramsar criterion 2: The site supports 1 nationally rare and 13 nationally scarce wetland plant species, and at least 28 nationally rare wetland invertebrate species. Ramsar criterion 3:	Conservation objectives are not produced for Ramsar sites. In this instance, regard has been had to the high-level conservation objective established in the Ramsar Convention's "wise use of wetlands" which states: *"…the maintenance of ecological character, achieved through the implementation of ecosystem approaches within the context of sustainable development" (Ramsar Convention Secretariat, 2010)."* Furthermore, with the reference to the relevant qualifying interest features of the Ramsar site, the conservation advice package produced by Natural England for the overlapping SAC and SPA designations will be, in most cases, sufficient to support the management of the Ramsar interests.

Habitats Sites	Qualifying Features	Conservation Objectives
	The site has a high species richness and high ecological diversity of wetland habitat types and transitions and lies in one of the most biologically-rich wetland areas of lowland Britain, being continuous with three other Ramsar sites - Poole Harbour, Avon Valley and The New Forest.	

B.15 dW2 Hook Springs Licence

Habitats Sites	Qualifying Features	Conservation Objectives
Sidmouth to West Bay SAC (UK0019864)	Annex I habitats (primary reason for site selection): 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 9180 Tilio-Acerion forests of slopes, screes and ravines *priority feature	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;
	Annex I habitats present as a qualifying feature, but not primary reason for selection: 1210 Annual vegetation of drift lines	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely
River Axe SAC (UK0030248)	Annex I habitats (primary reason for site selection): 3260 Water course of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;
	Annex II species present as a qualifying feature, but not primary reason for selection: 1095 Sea lamprey Petromyzon marinus 1096 Brook lamprey Lampetra planeri 1163 Bullhead Cottus gobio	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely

Habitats Sites	Qualifying Features	Conservation Objectives
		• The populations of qualifying species, and, • The distribution of qualifying species within the site
Lyme Bay and Torbay SAC (UK0030372)	Annex I habitats (primary reason for site selection): 1170 Reefs 8330 Submerged or partially submerged sea caves	With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats • The structure and function (including typical species) of qualifying natural habitats, and, • The supporting processes on which qualifying natural habitats rely