



ANNEX B3.3.3

Habitats Regulation Assessment

This document has been written in line with the requirements of the RAPID gate two guidance and to comply with the regulatory process pursuant to Severn Trent Water's and Affinity Water's statutory duties. The information presented relates to material or data which is still in the course of completion. Should the solution presented in this document be taken forward, Severn Trent Water and Affinity Water will be subject to the statutory duties pursuant to the necessary consenting process, including environmental assessment and consultation as required. This document should be read with those duties in mind.



Grand Union Canal Strategic Resource Option

Habitats Regulations Assessment

June 2022

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Glossary

Acronym	Definition
ACWG	All Company Working Group
AWB	Artificial Waterbody
EAR	Environmental Assessment Report
EU	European Union
GEP	Good Ecological Potential
GES	Good Ecological Status
GUC	Grand Union Canal
HMWB	Heavily Modified Waterbody
INNS	Invasive Non Native Species
MI/d	Megalitres per day
POM	Programme of Measures [WFD measures required to improve waterbody status]
PS	Pumping station
RAPID	Regulators' Alliance for Progressing Infrastructure Development
RBMP	River Basin Management Plan
RNAG	Reason for Not Achieving Good [WFD status]
SRO	Strategic Resource Option
WFD	Water Framework Directive
WRSE	Water Resources South East
WSR	Water supply reservoir
WSW	Water Supply Works
WwTW	Water Treatment Works

1 Introduction

1.1 Background

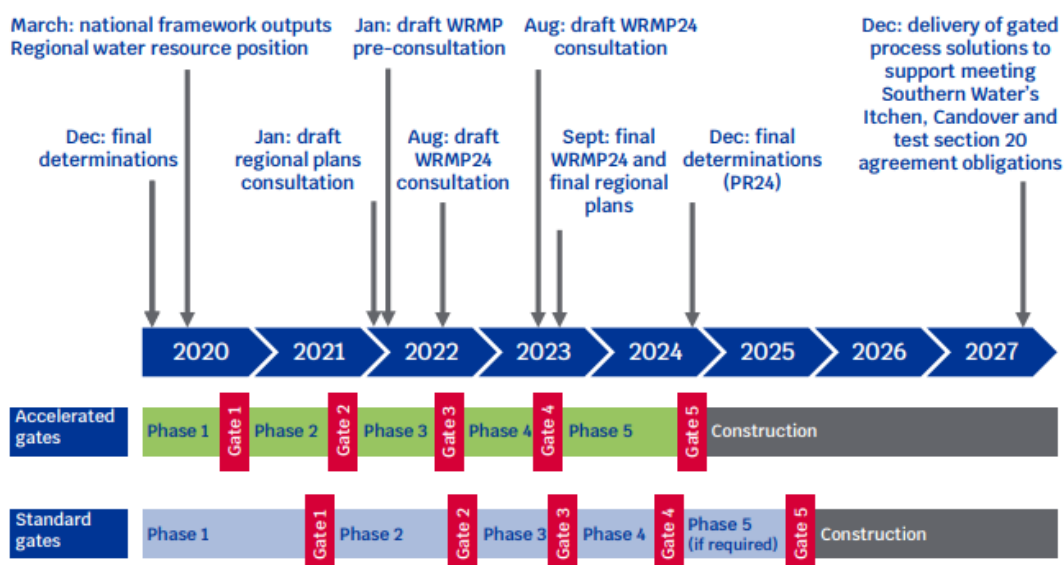
Ofwat, the economic regulator for the water and sewerage sectors in England and Wales, has identified the potential for water companies to jointly deliver strategic water resource schemes to secure long-term water supply resilience while protecting the environment.

To support the progression of these Strategic Resource Options (SROs), the Regulatory Alliance for Progressing Infrastructure Development (RAPID) has been established, comprised of representatives from Ofwat, the Environment Agency and the Drinking Water Inspectorate. RAPID has produced guidance for progressing each SRO which is aligned to a formal gated process to ensure that at each gate:

- Companies are progressing strategic water resource solutions that have been allocated funding at PR19 or have subsequently joined the programme.
- Costs incurred in doing so are efficient.
- Solutions merit continued investigation and development during the period 2020 to 2025.

The timelines for the assessment gates are shown in Figure 1.1 below; the Grand Union Canal (GUC) SRO is on the standard gate timeline and is currently at Gate 2.

Figure 1.1: Gated process for potential strategic regional water resource solution¹



1.2 Grand Union Canal SRO

The GUC SRO has been jointly developed in partnership between Severn Trent Water (STW), Affinity Water (AW) and the Canal and River Trust (the Trust). At the start of Gate 1 a long-list of sub-option routes were derived for the GUC SRO. The discharge options were then shortlisted

¹ Source: Regulators' Alliance for Progressing Infrastructure Development, Forward programme 2021-22, March 2021, available online at https://www.ofwat.gov.uk/wp-content/uploads/2021/03/RAPID-Forward-programme-2021_22.pdf, accessed 07/03/2022.

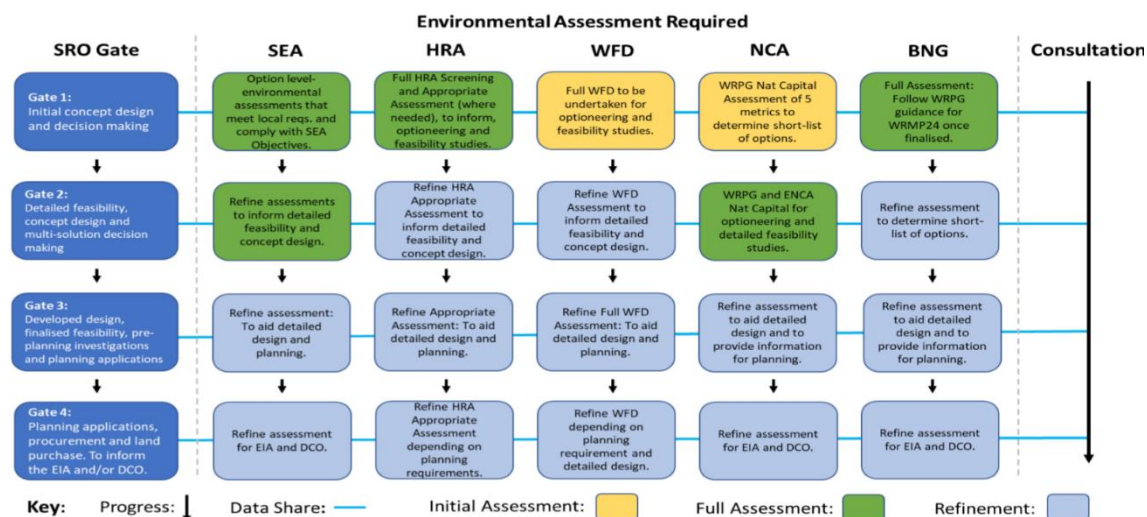
to three route options by the start of Gate 2 based on the following criteria: environmental and societal impacts; operational flexibility and resilience; operational and embedded carbon; and cost. Of these, Option Route 3 was selected. Optioneering was also undertaken with regards to abstraction locations. A site at Leighton Buzzard was ultimately selected, further details on the optioneering process can be found in the Gate 2 submission.

The single solution assessed at Gate 2 includes the pipeline from Minworth to Atherstone (Route 3), the canal transfer to Leighton Buzzard and the abstraction and treatment works at this location (hereafter referred to as 'the scheme') and will be assessed in the following Gate 2 Environmental assessments:

- Natural Capital Assessment (NCA) and Biodiversity Net Gain (BNG) (Annex B3.3.2)
- Environmental Appraisal Report (EAR) (Annex B3.3.5)
- Fish survey report (Annex B3.2.3)
- Habitats and protected species desk study (Annex B3.2.6)
- Habitats Regulations Assessment (HRA) (Annex B3.3.3)
- Invasive and non-native species (INNS) survey report (Annex B3.2.4)
- Sediment report (Annex B3.2.5)
- Strategic Environmental Assessment (SEA) (Annex B3.3.1)
- Waterbody connections report (Annex B3.2.1)
- Water Framework Directive Assessment (WFD) (Annex B3.3.4)

This report forms the HRA update for Gate 2. Figure 1.2 below shows the integration of the statutory assessment reports (i.e. SEA, HRA, WFD, NCA/BNG) with the RAPID gated process. This schematic is taken from the All Companies Working Group (ACWG) guidance that was released in Gate 1. While this is still largely relevant and followed, it has been somewhat superseded by the RAPID Gate 2 guidance², which the Gate 2 assessments have followed.

Figure 1.2: Environmental Assessment Integration with SRO Gates³



² Strategic regional water resource solutions guidance for gate two, Regulators' Alliance for Progressing Infrastructure Development, February 2022, available online at https://www.ofwat.gov.uk/wp-content/uploads/2022/02/Strategic-regional-water-resource-solutions-guidance-for-gate-two_Feb_2022.pdf, accessed 09/02/2022.

1.3 Scheme description

The scheme is shown below in Figure 1.3 and described in detail in Annex A1, Engineering CDR (WSP, 2022). It will comprise a transfer rising from Minworth Wastewater Treatment Works (WwTW) to the Coventry Canal at the top of Atherstone lock flight. Once outside the Minworth site, and past the M42 and HS2 corridors, the rising main will pass through agricultural land until reaching the outskirts of Atherstone, a small market town within North Warwickshire. The rising main will discharge to the canal side at Coleshill Road, via a new discharge structure sized to avoid deleterious flow velocities and shears.

Transferred water will then progress along the Coventry Canal by gravity into the Oxford Canal at Hawkesbury Lock. Flows will need to bypass the Hawkesbury lock via a low lift pumping station.

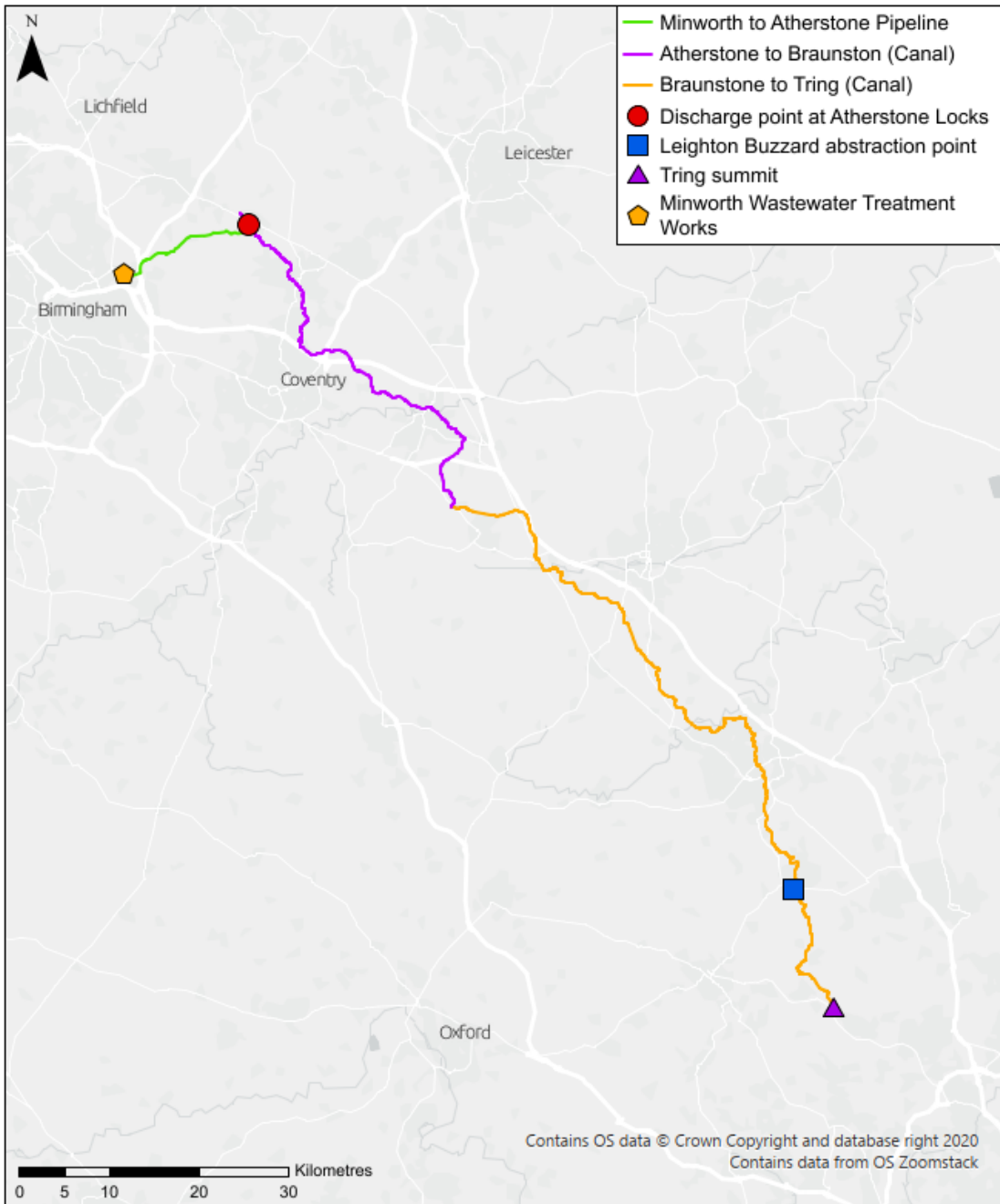
The Oxford Canal will then convey the water to the Grand Union Canal at Braunston. The majority of the flow along the Oxford Canal will be by gravity, however a pumping station will be required to bypass the locks at Hillmorton.

At Braunston a bypass pumping station will be required to lift flows from near Braunston Marina to the top lock just before Braunston Tunnel. From Braunston to the abstraction and treatment site at Leighton Buzzard, four additional lock bypass pumping stations will be required south of Milton Keynes at Fenny Stratford, Stoke Hammond, Three Locks and Leighton. The Grand Union Canal section will also require eight gravity bypasses around “downflow” locks at the Wilton Marine Lock Flight, Stoke Bruerne Lock Flight and Cosgrove Lock.

Flow will be abstracted from the Grand Union Canal just south of the A4146 bridge, after the River Ouzel. The site currently proposed at Gate 2 for the treatment works is on relatively flat land slightly raised from the river and canal, although further will be carried out at Gate 2/3 to determine the precise location. Flow will therefore need to cross the River Ouzel within a new, short pipeline and be pumped into an operational raw water storage reservoir before gravitating into the first stage of treatment. Additional interstage pumping in the treatment works will be required with final high lift pumps transferring potable treated water to a new clean water holding tank at the existing Chaul End Water Supply Reservoir (WSR).

During the option selection process, it was determined this option would have the least overall cost, lowest environmental impact and greatest opportunity for net gain and public benefit. The slightly higher operational cost when compared to Route 1, due to longer transfer from Minworth to Atherstone, can be partially offset by energy recovery from the break tank to outfall.

Figure 1.3: The scheme



1.4 Assumptions and Limitations

The following assumptions have been used within the assessment:

- The design assumptions stated in the WSP Gate 2 Position Paper - Route Selection technical note³ can be applied to the Gate 2 Environmental Assessments, including assumption that >50mm depth change requires towpath raising is valid.
- The assessment is based on a 'worst-case' 100% utilisation of the SRO.

³ Gate 2 Position Paper - Route Selection, WSP Technical Note, 25 January 2022

- Tring represents the SE limit of influence of the SRO.
- The volume of water passing NW (after discharging from pipeline) due to the locks opening at Atherstone is deemed to be of minimal change.
- The risk of fish and INNS travelling NW of Atherstone is not increased due to the scheme.
- The SEA has used desk-based GIS information and has been informed by the results of the other environmental assessments.

Information provided by third parties, including publicly available information and databases, is considered 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.

Any uncertainties and the limitations of the assessment process are acknowledged and highlighted. Recommendations for avoidance and mitigation measures 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 scheme progresses. This is expected to be through increasing the level of detail available during later stages of option development for subsequent gateways, if the relevant options are progressed.

2 The Purpose of this HRA

This HRA has been undertaken at Gate 2, in order to inform any likely impediments to the practicality or deliverability of the scheme. It delivers the duties upon Statutory Undertakers (in this case water utilities) with regard to ensuring that their works comply with the requirements of the Regulations, by ensuring that the potential effects of the scheme are fully considered at each Gate.

At later Gates, further consultation with the relevant competent authority and Statutory Nature Conservation Body (SNCB - Natural England) will be required and this report will form the basis of future iterations of the assessment, which will be updated when changes are made at later Gates

The competent authority will be required to determine whether the scheme will adversely affect the integrity of the site(s). The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was designated.

This report includes a review of the HRA Appropriate Assessment undertaken at Gate 1 for the preferred option in light of any changes to the design made after Gate 1 submission.

3 HRA Process and Methodology

3.1 HRA Process

There is a requirement under the Conservation of Habitats and Species Regulations 2017 (as amended) (“the 2017 Regulations”) to determine if a plan or project may have an adverse impact on a site designated under the same (or preceding Regulations) prior to any consent or permission being determined. The process of undertaking this assessment is known as a Habitats Regulations Assessment (HRA).

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 now known as the National Site Network. Within the UK, this network consists of Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), proposed and candidate SPAs and SACs (pSPAs and cSACs). This network also extends to marine environments, with Ramsar sites also treated equally within this assessment framework.

The Regulations are set out in Parts which implement the requirements of the Directives, with Part 2 including provisions for the selection and designation of sites and Part 6 providing provisions to ensure that assessment of plans and projects are fully considered before being granted consent or permission. They also define the nature of and roles of statutory bodies, competent authorities and the appropriate nature conservation body and the requirements for information to be submitted to these bodies to enable them to undertake the required assessments.

Although the 2017 Regulations have been amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, due to the UK’s exit from the EU, the effect of these amendments is largely related to wording and requirements and processes remain the same, as protection levels remain unchanged. As such existing EU guidance⁴ and preceding case law from the European Court of Justice (ECJ)^{5 6 7} remains valid as a source of direction and interpretation of the requirements of the legislation, although it should be noted that much case law has now been incorporated into guidance and/or best practice.

The HRA process consists of four stages, each stage being informed by the one preceding, to ensure an iterative and objective assessment. If the conclusion of Stage 1 Screening is that there will be no likely significant effects on any features of a European site, there is no requirement to undertake further stages. Similarly, if the Stage 2 Appropriate Assessment concludes there will be no adverse effect on integrity of the European site, then the assessment is concluded. The HRA stages are summarised within Table 3.1.

⁴ Managing Natura 2000 Sites - The provisions of Article 6 of the ‘Habitats’ Directive 92/43/CEE (European Communities 2020)

⁵ Landelijke Vereniging tot Behoud van de Waddenzee/ Nederlandse Vereniging tot Bescherming van Vogels, European Court of Justice, Case C-127/02 ‘Waddenzee 2002’

⁶ Sweetman et al v An Bord Pleanala, European Court of Justice, Case C-258/11 ‘Sweetman 2011’

⁷ People over Wind/Sweetman v Coillte Teorante, European Court of Justice Case C-323/17 ‘People over Wind 2017’

Table 3.1: HRA Stages

Stage	Description
Screening (Stage One)	<p>This is the process which identifies the potential effects upon the European sites and considers if these are likely to be significant (see definitions below).</p> <p>Screening is an iterative process and before moving to Stage Two it can be repeated if required.</p> <p>Proposals to mitigate any likely significant effects cannot be considered at the screening stage.</p> <p>If the Screening (Stage 1) identifies that the project or plan, alone or in combination, may have likely significant effects on a European 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.</p>
Appropriate Assessment (Stage Two)	<p>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 European site with respect to the site's structure, function and conservation objectives.</p> <p>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.</p> <p>A key outcome of the Appropriate Assessment is to identify whether the integrity of the European site(s) is likely to be adversely affected by the plan/project.</p>
Assessment of Alternative Solutions (Stage Three)	<p>If the mitigation measures applied and assessed during Appropriate Assessment cannot avoid adverse effects on the integrity of a European site, this stage examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European site.</p>
Assessment where no alternative solutions exist and where adverse impacts remain (Stage Four)	<p>If no suitable alternative solutions are available, Stage Four requires an assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest ("IROPI"), it is considered that the project or plan should proceed.</p> <p>In making this assessment, it is important to recognise that it will be appropriate to the likely scale, importance and impact of the proposed project. If it is impossible to avoid or mitigate the adverse impact, it must be demonstrated that there is IROPI.</p>

Source: Mott MacDonald, 2022

This assessment has been undertaken in an iterative and objective manner. It followed the above stages, with reference to best practice guidance and relevant case law, notably that provided by the Waddenzee case (ECJ 2002) and Sweetman (ECJ 2011) to inform the interpretation and therefore correct application of the terms 'likelihood, 'significance' and 'in combination'.

3.2 Assessment Methodology

3.2.1 Screening

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 Zone of Influence (ZoI), and any known areas of land outside the site boundary itself, which plays an important role in supporting the site and its features of interest (functionally linked land);
- Potential effects resulting from the plan or project;
- The ZoI of these effects, noting this may extend some distance from the site itself, it is not confined to activities on or adjacent to the site;
- Any viable pathways for the project (or plan) to the receptor (designated site itself or functionally linked land);

- The features of interest of the designated site(s) in question; and
- The conservation objectives of the designated site, including any site sensitivities given within any supplementary advice, site improvement plan, or equivalent document published by the relevant nature conservation body.

The above information was reviewed in respect of each feature of interest and potential development effect / impact pathway to inform an assessment of any likely significant effects. 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. 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 designated 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; and
 - Those which are actually proposed – defined by being a valid live planning application, or any referenced with a local plan where there is a strong likelihood of them being undertaken within a reasonable time period, specified within that plan.

In line with relevant case law, this assessment is undertaken in the absence of mitigation (including measures embedded into the scheme where these are intended for the avoidance of effects).

Where likely significant effects were identified the assessment has taken these effects through to appropriate assessment.

3.2.2 Appropriate Assessment

Where a plan or project is likely to give rise to Likely Significant Effect (LSE) upon a European Site(s), an assessment must be made of the implications on the integrity of that site in view of that site's structure, function and conservation objectives and taking into account any site specific supplementary advice or site improvement plan.

Where mitigation measures are to be applied to eliminate or reduce any effects identified in screening, these may be considered within the appropriate assessment.

Potential impacts may be direct or indirect and are dependent on the relationship between the source (proposed options' actions) and the receptor (the qualifying features of the Habitats Sites). The significance of an impact is relative to the sensitivity, existing condition and conservation status of the qualifying features of the site and the scale of the impact in space and time.

Potential effects on the qualifying features of the Habitats Sites 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.

This HRA Stage 2: Appropriate Assessment has been formulated using the following approach:

- Review the sites identified at Stage 1 and confirm any additions or exclusions⁸.
- Assessment of the construction and operation impacts of the scheme⁹.
- Assessment of the Habitats Sites' characteristics and identification of their conservation objectives¹⁰.
- Identification of the aspects of the proposed GUC options that will significantly impact the conservation objectives of the Habitats Sites¹¹.

This assessment has been undertaken in accordance with the following guidance:

- GOV.UK (2019) *Appropriate Assessment - Guidance on the use of Habitats Regulations Assessment*. Published 22 July 2019¹².
- UK Water Industry Research (UKWIR, 2021)¹³.
- European Commission (EU, 2018) *Managing Natura 2000 sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*¹⁴.
- Waterbird Disturbance and Mitigation Toolkit, (TIDE Tidal River Development 2022)¹⁵.

3.3 Consideration of Alternatives and IROPI

If it is concluded that significant effects are likely to remain after mitigation, there must be an examination of alternative ways to complete the plan or project that avoids significant effects on the integrity of the site (Stage 3: Consideration of alternatives). Where alternatives exist, these should be subjected to Stage 1 and Stage 2 assessments if required. Where no alternatives exist, it is necessary under Article 6(4) of the Habitats Directive to identify if there are or are no imperative reasons for overriding public interest (IROPI). If there are IROPI then compensatory measures must be assessed (Stage 4).

⁸ A map of the scheme in relation to these European Sites is given in Appendix A. The Stage 1 Screening results for the preferred GUC options are given in Appendix B; confirmation of any additions or exclusions are given in Section 5.1.

⁹ Given in Section 5.1

¹⁰ Habitats Sites characteristics and conservation objectives are given in Appendix C.

¹¹ This is the Appropriate Assessment given in Chapter 5 and tabulated in Section 5.3.

¹² Available at: [Appropriate assessment - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414447/AA-Guidance-2019.pdf)

¹³ *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15)*

¹⁴ Available at: https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/Provisions_Art_.nov_2018_endocx.pdf

¹⁵ Available at: [TIDE toolbox - TIDE tools \(tide-toolbox.eu\)](https://tide-toolbox.eu/)

4 HRA Stage 1: Screening Outcome

4.1 HRA Stage 1 - Screening Principles

The purpose of the Screening Stage (Stage 1) of the HRA is to identify the Likely Significant Effects that arise from the interaction between actions of the GUC options and sensitive receptors of a European Site through impact pathways.

A significant effect was considered 'likely' if it could not be excluded on the basis of objective information and there is potential to undermine a site's conservation objectives.

4.2 The WRSE Review

A screening exercise was undertaken by WRSE in February 2021¹⁶ in-line with the methodology found in the WRSE Regional Plan Environmental Assessment Methodology Guidance, July 2020. This summary reflects the assessment result of the option as it was described at the time. The following changes to the scheme change will be updated within the HRA Screening for this plan at a later Gate. A map of the scheme in relation to these European Sites is given in Appendix A.

The WRSE Stage 1 assessment included screening of the long-list of options considered for the GUC scheme. For the Upper Nene Valley SPA/Ramsar site, the justification for requirement of a Stage 2 HRA assessment is the identification of a hydrological connection from the GUC to the Habitats Site from the Wilton Brook/River Nene. The pathway has the potential to result in alterations to flow and water quality entering the Habitats Site.

For the Chiltern Beechwood SAC, although no hydrological connection has been identified, justification for the requirement of a Stage 2 assessment was due to the close proximity of the Tring intake, located in that assessment approximately 0.6km from the Habitats Site. However, the currently preferred option includes an intake at Leighton Buzzard approximately 10km away for this site. Therefore, effects are no longer anticipated from construction of the GUC Scheme. No further pathways are identified through which the site can be affected.

The outputs of this assessment for the preferred option currently considered for the GUC SRO are summarised in Table 4.1.

Table 4.1: Summary of WRSE HRA Stage 1 Screening Output – Likely Significant Effects and Uncertain Effects

Options Taken Forward	Sub-Route	Likely Significant Effects or Uncertain Effects
3B. Minworth WwTW to Tring	Route 3 (Minworth to Atherstone - Pipeline)	Chiltern Beechwood SAC Upper Nene Valley Gravel Pits SPA Upper Nene Valley Gravel Pits Ramsar site

¹⁶ WRSE (2020) Regional Plan, Strategic Environmental Assessment Scoping Report, Appendix F, available online at <https://www.wrse.org.uk/media/51vdwyw0/wrse-regional-plan-strategic-environmental-assessment-scoping-report.pdf>, accessed 05/05/2022. Note: As a result of comments received from Natural England, the Scoping Report is currently being revised and will be reissued for the next round of consultation, which is likely to be 2023.

5 HRA Stage 2: Appropriate Assessment Approach and Methodology

5.1.1 Consultation

It is a statutory requirement of the HRA process that as the competent authority Natural England be consulted at the Appropriate Assessment stage. Natural England has been engaged in the consultation phase during scoping works, Gate 1 and Gate 2 for the SRO and the RAPID deliverables will be made available after the Gate 2 submission.

5.2 Potential impacts considered as part of the HRA

Following UKWIR (2021) guidance and given the nature of the scheme, the potential impacts considered in this assessment are summarised in Table 5.1. Proposed distances are also provided following the same guidance to ascertain if, where a pathway has been identified, the impact is likely to affect the habitats or species for which the European Site has been designated. It should be noted that, in some cases, it was appropriate to use a larger Zol than defined in Table 5.1 for example, where a new pipeline crosses a watercourse that runs into a European Site, and where changes in water quality and quantity could affect habitats that are hydrologically connected.

Table 5.1: Potential impacts and proposed Zol

Broad categories of potential impacts on European sites (with examples)	Examples of operations resulting in impacts and proposed Zol
Physical loss Destruction (including offsite effects) eg. foraging habitat, smothering	Development of built infrastructure associated with the pipelines, access routes. Indirect effects from a reduction in flows for example. drying out of water-margin habitat. Physical loss is only likely to be significant where the boundary of the option extends within the boundary of the European Site, or within an offsite area of known foraging, roosting, breeding habitat (that supports species for which a European Site is designated or where natural processes link the option to the site, such as through hydrological connectivity downstream, long shore drift along the coast, or the scheme impacts the linking habitat).
Physical damage Habitat degradation Erosion Trampling Fragmentation Severance/barrier effects Edge effects	Development of built infrastructure associated with the scheme, e.g. reservoir embankments, water treatment plants, pipelines, pumping stations. Physical damage is likely to be significant where the boundary of the scheme extends within or is directly adjacent to the boundary of the European Site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat that supports species for which a European Site is designated, or where natural processes link the scheme to the site, such as through hydrological connectivity downstream of an option or sediment drift along the coast.
Non-physical disturbance Noise Visual presence Light pollution	Noise from temporary construction or temporary pumping 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 appropriate to use for this plan), it is concluded that noise impacts could be significant up to 1km from the boundary of the European site Noise from vehicular traffic during operation of the scheme Noise from construction traffic is only likely to be significant where the transport route to and from the scheme is within 3-5km of the boundary of the Habitat Site.

Broad categories of potential impacts on European sites (with examples)

Examples of operations resulting in impacts and proposed Zol

	<p>Plant and personnel involved in operation of the option</p> <p>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 European Site is designated</p> <p>Options that might include artificial lighting, e.g. for security around a temporary pumping station.</p> <p>Effects from light pollution are more likely to be significant where the boundary of the scheme is within 500m of the boundary of the European Site</p>
<p>Water table/ availability</p> <p>Drying</p> <p>Flooding/storm water</p> <p>Changes to surface water levels and flows</p> <p>Changes to groundwater level and flows</p>	<p>Change to water levels and flows due to water abstraction, storage and drainage interception .</p> <p>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 European Site. However, these effects are dependent on hydrological continuity between the scheme and the European Site and sometimes whether the scheme is up or downstream from the European Site.</p>
<p>Toxic contamination</p> <p>Water pollution</p> <p>Soil contamination</p> <p>Air pollution</p>	<p>Reduced dilution in downstream or receiving waterbodies due to changes in abstraction or reduced compensation flow releases to river systems.</p> <p>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 European Site. However, these effects are dependent on hydrological continuity between the scheme and the European Site, and sometimes whether the scheme is up or downstream from that Site(s).</p> <p>Air emissions associated with plant and vehicular traffic during construction and operation of the scheme.</p> <p>The effect of dust is only likely to be significant where site is within or in close proximity to the boundary of the European Site. Without mitigation, dust and onto the public road network and then deposited/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 protected site falls within 200m of the edge of a road affected.</p>
<p>Non-toxic contamination</p> <p>Nutrient enrichment (e.g. of soils and water)</p> <p>Algal blooms</p> <p>Changes in turbidity</p> <p>Changes in sedimentation/silting</p> <p>Air pollution (dust)</p>	<p>Changes to water salinity, nutrient levels, turbidity, thermal regime due to increased water abstraction, discharges, storage, or reduced compensation flow releases to river systems.</p> <p>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 European Site. However, these effects are dependent on hydrological continuity between the scheme and the European Site, and sometimes whether the option is up or downstream from the Site(s).</p> <p>Emissions of dust during the earthworks, construction of plant and tunnel/pipeline construction associated with options.</p>
<p>Biological Disturbances</p> <p>Direct mortality</p> <p>Changes to habitat availability</p> <p>Changes in species abundance or distribution</p> <p>Out-competition by non-native species</p> <p>Introduction of disease</p> <p>Introduction of invasive species</p>	<p>Killing or injury due to construction activity.</p> <p>Likely to be a risk where the boundary of the scheme extends within or is directly adjacent to the boundary of the European Site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a European Site is designated).</p> <p>Creation of new pathway for spread of non-native invasive species.</p> <p>This effect is only likely to be significant where the scheme is situated within the European Site or an upstream tributary of the European Site, but also for inter-catchment water transfers.</p>
<p>Physical loss</p>	<p>Development of built infrastructure associated with the pipelines, access routes.</p>

Broad categories of potential impacts on European sites (with examples)	Examples of operations resulting in impacts and proposed Zol
Destruction (including offsite effects) e.g. foraging habitat, smothering	Physical loss is only likely to be significant where the boundary of the option extends within the boundary of the European Site, or within an offsite area of known foraging, roosting, breeding habitat (that supports species for which a European Site is designated).

Source: Adapted from: UK Water Industry Research (2021)¹⁷.

5.3 Assumptions and standard best-practice mitigation measures

5.3.1 Overview

The high-level nature of this assessment undertaken at the plan stage means that there is some lack of detailed design for the scheme. 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.

Based on the current level of detail available for the scheme, a number of assumed and established mitigation measures are proposed with the assumption that they will be followed at later stages to avoid or mitigate the effects identified in this HRA. 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 impacts in so far as is reasonably possible. These measures should be applied unless the project stage HRAs or option-specific environmental studies demonstrate that they are not required (i.e. the anticipated effect will not occur), not appropriate, or that alternative or additional measures are necessary or more appropriate. Note that these mitigation measures must be reviewed at later stages, taking into account any changes in best-practice as well as option-specific survey information or baseline studies.

It is recommended that Severn Trent and Affinity Water work closely with Natural England and the European Site 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 with supervision from an Environmental Clerk of Works.

5.3.2 Assumptions during construction

The assumptions made on the mitigation measures for the scheme design, pollution control, biosecurity, disturbance, and the Construction and Environmental Management Plan (CEMP) are:

Scheme design

- Should design be altered, every opportunity for avoiding potential effects on European Sites (e.g. through alternative pipeline routes, micro siting, etc.) should be taken.
- Construction of new pipeline at watercourse crossings, where the watercourse is in hydrological continuity with a European Site will be carried out using directional drilling to avoid direct impacts on riverbed and permanent habitat loss.

¹⁷ UK Water Industry Research (UKWIR, 2021). *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15)*

- Pipeline routes will be sufficiently distant to watercourses and designated sites boundaries to offer a buffer limiting pathways through disturbance and pollution runoff.

Pollution control

- Indirect construction-related pollution is identified as one key pathway through which European Sites may be affected. There is numerous guidance on environment 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)¹⁸
 - Environment Agency's Pollution Prevention Guidance Notes¹⁹ including PPG1: *General Guide to Prevention of Pollution* (May 2001); 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 spillages on highways* (June 2002).
- The installation of sediment traps near or in watercourses or the use of cofferdams should be specified at the project stage.

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:
 - 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 Clerk of Works and INNS brief given to all site contractors.
 - Where a species requires long-term management (such as Japanese knotweed *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 C679²⁰ '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.
- Programme activities likely to result in disturbance to breeding birds outside of the bird breeding season, in the period April to mid-September inclusive.
- Programme activities likely to result in disturbance to wintering birds outside of the period October to March inclusive.

¹⁸ Charles P. and Edwards P (2015) *Environmental good practice on site guide*. CIRIA C741, 260p.

¹⁹ 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.

²⁰ Booy, O., Wade, M. and White, V. (2008) Invasive species management for infrastructure managers and the construction industry. CIRIA C679.

- Construction related noise disturbance can be further minimised by implementing best practice such as BS 5228-1:2009+A1:2014 (The British Standards Institute, 2008)²¹.

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 potential suitable habitat, 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 Professionals, 2011)²².

Construction Environmental Management Plan

A CEMP must be developed prior to construction, including measures to ensure that the risk of uncontrolled discharges from construction is reduced (including sediment management) and detailing an Emergency Response Plan in the event of a pollution incident. This plan must be prepared for all works and include measures listed above and additional ones identified during the project HRA.

5.3.3 Assumptions during operation

New raw water intakes are assumed to be undertaken under licenced limits.

The water treatment level will need to be appropriate to avoid the risk of spreading INNS and pathogens, this will be identified at the project stage informed by a baseline study. Refer to lead Annex B3.2.4, section 4 “*Invasive Non-Native Species Risk Assessment*”

²¹ 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.

²² Institution of Lighting Professionals (2020) Guidance note for the reduction of obtrusive light. Guidance Note1/20.

6 Appropriate Assessment of the GUC Options

6.1 Likely Impact Pathways and potential effects

The potential impacts (of construction and operational phases) on these sites are described below. A map of the scheme in relation to these European Sites is given in Appendix A. Considering the type, size and scale of the scheme, the Stage 1 Screening assessment has been reviewed and the European Sites identified with potential for Likely Significant Effects or Uncertain Effects is given in Appendix C.

6.1.1 Construction Effects

The scheme proposes taking water from the existing Minworth WwTW for conveyance to an abstraction point at Leighton Buzzard, via the GUC. In order to transfer water to the GUC, a pipeline will be constructed between Minworth WwTW and the discharge point on the canal network at Atherstone. Based on the current design information, there are no European Sites in hydrological continuity with the new pipeline corridor and no European Sites located in the range for any construction-related disturbance or pollution effects to be considered. Transferred water will then progress along the Coventry Canal by gravity into the Oxford Canal at Hawkesbury Lock. Flows will need to bypass the Hawkesbury lock via a low-lift pumping station. The Oxford Canal will then convey the water to the GUC at Braunston.

Below Braunston, the proposed route follows existing GUC to convey the water to the proposed abstraction location just south of the A4146 bridge, after the River Ouzel in proximity to Leighton Buzzard.

Flow will need to cross the River Ouzel within a new, short pipeline and be pumped into an operational raw water storage reservoir before gravitating into the first stage of treatment. Additional interstage pumping in the treatment works will be required with final high lift pumps transferring potable treated water to a new clean water holding tank at the existing Chaul End Water Supply Reservoir (WSR).

The new intakes are likely to require in-channel construction works on the GUC. In-channel works can result in temporary habitat degradation through, for example, runoff from accidental pollution events or dust emissions from construction-related activities. There is also potential for increased sedimentation and silting as a result of construction activities. These impacts are only considered relevant to a HRA if the impacted watercourse is in hydrological continuity with a European Site. In the case of the scheme, there are no European Sites in hydrological continuity downstream of the proposed intake locations before it feeds into the River Thames. Therefore, any impacts through in-channel construction at the proposed new intakes are not considered further in this assessment.

Chiltern Beechwood SAC is located approximately 10km from Leighton Buzzard intake on the western side of the GUC. The distance and the fact that the site is not in hydrological connection with the designated site results in no likely significant effects during construction as no pathway exists for these to occur. Consequently, further assessment is not required.

6.1.2 Operational Effects

The operation of the scheme will see up to 100MI/d of treated effluent being conveyed from Minworth WwTW to the GUC for abstraction at Leighton Buzzard. The new water input has the potential to result in temporary increases in surface water levels and flows resulting in water

quality changes and alterations to hydrologic/hydraulic processes. Thus, there is potential that changes caused by the transfer could cause deterioration of the GUC and other waterbodies in hydraulic continuity with the GUC, although it is acknowledged that discharge standards for key substances or parameters would need to be agreed and that work within subsequent Gates will progress this.

Water transfers always introduce a risk of spreading INNS, for example by introducing pathogens and fish disease if present at the source. It is assumed that the water will be treated at Minworth WwTW to a sufficient standard to ensure removal of any INNS before discharge into the GUC. However, it is acknowledged that INNS will have already colonised canals and rivers in the study area by virtue of existing interconnection and navigational use and that the scheme could result in an increase of this colonisation.

These operational impacts are only considered relevant to the HRA if the impacted watercourse is in hydrological continuity with a European Site. Based on the current WFD Level 1 assessments²³, only one European Site has been identified with potential hydrologic connectivity to the GUC scheme that might be affected by water quality changes, namely the Upper Nene Valley Gravel Pits SPA/Ramsar site. This potential impact is therefore relevant to the scheme. The INNS risk assessment for this scheme identified a minor risk of spreading INNS due to the increase in flows along the GUC while the scheme is in operation. Section 5.3 identifies standard biosecurity measures that will be used during construction and operation to mitigate this effect. Further engineering solutions to minimise the spread of INNS, which could affect the designated sites including incorporation of biosecurity measures into the transfer design and an operational protocol may also be required. As a recommendation following the INNS risk assessment²⁴ further studies including summer surveys will be required to further define the risk.

The GUC meets the River Nene at Northampton (from the Northampton Arm of the GUC) and the Upper Nene Valley Gravel Pits SPA/Ramsar site is located approximately 10km downstream on the Nene from the junction with the GUC. The Gate 2 Waterbody Connections Report²⁵ notes that connection exist between the GUC and River Nene at Whitton Flood Paddle and Stow Flood Paddle, however discussion with Affinity Water and the Canal and River Trust have indicated that a sluice lockage and bypass flow system is in place, which limits the overspill of water from the GUC. Changes in water quality will be minimised by the required treatment of water at Minworth WwTW to acceptable water standards, and as is the nature of the water transfer, it is assumed that there will be mechanism put in place to ensure the increased flow will not be utilised by the Northampton Arm, rather southwards towards the proposed new intakes. The presence of the lockage system where the GUC feeds the River Nene also reduces the likelihood that any changes in water quality as a result of the scheme will result in adverse effects on the Upper Nene Valley Gravel Pits SPA/Ramsar site. Any such impacts relating to the introduction of INNS to lengths of canal/ river channel not previously colonised are similarly unlikely on the Upper Nene Valley Gravel Pits SPA/Ramsar site.

There are no further European Sites likely to be affected by the operation of the GUC options.

²³ Please note that the limitations section of the WFD Level 1 report indicates that a more complete dataset on existing connectivity between canals and river waterbodies through the whole system is needed to confirm hydrological connections from the GUC at future gate stages.

²⁴ Annex B3.2.4 Invasive and Non-native Species Risk Assessment, Mott MacDonald 2022, document reference 100105044 | GUC-MMD-ZZZ-XX-RP-N-0004 | C |

²⁵ Annex B3.2.1 Waterbody Connections Report, Mott MacDonald 2022, document reference GUC-MMD-ZZZ-XX-RP-N-0001.

6.2 Potential Effects on European Sites Alone

No pathways have been identified through which European Sites could be affected by the implementation of the scheme. Therefore, an Appropriate Assessment is not required.

6.3 Potential Effects on European Sites In-combination

An initial in-combination effects assessment has been undertaken as part of the HRA update for the Gate 2 submission for the scheme. It is understood that if the scheme is selected as an option in the WRSE Regional Plan and Affinity WRMP24 it will be subject to further in-combination effects assessment with the other selected options, neighbouring water companies plans and neighbouring regional plans. Until the WRSE Best Value Regional Plan has been developed and agreed, it is not known when the scheme would be implemented, and therefore, which other developments it could act in-combination with it. Therefore, for the purposes of this in-combination effects assessment it has been assumed that the scheme would be implemented at the same time as the other developments considered.

The following plans, programmes and projects have been considered within this in-combination effects assessment:

- Other SROs - Abingdon reservoir, London effluent reuse, South Lincolnshire reservoir, Fawley desalination, River Itchen effluent reuse, Vyrnwy reservoir, Minworth effluent reuse source, United Utilities sources, West Country south sources (and associated transfers), Severn Trent Water sources, West Country north sources (and associated transfers), River Severn to River Thames transfer Joint solution, Thames Water – Southern Water transfer.
- Development Consent Order (DCO) Schemes (Within 10km buffer, based on HRA ZoI, information taken from National Infrastructure Planning website²⁶) - M42 Junction 6 Improvement, Daventry International Rail Freight Terminal, Northampton Gateway Rail Freight Interchange.
- Hybrid Bills – High Speed Two (HS2).
- Local Development Frameworks – North Warwickshire Local Plan, Birmingham Development Plan, Solihull Local Development Plan, Aylesbury Value Local Plan, Central Bedfordshire Local Plan, Dacorum Local Plan.

Other proposed schemes and developments, including non-DCO schemes such as the Bedford and Milton Keynes Waterway Park under development by the Environment Agency and Water Resource East (WRE), will not be included within this in-combination assessment. As set out in section 3.1, until the WRSE Best Value Regional Plan has been developed and agreed, it is not known when the scheme would be implemented, and therefore, which other developments could act in-combination with it. The in-combination assessment has therefore been limited to the above large developments; a more detailed assessment including smaller developments will be carried out during further assessment to be carried out at later Gates.

As no pathways have been identified that could result in an effect alone, there is also no potential for cumulative effects from other plans or projects proposed in the ZoI of the scheme. No further assessment is required.

6.4 Summary of the GUC Scheme Appropriate Assessment

Provided that all recommendations in this report are followed (including further studies to inform INNS mitigation measures), no adverse effects resulting from the implementation of the scheme

²⁶ [National Infrastructure Planning \(planninginspectorate.gov.uk\)](https://planninginspectorate.gov.uk), date accessed 3rd March 2022.

are reasonably foreseeable on the features of interest of the following European Sites, due to the lack of pathways between the GUC Scheme components and the following designated sites:

- Chiltern Beechwood SAC
- Upper Nene Valley Gravel Pits SPA/Ramsar

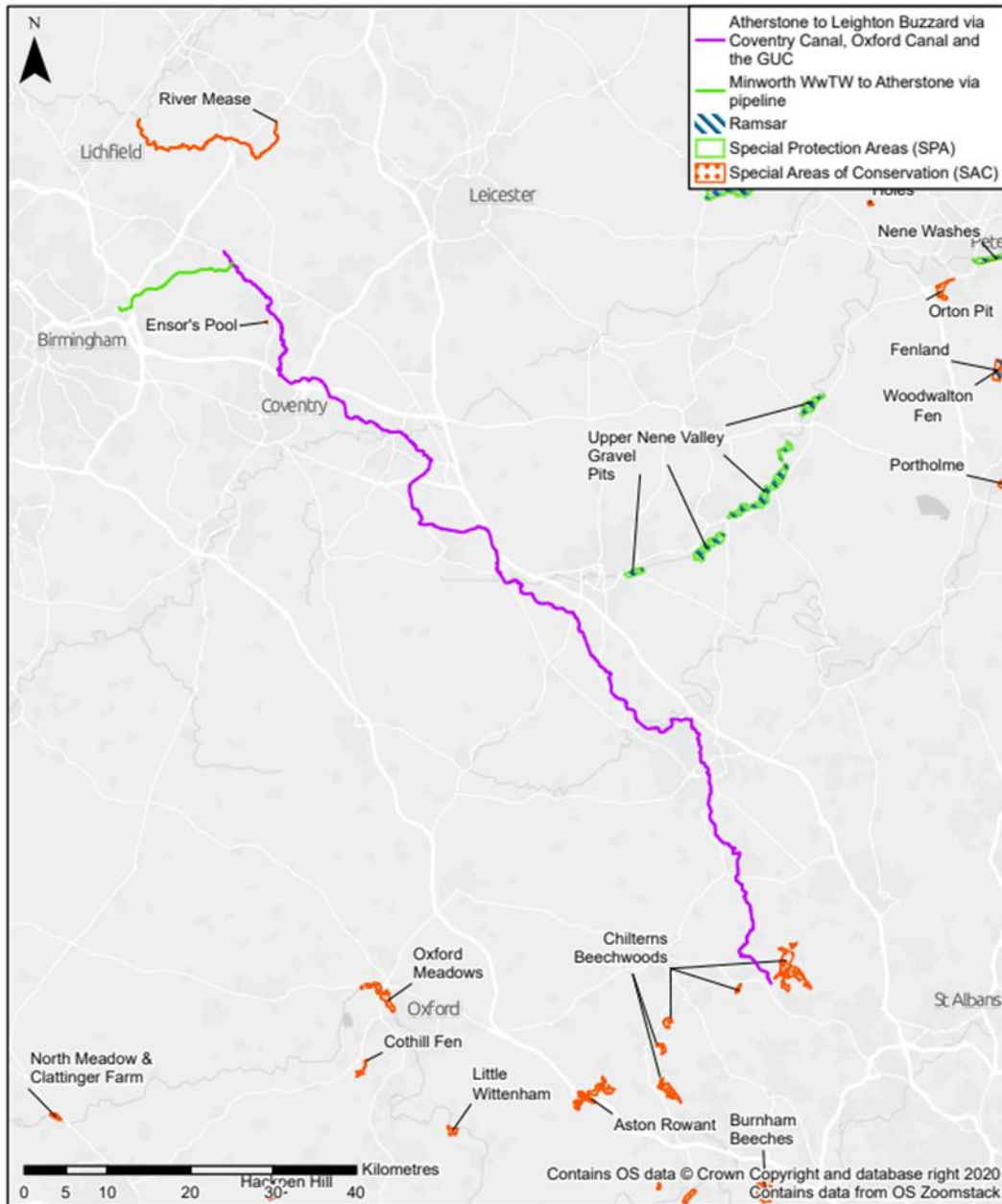
In conclusion, the plan is considered unlikely to have an adverse effect on integrity on the European Sites and therefore no further stages in the HRA process will be necessary for the scheme.

7 Conclusions

The scheme has been subject to a HRA Stage 1 assessment, which was completed by WRSE. Subsequently, a HRA Stage 2 Appropriate Assessment (plan stage) has been undertaken which addressed changes in the scheme design. The HRA Stage 2 Appropriate Assessment did not identify any options that, if implemented (alone and in-combination with other plans or projects), would result in any adverse effects on integrity of any European Protected Site. No further assessment is required.

A. Maps

Map A.1: Scheme layout in relation to European Sites



Note: Although the abstraction point will be at Leighton Buzzard, flow effects may be felt as far southeast as Tring, which is therefore shown within the scheme extent on the above map.

B. HRA Screening results

Table B.1: GUC Preferred option – HRA screening results

Option ID Number	Option Title	Option Description	Natura 2000 Sites Assessed (inc distances)	Qualifying Features	SSSI Condition Assessment	Screening Result	Justification for Assessment
3B	GUC SRO transfer - Tring Construction & Operation	GUC SRO transfer – Tring Construction & Operation – via Route 3 (Minworth to Atherstone pipeline followed by Coventry canal, Oxford Canal, GUC)	Ensor's Pool SAC 1km east from the nearest section of the transfer (canal) 95.6km from the abstraction point	Annex I habitats that are a primary reason for selection of this site Not Applicable Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site Not Applicable Annex II species that are a primary reason for selection of this site 1092 White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i> Annex II species present as a qualifying feature, but not a primary reason for site selection Not Applicable	Ensor's Pool SSSI: Favourable - 0.00% Unfavourable - Recovering - 0.00% Unfavourable - No change - 0.00% Unfavourable - Declining - 100.00%	No Likely Significant Effects	No apparent hydrological connection from map. Largely separated from the GUC by urban area. Extreme distance from the abstraction point, no LSE at this distance.
		GUC SRO transfer – Tring Construction & Operation – via Route 3 (Minworth to Atherstone pipeline followed by Coventry canal, Oxford Canal, GUC)	Upper Nene Valley Gravel Pits Ramsar 7.8km north east of the GUC 47.5km from the abstraction point	Ramsar criterion 5 Regularly supports 20,000 or more waterbirds. In the non-breeding season, the site regularly supports 23,821 individual waterbirds (5 year peak mean 1999/2000 – 2003/04). Ramsar criterion 6 Regularly supports 1% of the individuals in the populations of the following species or subspecies of waterbird in any season. Mute swan <i>Cygnus olor</i> 629 individuals – wintering. 5 year peak mean 1999/2000 – 2003/04 – 1.7% Britain Gadwall <i>Anas strepera</i> 773 individuals – wintering. 5 year peak mean 1999/2000 – 2003/04 – 2.0% strepera NW Europe (breeding)	Upper Nene Valley Gravel Pits SSSI: Favourable - 1.49% Unfavourable - Recovering - 48.48% Unfavourable - No change - 50.03% Unfavourable - Declining - 0.00%	Uncertain Effects	Hydrological connection from the GUC downstream along Wilton Brook/River Nene. No construction nearby but alterations to flow and water quality could have significant effects on the N2k site.
		GUC SRO transfer – Tring Construction & Operation – via Route 3 (Minworth to Atherstone pipeline followed by Coventry canal, Oxford Canal, GUC)	Upper Nene Valley Gravel Pits SPA 7.8km north east of the GUC 47.5km from the abstraction point	Article 4.1 Qualification Used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season: Bittern <i>Botaurus stellaris</i> 2 individuals – wintering. 5 year peak mean 1999/2000 – 2003/04. 2% of GB population. Golden plover <i>Pluvialis apricaria</i> 5790 individuals – wintering. 5 year peak mean 1999/2000 – 2003/04. 2.3% of GB population. Article 4.2 Qualification Used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season: Gadwall <i>Anas strepera</i> (migratory species) 773 individuals – wintering. 5 year peak mean 1999/2000 – 2003/04. 2% of strepera subspecies/population in NW Europe (breeding).	Upper Nene Valley Gravel Pits SSSI: Favourable - 1.49% Unfavourable - Recovering - 48.48% Unfavourable - No change - 50.03% Unfavourable - Declining - 0.00%	Uncertain Effects	Hydrological connection from the GUC downstream along Wilton Brook/River Nene. No construction nearby but alterations to flow and water quality could have significant effects on the N2k site.

Option ID Number	Option Title	Option Description	Natura 2000 Sites Assessed (inc distances)	Qualifying Features	SSSI Condition Assessment	Screening Result	Justification for Assessment
		GUC SRO transfer – Tring Construction & Operation – via Route 3 (Minworth to Atherstone pipeline followed by Coventry canal, Oxford Canal, GUC)	Chiltern Beechwoods SAC 0.6km east of the Grand Union Canal at the closest point. ~0.8km from proposed Tring abstraction point.	<p>Annex I habitats that are a primary reason for selection of this site 9130 <i>Asperulo-Fagetum</i> beech forests</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites)</p> <p>Annex II species that are a primary reason for selection of this site Not Applicable</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection 1083 Stag beetle <i>Lucanus cervus</i></p>	Ashridge Commons and Woods SSSI: Favourable - 86.33% Unfavourable - Recovering - 13.67% Unfavourable - No change - 0.00% Unfavourable - Declining - 0.00%	Uncertain Effects	<p>No hydrological connection, no cause of increase in water levels to the dry grassland.</p> <p>Construction is 0.6km from designated site and uncertainty whether associated intake infrastructure will be required in close proximity to the SAC.</p> <p>No direct cause to losses of important sites to stag beetles, i.e. rotten mature trees or habitat loss and no land take from beech forests or cause for enrichment.</p> <p>There may be potential for disturbance-related effects from construction through noise, vibration and air emissions given the close proximity of the site.</p>

C. Designated Site Information

C.1 Chiltern Beechwood SAC

C.1.1 Site description

The Chilterns Beechwoods represent a very extensive tract of ancient semi-natural beech *Fagus sylvatica* forests in the centre of the habitat's UK range. The woodland is an important part of a mosaic with species-rich chalk grassland and scrub. A distinctive feature in the woodland flora is the occurrence of the rare coralroot *Cardamine bulbifera*. Standing and fallen dead timber provide habitat for dead-wood (saproxylic) invertebrates, including stag beetle *Lucanus cervus*.

The issues and threats identified in the Site Improvement Plan are indicated in Table C.2.

Table C.2: Chiltern Beechwood SAC Pressures and Threats

Priority & Issue	Pressure or Threat	Features Affected
Forestry and woodland management	Pressure/Threat	H9130 Beech forests on neutral to rich soils
Deer	Pressure/Threat	H9130 Beech forests on neutral to rich soils
Changes in species distributions	Threat	S1083 Stag beetle
Invasive species	Pressure/Threat	H9130 Beech forests on neutral to rich soils
Disease	Threat	H9130 Beech forests on neutral to rich soils
Public Access/Disturbance	Threat	S1083 Stag beetle
Air Pollution: impact of atmospheric nitrogen deposition	Pressure	H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites), H9130 Beech forests on neutral to rich soils, S1083 Stag beetle

C.2 Qualifying features

Qualifying habitats

The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- *Asperulo-Fagetum* beech forests. (Beech forests on neutral to rich soils)
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*). (Dry grasslands and scrublands on chalk or limestone)

Qualifying species

The site is designated under article 4(4) of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Stag beetle (*Lucanus cervus*)

7.1 Conservation Objectives

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.

