MOTT MACDONALD

Northumbrian Water - Water Resources Management Plan 2024

Environmental Report - Appendix F

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Environmental Report - Appendix F

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Executive Summary

This report presents the results of the Habitats Regulations Assessment (HRA) Stage 2 Appropriate Assessment (AA) undertaken for NW Resource Management Plan 2024 (WRMP 24). It assesses the potential adverse effects of 'Supplying Teesside Industrial Water' Option on sites in the UK's National Site Network (hereafter referred to as 'Habitats Sites') including Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. Mott MacDonald Ltd undertook this HRA and plan level AA following the methodology in the *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15)*.

Water companies have a statutory obligation to produce a Water Resources Management Plan (WRMP), which sets out how a company intends to maintain the balance between supply and demand for water over a minimum 25-year period. In the development of a WRMP, companies must follow the Water Resource Planning Guideline (WRPG). WRMPs should ensure a secure and sustainable supply of water, focus on efficiently delivering the outcomes that customers want, while reflecting the value that society places on the environment.

Demand management is a priority for NW. In developing their WRMP, NW has first considered what could be offset by utilising demand management, before seeking to develop supply-side Options. Despite this ambitious demand management strategy, NW initially considered that the scale of the challenge could still require carefully targeted investment in supply-side capacity. As a result, five feasible supply Options were initially developed. However, following modelling to determine the likely deficit of water availability in the Northumbrian Water Region, a final plan supply surplus was forecast, demonstrating that there was no requirement for physical supply Options to be included in NW's WRMP. Consequently, it was originally proposed that NW's Best Value Plan would only include their preferred demand management package and a Yorkshire Water transfer Option, which is required by Yorkshire Water's Best Value Plan to meet their water supply requirements. However, as a result of updated modelling, NW have since proposed a new supply-side Option to be taken forwards as part of their Best Value Plan – The 'Supplying Teesside Industrial Water' Option.

Following HRA AA and having examined all the potential effects in the light of the Habitats Sites' conservation objectives and at this stage (the plan making stage) taking a precautionary approach to assessment and assuming that all proposed mitigation measures are implemented it is considered that this Option would not result in adverse effects on the integrity of any Habitats Sites during the construction phase.

Adverse effects during the operation phase cannot be excluded at this stage. Further hydrological modelling to inform the assessment is required to ensure flow requirements downstream of abstraction location are still met under scheme so that it does not result in adverse effects on the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar Site.

On a precautionary basis, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Detailed investigation into the effects of the proposed abstraction to fully understand changes water quality and flows and its extent.
- A hydrogeological assessment will be required to assess environmental flows if abstraction is above current licence limits.

The Option is expected to be in operation from 2027/2028. There is, therefore, sufficient time for the studies to be completed before a detailed project design is brought forward for re-assessment under the Habitats Regulations at the project level to inform the EIA.

The importance of establishing robust programmes of investigation is recognised, conducting further research, and implementing effective mitigation measures to proactively address adverse effects. These actions will reinforce the plan's positive effects on biodiversity and environmental well-being. The findings indicate that the successful implementation of the WRMP24 and the achievement of its intended positive outcomes are contingent on the diligent and full adherence to the identified mitigation measures and in line with guidance.

F.1 Introduction

F.1.1 Overview

F.1.1.1 Water companies in England and Wales are required to produce a Water Resources Management Plan (WRMP) every five years. The plan sets out how the company intends to maintain the balance between supply and demand for water over the long-term planning horizon to ensure security of supply in each of the water resource zones making up its supply area.

F.1.1.2 NW is within the Water Resources North (WReN) regional planning area. In the development of a WRMP, companies in England and Wales must follow the Environment Agency (EA) Water Resources Planning Guideline (WRPG) and consider broader government policy objectives. The guideline highlights that, where required, companies must carry out a Strategic Environmental Assessment (SEA) for their WRMP.

F.1.1.3 As part of the environmental assessment process to support the development of the WReN Regional Plan and NW WRMP 2024 'WRMP24', a Habitats Regulations Assessment (HRA) Test of Likely Significance (ToLS) was undertaken on the constrained list of water resource Options (that is those that were considered suitable for inclusion into the plan), to identify Options with potential likely significant effects (LSE) on Habitats Sites. Preferred Options were grouped to form a 'Best Value Plan' (BVP) and the ones identified as having potential for LSE during the ToLS were taken forward for the next stage of the HRA process, the Appropriate Assessment (AA).

F.1.2 The purpose of the Habitats Regulations Assessment

F.1.2.1 This HRA has been undertaken for NW WRMP24, to inform any likely impediments to the practicality or deliverability of the Options being taken forward. It delivers the duties upon Statutory Undertakers (in this case water utilities) to ensure works comply with the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations) by ensuring that the potential effects of the plan's Options are fully considered and mitigated.

F.1.2.2 Further consultation between the relevant competent authority (NW) and the Statutory Nature Conservation Body (SNCB) (Natural England), will be required to support the identified mitigation measures during project stage.

F.1.2.3 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.

F.1.3 Assumptions and limitations

F.1.3.1 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.

F.1.3.2 Any uncertainties surrounding, and 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 design of the BVP Option progresses. This is expected to be through increased level of available detail at later stages of Option development. A project level HRA may be required as appropriate.

F.1.3.3 The environmental assessment and the assessment of cumulative effects provided primarily focusses on schemes up to 2040, with schemes post-2040 considered on a lighter touch. This is because post-2040 there is less certainty in predicted status or condition of the environment and any assessments would be undertaken in an overly precautionary manner.

F.2 Options Description

F.2.1 Options description and site locations

F.2.1.1 Assessments have been conducted for the one Option shortlisted under the 'Best Value' planning process. To determine appropriate plan Options, NW adopted a planning approach that uses least-cost optimisation as well as broader criteria for 'best value' decision making, including:

- Cost to build and operate the plan
- Adaptability and flexibility of the plan to cope with uncertain future needs
- Alignment to the Water Resource North regional strategy
- Resilience of the plan to severe and extreme drought and other hazards, and the residual risks
- Deliverability of the plan with timescales needed to manage risks
- Alignment to customer preferences
- Environmental and social impacts of the plan, including net environmental benefit

F.2.1.2 Demand management is a priority for NW. In developing the WRMP, NW has first considered if water availability could be offset from demand management, before seeking to develop supply-side Options. Although the demand management strategy is ambitious it must also be deliverable and therefore carefully targeted investment in supply-side capacity is still required. The supply-side Option considered for inclusion in the WRMP 24 has been developed following industry and regulator guidance.

F.2.1.3 The HRA and other environmental studies undertaken were used as part of the decision-making criteria on environmental and social impacts of the plan to develop the BVP. The BVP provides the best value for customers in the long term whilst considering environmental and social metrics such as SEA performance, embodied carbon, biodiversity net gain, and other aspects.

F.2.1.4 In this HRA AA report, six Options across the BVP, OFWAT Core Plan, BESP, and adaptive programmes are analysed. Table 2.1 summarises all Options considered in this report and identifies the one that was submitted to HRA process, as well as specifying the specific plans in which the Options are included.

F.2.1.5 Supplying Teesside Industrial Water Option is the only Option included in the BVP. Whilst AAs would be required for all five other Options, these Options have not been proposed as part of the WRMP24. Therefore, no further assessments are needed at this stage. Should these Options be taken forward as part of future WRMPs, AAs must be undertaken.

Table 2.1: Options overview

Option ID / Name	Plan	Option Description	Screening Result
Supplying Teesside Industrial Water	BVP	The 'Supplying Tees Industrial Water' Option involves increasing the Blackwell abstraction licence back to pre- 2016 volumes (58,075 Ml/yr, 159 Ml/d), along with installing Eel Regs compliant eel screens at the Low Worsall intake	Potential for likely significant effects concluded for Teesmouth and Cleveland Coast SPA and Teesmouth and Cleveland Coast Ramsar Site due to changes in flow, physical damage, toxic contamination, non-toxic contamination and

Option ID / Name	Plan	Option Description	Screening Result
		and increasing the Low Worsall abstraction licence to 170Ml/d, with an annual limit of 62,000Ml (170*365days).	biological disturbances during operation.
BOT-ABS-002 New Borehole at Duddo	Not included as part of the WRMP24	Abstraction from a new borehole in Duddo, a transfer in a new pipeline to Felkington Mains, and a transfer using existing pipelines to discharge to Murton WTW. The new transfer pipeline length is approximately 2.1 km.	Potential for likely significant effects concluded for River Tweed SAC and Tweed Estuary SAC due to changes to water flow, contamination, and biological disturbance during operation. No likely significant effects were concluded for the other seven sites.
BOT-ABS-007 Fosberry Borehole Abstraction	Not included as part of the WRMP24	Recommission / refurbishment of a disconnected borehole. Transfer to Wooler WTW. No network reinforcement is required. 2 M/d WTW expansion at Wooler WTW to accommodate the additional flow. This may require BOT-TRA-004 to move the water to the Berwick area.	Potential for likely significant effects concluded for the River Tweed SAC, due to changes to water flow, contamination, and biological disturbance during operation. No likely significant effects were concluded for the other four sites.
BOT-TRA-001 Warkworth WTW to Berwick Upon Tweed Transfer	Not included as part of the WRMP24	Transfer from Warkworth WTW to Spring Hill Service Reservoir. The transfer length is approximately 56.7 km.	Potential for likely significant effects concluded for Northumberland Marine SPA. Lindisfarne Ramsar, Northumberland Coast SPA, Berwickshire & North Northumberland Coast SAC, North Northumberland Dunes SAC, and Lindisfarne SPA, due to the proximity of machinery causing anthropogenic and biological disturbance during the construction phase, as well as potential contamination and changes to the water table. No likely significant effects were concluded for the other eight sites.
BOT-TRA-002 Warkworth Network to Berwick Upon Tweed Transfer	Not included as part of the WRMP24	Cross connection between the Warkworth and Berwick Upon Tweed networks to transfer water from Warkworth WRZ to Berwick Upon Tweed WRZ. Includes the reinforcement of existing networks, and the length is approximately 13.7 km.	Potential for likely significant effects concluded for the River Tweed SAC and Northumberland Marine SPA SAC, due to contamination and the proximity of machinery causing anthropogenic and biological disturbance during the construction phase, and changes to the

Option ID / Name	Plan	Option Description	Screening Result
			water table during operation. No likely significant effects were concluded for the other 10 sites.
BOT-TRA-004 Watchlaw to Murton Transfer	Not included as part of the WRMP24	Transfer from Wooler to Murton WTW, using existing pipes from Wooler to Milfield. A pipe replacement is required from Milfield to A697/B648670 junction and a pipe reinforcement is required between A697/B648670 junction and River Till crossing and Ford PS. A new pipeline is required from Ford to Murton WTW. The transfer length is approximately 9.66 km.	Potential for likely significant effects concluded for the River Tweed SAC, due to contamination and biological disturbance during operation. No likely significant effects were concluded for the other nine sites.

F.3 Habitats Regulations Assessments

F.3.1 Habitats Regulations Assessment process

F.3.1.1 There is a requirement under the Conservation of Habitats and Species Regulations 2017 (as amended) ("the Habitats 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 an HRA.

F.3.1.2 The Habitats 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 historically were known as Natura 2000, and domestically now known as the National Site Network (NSN). 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 wetland sites of international importance (Ramsar Sites) also treated equally within this assessment framework. These sites are collectively referred to in this document as 'Habitats Sites.'

F.3.1.3 Regulations 63 and 64 transposed the provisions of Articles 6(3) and 6(4) of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') as they related to plans or projects in England and Wales.

F.3.1.4 Regulation 63 states that if a plan or project is *'(a) is likely to have a significant effect on a European site*[1] *or a European offshore marine site (either alone or in combination with other plans or projects); and (b) is not directly connected with or necessary to the management of the site*' then the competent authority must *'… make an appropriate assessment of the implications for the site in view of that site's conservation objectives'* before giving consent or authorisation. The plan or project can only be given effect if it can be concluded (following an 'appropriate assessment') that it *'… will not adversely affect the integrity'* of a site unless the provisions of Regulation 64 are met.

F.3.1.5 The process of undertaking this assessment is known as an HRA. An HRA determines whether a plan or project will result in LSE on any Habitats Site as a result of the plan's implementation (either on its own or 'in combination' with other plans or projects)[2] and, if so, an Appropriate Assessment ('AA') is undertaken to determine whether there will be any 'adverse effects on site integrity'[3]. If there may be such adverse effects on site integrity, then there will need to be a further process under Regulation 64 of considering whether there are alternatives and, if none

[1] The Habitats Regulations include measures to establish and maintain a network of sites protecting habitats which are valuable in themselves as well as for the species they support. These sites form a network of European sites in the Natura 2000 network, which domestically form part of the UK's National Site Network (NSN). The term 'European site' is currently retained in the EU Exit amendment to the Habitats Regulations and for all practical purposes the definition is essentially unchanged. European sites are therefore: any Special Area of Conservation (SAC) from the point at which the European Commission and the UK Government agreed the site as a 'Site of Community Importance' (SCI) (if this was before 31 Jan 2020); any classified Special Protection Area (SPA); and any candidate SAC (cSAC). However, the term is also commonly used when referring to potential SPAs (pSPAs), to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') are applied; and to possible SACs (pSACs) and listed Ramsar Sites, to which the provisions of the Habitats Regulations are applied as a matter of Government policy (National Planning Policy Framework (NPPF) para. 181) when considering development proposals that may affect them. In this document the term 'Habitats Sites' is used as an umbrella term for all the above designated and listed sites, after the NPPF.

[2] The Stage 1 Screening assessment, sometimes known as the 'Test of Likely Significance'

[3] The Stage 2 Appropriate Assessment, sometimes known as the 'Integrity Test'

are identified, assessment of compensation measures and whether there are imperative reasons of overriding public interest why consent should be granted or a plan published/approved notwithstanding. The Regulations define the nature and roles of statutory bodies, competent authorities and the appropriate nature conservation body as well as the requirements for information to be submitted to these bodies to enable them to undertake the required assessments.

F.3.1.6 An important relevant guidance document for HRAs in WRMPs is UKWIR (2021)[4]. Other relevant guidance such as The Habitats Regulations Assessment Handbook[5], existing EU guidance[6] and preceding domestic and European case law remains valid as a source of direction and interpretation of the requirements of the legislation[7].

F.3.2 Application of HRA in WRMPs

F.3.2.1 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 (NLSE) on any features of a Habitats Site, there is no requirement to undertake further stages. Similarly, if the Stage 2 AA concludes there will be no adverse effect on Site integrity (AESI) of the Habitats Site, then the assessment is concluded at this stage. The HRA stages are summarised within Table 3.1. Stage 3 (Assessment of Alternative Solutions) and Stage 4 (Assessment where no alternative solutions exist and where adverse effects remain) were not required for this WRMP.

Table 3.1: HRA stages

Stage	Description
Screening (Stage One) Or 'Test of Likely Significance'	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 Two 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

[4] UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans. UK Water Industry Research Limited, London.

[5] Tyldesley, D. & Chapman, C. (2021). The Habitats Regulations Assessment Handbook [online]. DTA Publications Limited. Available at: https://www.dtapublications.co.uk/handbook/

[6] European Commission (2018). Managing Natura 2000 Sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/CEE [online] available at: EN_art_6_guide_jun_2019.pdf (europa.eu) (last accessed April 2022).

[7] Other relevant guidance and case-practices include:

- UK Government (2019). Appropriate assessment: Guidance on the use of Habitats Regulations Assessment [online]. Available at: https://www.gov.uk/guidance/appropriate-assessment
- Tyldesley, D. & Chapman, C. (2021). The Habitats Regulations Assessment Handbook [online]. DTA Publications Limited. Available at: https://www.dtapublications.co.uk/handbook/
- Regulators' Alliance for Progressing Infrastructure Development (2022). Strategic regional water resource solutions guidance for Gate 2
- Landelijke Vereniging tot Behoud van de Waddenzeecase/ Nederlandse Vereniging tot Bescherming van Vogels, European Court of Justice, Case C-127/02 'Waddenzee 2002'.
- Sweetman et al. v An Bord Pleanála, European Court of Justice, Case C-258/11 'Sweetman 2011'
- People over Wind/Sweetman v Coiltte Teorante, European Court of Justice Case C-323/17 'People over Wind 2017'

Stage	Description
	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 Two) Or the 'Integrity Test'	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 Sites is likely to be adversely affected by the plan/project.
Assessment of Alternative Solutions (Stage Three)	If the mitigation measures applied and assessed during Appropriate Assessment cannot avoid adverse effects on the integrity of a Habitats Site, this stage examines alternative ways of achieving the objectives of the project or plan that avoid adverse effects on the integrity of the Habitats Site.
Assessment where no alternative solutions exist and where adverse effects remain (Stage Four)	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. 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.

Source: Mott MacDonald, 2022

F.3.2.2 The HRA for the NW WRMP24 has been undertaken in an iterative and objective manner following the above stages. It has been undertaken with reference to best practice guidance and relevant case law to inform the interpretation and therefore correct application of the terms 'likelihood, 'significance' and 'in-combination'.

F.3.2.3 Mott MacDonald undertook this HRA following the methodology in the Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15)[8].

F.3.3 HRA Stage 1 Screening assessment methodology

F.3.3.1 The initial list of sites for the HRA screening was derived by adopting a pathway/receptor approach with a distance-based threshold of 10km, whilst including more distant sites subject to longer pathways; these included those sites which were hydrologically connected via surface or groundwater catchments. This is based on the premise that most significant effects on qualifying features of Habitats Sites will occur within a maximum of a 10km radius[9]. This distance of 10km is defined as the Zone of Influence (ZoI) of the NW Options, which has been extended where appropriate to capture all potential effects on Habitats Sites.

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

[9] UKWIR (2021). Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15), 132p.

F.3.3.2 In conducting 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 Site, including any marine elements of these sites within the potential 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 and are not confined to activities on or adjacent to the site.
- Any viable pathways for the project (or plan) to the receptor (Habitats Sites themselves or functionally linked land).
- The features of interest of the Habitats Site(s) in question.
- 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.

F.3.3.3 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. 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 and/or abundance 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 potential for them being undertaken within a reasonable time period, specified within that plan.

F.3.3.4 In line with relevant case law, this assessment is undertaken in the absence of mitigation (including measures embedded into the Options where these are intended for the avoidance of effects). Where LSE were identified the assessment has taken these effects through to Stage 2 AA. Drawing on other relevant case law, the phrase ‘likely significant’ should be interpreted as ‘a credible risk that the conservation objectives will be undermined’.

F.3.4 Appropriate Assessment approach and methodology

Approach

F.3.4.1 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 on the integrity of that site in view of that site's structure, function and conservation objectives and considering any site-specific supplementary advice or site improvement plan.

F.3.4.2 Where mitigation measures are to be applied to eliminate or reduce any effects identified in screening, these may be considered within the AA.

F.3.4.3 Potential effects 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 Site(s)). 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.

F.3.4.4 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.

F.3.4.5 This HRA Stage 2 AA has been formulated using the following approach:

- Review the sites identified at Stage 1 and confirm any additions or exclusions
- Assessment of the construction and operation effects of the selected Options
- Assessment of the Habitats Sites' qualifying features and identification of their conservation objectives[10]
- Identification of the aspects of the proposed Options that will significantly impact the conservation objectives of the Habitats Site(s)[11]

F.3.4.6 This assessment has been undertaken having regard to the following guidance:

- GOV.UK (2019) Appropriate Assessment - Guidance on the use of Habitats Regulations Assessment. Published 22 July 20193
- UK Water Industry Research (UKWIR, 2021)[12]
- European Commission (EU, 2018) Managing Natura 2000 sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC[13]

Consultation

F.3.4.7 It is recommended that NW work closely with Natural England and the Habitats Site managers to agree the specific mitigation measures to be included in the HRA. The agreed mitigation measures will be expected to form part of planning conditions, development consent orders and/or conditions of relevant environmental permits, and their implementation managed through contractual obligations with supervision from an Environmental Clerk of Works.

Potential effects considered as part of the HRA

F.3.4.8 Following UKWIR (2021) guidance and given the nature of the 'No Regret' Options[14],the potential effects considered in this assessment are summarised in Table 3.2. Proposed distances are also provided following the same guidance to ascertain if, where a pathway has

[10] Habitats Site descriptions, qualifying features and conservation objectives are given in Appendix A.

[11] This is the Appropriate Assessment given and tabulated in Sections 4, 5 and 7.

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

[13] European Commission (2018). Managing Natura 2000 Sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/CEE [online] available at: EN_art_6_guide_jun_2019.pdf (europa.eu) (last accessed April 2022).

[14] Options first which address water demand risks which are present in the considered scenarios.

been identified, the impact is likely to 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 activities resulting in effects and proposed ZoI
Physical loss Destruction (including offsite effects) e.g., foraging habitat, smothering	Development of built infrastructure associated with the Options, e.g., reservoir embankments and access routes[15]. Physical loss may 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 Option effects the linking habitat).
Physical damage Habitat degradation Erosion Trampling Fragmentation Severance/barrier effects Edge effects	Development of built infrastructure associated with the Options, e.g., reservoir embankments and access routes. Physical loss may 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 Option 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 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 Option** Noise from construction traffic is only likely to be significant where the transport route to and from the Option 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 Option 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 Option is within **500m** of the boundary of the Habitats Site.

[15] 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 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 activities resulting in effects and proposed ZoI
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 Option extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the Option and the Habitats Site and whether the Option 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 Option extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the Option and the Habitats Site, and sometimes whether the Option is up or downstream from that site. Air emissions associated with plant and vehicular traffic during construction and operation of the Option. 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 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 Option 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 Option extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the Option and the Habitats Site, and sometimes whether the Option 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 activities 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 Option 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 Option extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the Option and the Habitats Site, and sometimes whether the Option 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 Option is situated within the Habitats Site or an upstream tributary of the Habitats Site, but also for inter-catchment water transfers.

Source: UK Water Industry Research (2021)[12]

Key Assumptions and standard best-practice mitigation measures

Overview

F.3.4.9 The high-level nature of this assessment undertaken at the plan stage reflects that there is some lack of detailed design for the WRMP24 Options. By law, any plan being taken forward to be implemented will be subject to an AA at the project stage, when, in the light of more information relating to the construction and design of the Option, a more refined HRA assessment can be undertaken. However, it is considered that this AA has been undertaken in a robust manner and to the fullest extent possible at this stage of the plan.

Standard best practice measures during construction

F.3.4.10 Based on the current level of detail available for the WRMP24, a number of established mitigation measures are given which can be assumed for all Options. 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. These measures will be applied to the construction of the final Option and constitute mitigation to avoid or reduce adverse effects on Habitats Site integrity and therefore are only mentioned at the AA stage.

F.3.4.11 The following measures constitute best practice for the WRMP24 Option:

Options design

- Should design be altered, every opportunity for avoiding potential effects on Habitats Sites (e.g., through alternative pipeline routes and micro siting) should be taken.
- Construction of new pipelines at watercourse crossings will be designed to avoid direct impacts on riverbed and permanent habitat loss. If project-level hydrological investigations imply that there will be disruption to the water table, it will be recommended that a directional drilling method is employed to ensure that no direct impact on the water course or adjoining Habitats Site(s) occurs. Directional drilling will be used at all watercourses >3m wide- for

water courses <3m wide, localised, and temporary water quality and hydrology changes may arise during construction, but as pollution control best practices will be applied to all water course crossings at all times, these measures are considered sufficient to mitigate for any significant effect related to water pollution. The potential for increased flood risk and groundwater impacts will be confirmed in the hydrological investigations which will inform the HRA at this stage.

- Pipeline routes will be preferably designed to avoid unnecessary watercourses crossings and as distant as possible to Habitats Sites boundaries to offer a buffer limiting pathways through disturbance and pollution runoff. The buffers applied to access potential effects will be specific to each Option and will consider the Habitats Sites and their qualifying features.

Pollution control

- Indirect construction-related pollution is identified as one key pathway through which Habitats 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 Habitats 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)[16];
  - CIRIA C532 Control of water pollution from construction sites (Masters-Williams et al. 2001)[17]; and
  - Environment Agency's Pollution Prevention Guidance Notes[18] 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).
- 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.

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

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

[18] 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).

  - 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 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. Specific limits for different species will be added on a case-by-case situation.
- Construction related noise disturbance will be minimised by implementing best practice such as BS 5228-1:2009+A1:2014 (The British Standards Institute, 2008)[19].

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 Professionals, 2011)[20].

Construction Environmental Management Plan (CEMP)

F.3.4.12 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 the industry best practice measures listed above and any targeted mitigation measures identified during the formal HRA.

Standard best-practice during operation

F.3.4.13 There are no assumptions relating to best practice or otherwise during the operation of the final Option. This will be tailored to each Option as needed.

[19] 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.

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

F.4 Supplying Teesside Industrial Water Option

F.4.1 Option description

F.4.1.1 The 'Supplying Tees Industrial Water' Option involves increasing the Blackwell abstraction licence back to pre- 2016 volumes (58,075 Ml/yr, 159 Ml/d), along with installing Eel Regs compliant eel screens at the Low Worsall intake and increasing the Low Worsall abstraction licence to 170Ml/d, with an annual limit of 62,000Ml (170*365days). The Option will be operational by 2027/2028.

F.4.1.2 The two new intake proposed locations are:

- Blackwell intake – River Tees from River Greta to River Skerne waterbody (GB103025072190).
- Low Worsall intake – River Tees from Skerne to Tidal Limit waterbody (GB103025072595).

F.4.2 Stage 1 Screening – Review

F.4.2.1 The Habitat Regulations Assessment (HRA) Stage 1 screening Test of Likely Significance (ToLS) carried out in March 2024 identified two Habitats Sites within the Zone of Influence (ZoI) of this Option, both of which were assessed with potential for Likely Significant Effects (LSE) (Table 4.1).

F.4.2.2 This option has proceeded to the next HRA stage – AA. The full HRA Screening review is presented in Appendix A. Information on the Habitats Sites is provided in Appendix B, including qualifying features, conservation objectives, and threats and pressures to site integrity.

Table 4.1: Stage 1 screening results

Potential for Significant Effects	No Likely Significant Effects
Teesmouth and Cleveland Coast SPA (UK9006061) (multiple site units; closest approximately 18.78km)	None
Teesmouth and Cleveland Coast Ramsar Site (UK11068) (multiple site units; closest approximately 26.38km)	

F.4.2.3 This Option has proceeded to the next HRA stage – AA. The full HRA Screening review is presented in Appendix A. Information on the Habitats Sites is provided in Appendix B, including qualifying features, conservation objectives, and threats and pressures to site integrity.

F.4.3 Stage 2 Appropriate Assessment

F.4.3.1 The Stage 2 AA provides an assessment to determine whether the construction and/or operation of this Option will result in an adverse effect on the site integrity of the Habitats Sites identified at the screening stage with potential for LSE. At this stage, mitigation measures to prevent adverse effects can be included. For the purpose of these assessments, the use of widely used best practice measures constitute mitigation and are therefore included within Section 3.4.

The AA will result in one of three potential outcomes:

- Evidence is sufficient and demonstrates there will be no adverse effects
- Evidence is sufficient but indicates that there will be an adverse effect
- Insufficient evidence to determine the effects.

Scope

F.4.3.2 The following Habitats Sites were assessed at Stage 2 AA:

- Teesmouth and Cleveland Coast SPA (UK9006061)
- Teesmouth and Cleveland Coast Ramsar Site (UK11068)

F.4.4 Potential Effects on Habitats Sites

F.4.4.1 The potential effects of the construction and operation phases for the New Supplying Teesside Industrial Water Option are described below, considering the type, size, and scale of the element.

F.4.4.2 An assessment of each potential effect on the integrity of the Habitats Sites is made, in view of the sites' structure, function and conservation objectives. Where adverse effects are deemed significant, mitigation measures are also proposed in the following section.

F.4.4.3 At this stage, based on current information and in the absence of ecological assessment, a worst-case scenario is assumed. The potential adverse effects and recommended mitigation measures are outlined in Table 4.2.

Teesmouth and Cleveland Coast SPA (UK9006061) (multiple site units; closest approximately 18.78km)

F.4.4.4 Teesmouth and Cleveland Coast SPA is located along the Tees estuary in the north-east of England. It comprises a variety of complex habitats including sandflats, mudflats, rocky foreshore, saltmarsh, sand dunes, wet grassland and freshwater lagoons. The SPA is designated for its numbers of European importance of breeding little tern (*Sternula albifrons*), passage sandwich tern (*Thalasseus sandvicensis*), wintering red knot (*Calidris canutus*) and passage common redshank (*Tringa totanus*) as well as an assemblage of over 20,000 waterbirds. The SPA was extended in 2001 to include an internationally important population of passage Ringed plover and again in January 2020 to add breeding avocet (*Recurvirostra avosetta*), breeding common tern (*Sterna hirundo*) and non-breeding ruff (*Calidris pugnax*) as protected features. The extension also includes additional areas of coastal and wetland habitats, the River Tees channel and the shallow coastal waters of Tees Bay. The SPA is a complex of discrete sites, with additional non-designated areas also used for foraging and roosting. The area is subject to several pressures, most notably significant modified by human activities, with over 90% of intertidal habitats lost to land claim.

Construction effects

F.4.4.5 This Habitats Site is located approximately 39km downstream from the Blackwell abstraction location and approximately18km downstream from the Low Worsall abstraction site. This is considered to be sufficiently distant that it is unlikely that any activities associated with the construction phase will result in adverse effects on the integrity of this Habitats Site and/or its qualifying features.

Operation effects

F.4.4.6 The Option proposes to reinstate the 2016 abstraction licence levels (150Ml/d peak, 85Ml/d annual average) from the River Tees which feeds directly into this Habitats Site. The proposed intake locations at Tees from River Greta to River Skerne waterbody (GB103025072190) and Tees from Skerne to Tidal Limit waterbody (GB103025072595) are hydrologically connected to the Teesmouth and Cleveland Coast SPA via de River Tee. Therefore, there is a pathway for adverse effects during the operation phase as a result of the increase in water abstraction.

F.4.4.7 The Level 2 WFD assessment (Appendix G – Water Framework Directive Report) identified potential adverse impacts to both waterbodies and the Tees transitional waterbody

(GB510302509900) including impacts to biological quality elements (fish, invertebrates and macrophytes and phytobenthos), hydromorphological supporting elements and physicochemical quality elements (ammonia, dissolved oxygen, pH and phosphate). These impacts have the potential to result in adverse effects on the integrity of the Teesmouth and Cleveland Coast SPA located downstream of the abstractions.

F.4.4.8 Adverse effects during the operation of this Option cannot be excluded at this stage. The justification for this is outlined below:

- Water table/ availability – changes to surface water levels and flows and changes to groundwater due to increased abstraction associated with the Option may result in habitat loss and degradation downstream of the abstraction.
- Physical damage – habitat degradation including changes in water quality; chemistry, salinity, temperature due to the new abstraction in the River Tees. Increased abstraction has the potential to affect the supply and distribution of fine sediments to the Tees estuary. This may affect the benthic fauna (invertebrate communities), which is the principal food supply of qualifying bird species.
- Toxic contamination – an increase in abstraction can lead to nutrients and pollutants in the water potentially becoming more concentrated due to the lack of dilution.
- Non-toxic contamination – changes in turbidity; sedimentation and silt deposition have the potential to affect coastal processes and ecosystem dynamics, potentially leading to changes in natural succession and a reduction of invertebrate prey important for a range of overwintering qualifying waterbirds.
- Biological disturbances – changes to habitat availability (including functionally linked habitat/supporting habitat); changes in species abundance or distribution; reduced food availability for key wader species and potential for bird species to be displaced from current feeding sites. A change to sediment inputs due to abstraction can also contribute to the spread of algal mats that can restrict waterbird access to benthic invertebrates.

F.4.4.9 The identified effects have the potential to reduce the extent and distribution of functional habitat which supports the qualifying species' populations.

F.4.4.10 Further hydrological modelling to inform the assessment is required to ensure flow requirements downstream of abstraction location are still met under scheme so that it does not result in adverse effects on the integrity of this Habitats Site and its qualifying features.

Teesmouth and Cleveland Coast Ramsar Site (UK11068) (multiple site units; closest approximately 26.38km)

F.4.4.11 Teesmouth and Cleveland Coast Ramsar Site encompasses a range of complex habitats (sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) supporting internationally important numbers of waterbirds. The Ramsar Site has been designated under Ramsar Criterion 5 for supporting waterfowl assemblages of international importance and under Criterion 6 for supporting spring/autumn populations of Common redshank (*Tringa totanus totanus*) and wintering Red knot (*Calidris canutus islandica*) populations occurring at levels of international importance. The site also supports a rich assemblage of invertebrates, including the following seven Red Data Book species: the marsh fly *Pherbellia grisescens,* dark northern stiletto *(Thereva valida),* bladderwort flea beetle *(Longitarsus nigerrimus),* long-toed water beetle *(Dryops nitidulus*), aquatic leaf beetle *(Macroplea mutica),* the rove beetle *Philonthus dimidiatipennis* and the beetle *Trichohydnobius suturalis*.

Construction effects

F.4.4.12 The construction effects for this Habitats Site are expected to be similar to the ones listed above for Teesmouth and Cleveland Coast SPA (Section 4.4.1.1 – Construction effects).

Operation effects

F.4.4.13 The operation effects for this Habitats Site are expected to be similar to the ones listed above for Teesmouth and Cleveland Coast SPA (Section 4.4.1.1 – Operation effects).

F.4.5 Assumptions and Mitigation Measures

F.4.5.1 In accordance with the National Planning Policy Framework (NPPF) 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.

F.4.5.2 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 adverse effects on site integrity.

F.4.5.3 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.

Table 4.2: Supplying Teesside Industrial Water Option - Potential effects on designated qualifying features

Habitat Sites	Qualifying features	Possible adverse effects before mitigation	Proposed Mitigation measures	Possible adverse effects after mitigation
Teesmouth and Cleveland Coast SPA (UK9006061) (multiple site units; closest approximately 18.78km)	A132 *Recurvirostra avosetta*; Pied avocet (Breeding) A143 *Calidris canutus*; Red knot (Non-breeding) A151 *Calidris pugnax*; Ruff (Non-breeding) A162 *Tringa totanus*; Common redshank (Non-breeding) A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding) A193 *Sterna hirundo*; Common tern (Breeding) A195 *Sterna albifrons*; Little tern (Breeding) Waterbird assemblage	This SPA is sufficiently distant from the proposed intake locations at Blackwell (>39 km) and Low Worsall (>18km) that it is unlikely that any activities during the construction phase may result in adverse effects on this Habitats Site and its qualifying features. The proposed intake locations are hydrologically connected to the SPA via de River Tee. Therefore, there is a pathway for adverse effects during the operation phase as a result of the increase in water abstraction that cannot be ruled out at this stage. **During operation, this Option is likely to result in:** ● Water table/ availability – changes to surface water levels and flows; changes to groundwater due to increased abstraction associated with the Option. ● Physical damage – habitat degradation; changes in water quality; chemistry, salinity, temperature due to the new abstraction in the River Tee. Increased abstraction has the potential to affect the supply and distribution of fine sediments to the Tees estuary. This may affect the benthic fauna (invertebrate communities), which is the principal food supply of qualifying non-breeding waterbirds. ● Toxic contamination – an increase in abstraction can lead to nutrients and pollutants in the water potentially becoming more concentrated due to the lack of dilution. ● Non-toxic contamination – changes in turbidity; sedimentation and silt deposition have the potential to affect coastal processes and	Mitigation measures during operation include: ● An environmental flows assessment will be undertaken to understand if the existing abstraction may result in adverse effects. If this is the case environmental flows rules will be stipulated to avoid adverse effects. ● A plan for improving existing habitats downstream of the abstraction as well as increasing habitat suitability in the Teesmouth (proposing new habitats along the coast and enhancing its connection to the shore) should be taken into consideration. This new/enhanced habitat would not only function as a fish refuge, but also as a support for this site's qualifying bird species.	Assuming all proposed mitigation is implemented it is considered that there will be no adverse effects on the integrity of the site during the construction phase that could affect: ● The extent and distribution of qualifying birds; ● The structure and function of the habitats of qualifying species; and ● The supporting processes on which habitats of qualifying species rely. Adverse effects during the operation phase cannot be excluded at this stage. Further assessment is required to ensure flow requirements downstream of abstraction location are still met under scheme so that it does not result in adverse effects on the integrity of this Habitats Site and its qualifying features.

Habitat Sites	Qualifying features	Possible adverse effects before mitigation	Proposed Mitigation measures	Possible adverse effects after mitigation
		ecosystem dynamics, potentially leading to changes in natural succession and a reduction of invertebrate prey important for a range of overwintering qualifying waterbirds. ● Biological disturbances – changes to habitat availability (including functionally linked habitat/supporting habitat); changes in species abundance or distribution; reduced food availability for key wader species and potential for bird species to be displaced from current feeding sites. A change to sediment inputs due to abstraction can also contribute to the spread of algal mats that can restrict waterbird access to benthic invertebrates. The identified effects have the potential to reduce the extent and distribution of functional habitat which supports the qualifying species' populations.		
Teesmouth and Cleveland Coast Ramsar Site (UK11068) (multiple site units; closest approximately 26.38km)	**Ramsar criterion 5** Assemblages of international importance: Species with peak counts in winter: 9528 waterfowl (5-year peak mean 1998/99-2002/2003)	See "Possible adverse effects before mitigation" listed above for Teesmouth and Cleveland Coast SPA	See "Proposed mitigation measures" listed above for qualifying features of the Teesmouth and Cleveland Coast SPA.	As above
	Ramsar criterion 6 – Species/populations occurring at levels of international importance. qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: *Common redshank*, *Tringa totanus totanus*, 883	See "Possible adverse effects before mitigation" listed above.	See "Proposed mitigation measures" listed above.	As above

Habitat Sites	Qualifying features	Possible adverse effects before mitigation	Proposed Mitigation measures	Possible adverse effects after mitigation
	individuals, representing an average of 0.7% of the GB population (5 year peak mean 1998/9-2002/3) Species with peak counts in winter: Red knot, *Calidris canutus islandica*, W & Southern Africa (wintering) 2579 individuals, representing an average of 0.9% of the GB population (5-year peak mean 1998/9-2002/3)			

F.4.6 Stage 2 outcomes

F.4.6.1 Following this HRA AA, it is considered that with adherence to the proposed mitigation, the proposed works associated with the Option during the construction phase are not expected to result in adverse effects on the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar Site that could affect:

- The extent and distribution of qualifying birds;
- The structure and function of the habitats of qualifying species; and
- The supporting processes on which habitats of qualifying species rely.

F.4.6.2 Adverse effects during the operation of this Option cannot be excluded at this stage. Further hydrological modelling to inform the assessment is required to ensure flow requirements downstream of abstraction location are still met under scheme so that it does not result in adverse effects on the integrity of these Habitats Site and their qualifying features during operation.

F.4.7 Conclusions

F.4.7.1 Having examined all the potential construction and operational effects in the light of the Habitats Sites' conservation objectives and at this stage (the plan making stage) taking a precautionary approach to assessment and assuming that all proposed mitigation measures are implemented it is considered that this Option would not result in adverse effects on the integrity of any Habitats Sites during the construction phase.

F.4.7.2 Adverse effects during the operation of this Option cannot be excluded at this stage. Further hydrological modelling to inform the assessment is required to ensure flow requirements downstream of abstraction location are still met under scheme so that it does not result in adverse effects on the integrity of these Habitats Site and their qualifying features.

F.4.8 Next Steps

- Option/design refinement so that more detailed design information is generated to enable a greater understanding of the operation phase.
- On a precautionary basis, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:
  - Detailed investigation into the effects of the proposed abstraction to fully understand changes water quality and flows and its extent.
  - A hydrogeological assessment will be required to assess environmental flows if abstraction is above current licence limits.

F.4.8.1 The Option is expected to be in operation from 2027/2028. There is, therefore, sufficient time for the studies to be completed before a detailed project design is brought forward for re-assessment under the Habitats Regulations at the project level to inform the EIA.

F.5 In Combination Effects

F.5.1 In Combination Assessment

F.5.1.1 This in combination assessment aims to identify where the NW WRMP24 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.

F.5.1.2 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.

F.5.1.3 GIS was used to identify any plans and strategic projects that interacted with receptors affected by the single supply side Option 'Supplying Teesside Industrial Water' included in the NW WRMP24.

F.5.1.4 Strategic plans and projects identified that may interact with the NW WRMP24 are:

- River Basin Management Plans (RBMPs)
- Marine plans
- NW Drought Plan
- NW 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

F.5.1.5 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.

F.5.1.6 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.

F.5.1.7 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.

F.6 Conclusions and recommendations

F.6.1.1 Following HRA AA and having examined all the potential effects in the light of the Habitats Sites' conservation objectives and at this stage (the plan making stage) taking a precautionary approach to assessment and assuming that all proposed mitigation measures are implemented it is considered that this Option would not result in adverse effects on the integrity of any Habitats Sites during the construction phase.

F.6.1.2 Adverse effects during the operation phase cannot be excluded at this stage. Further hydrological modelling to inform the assessment is required to ensure flow requirements downstream of abstraction location are still met under scheme so that it does not result in adverse effects on the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar Site.

F.6.1.3 The Option has been considered with regard to potential for in-combination effects. There is confidence that the measures detailed in this plan level assessment can avoid and/or mitigate for all potential effects and therefore, adverse in-combination effects are not anticipated.

F.6.1.4 On a precautionary basis, further studies are recommended to propose more targeted mitigation measures and fulfil the regulatory requirements applicable at the project level, including:

- Detailed investigation into the effects of the proposed abstraction to fully understand changes water quality and flows and its extent.
- A hydrogeological assessment will be required to assess environmental flows if abstraction is above current licence limits.

F.6.1.5 The Option is expected to be in operation from 2027/2028. There is, therefore, sufficient time for the studies to be completed before a detailed project design is brought forward for re-assessment under the Habitats Regulations at the project level to inform the EIA.

F.6.1.6 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.

F.7 References

Booy, O., Wade, M. and White, V. (2008). Invasive species management for infrastructure managers and the construction industry. CIRIA C679, 39p.

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

Environment Agency (2007). Pollution Prevention Guidelines: Works and maintenance in or near water: PPG5, 16p. pmho1107bnkg-e-e.pdf (nationalarchives.gov.uk).

Environment Agency (2009). Pollution Prevention Guidelines: Incident Response Planning: PPG21, 20p. [ARCHIVED CONTENT] (nationalarchives.gov.uk).

Environment Agency (2010). Pollution Prevention Guidelines: Working at Construction and Demolition Sites: PPG6, 78p. pmho0412bwfe-e-e.pdf (nationalarchives.gov.uk).

Environment Agency (2011). Pollution prevention Guidelines: Incident Response Dealing with Spills: PPG22, 31p. Title (nationalarchives.gov.uk).

Environment Agency (2013). Pollution Prevention Guidelines: PPG1. Understanding Your Environmental Responsibilities – Good Environmental Practices, 10p. Title (nationalarchives.gov.uk).

Environment Agency, Natural Resources Wales, Office for Water Services (2022). Water resources planning guideline. Available at: Water resources planning guideline - GOV.UK (www.gov.uk).

European Commission (2018). Managing Natura 2000 Sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/CEE [online] available at: EN_art_6_guide_jun_2019.pdf (europa.eu) (last accessed April 2022).

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

Landelijke Vereniging tot Behoud van de Waddenzeecase/ Nederlandse Vereniging tot Bescherming van Vogels, European Court of Justice, Case C-127/02 'Waddenzee 2002' Arrêt de la Cour (europa.eu).

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

People over Wind/Sweetman v Coiltte Teorante, European Court of Justice Case C-323/17 'People over Wind 2017' UKWIR (2021). Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15), 287p.

People over Wind/Sweetman v Coiltte Teorante, European Court of Justice Case C-323/17 'People over Wind 2017' People over Wind and Peter Sweetman v Coillte | Jun - 2018 | A&L Goodbody (algoodbody.com).

Sweetman et al v An Bord Pleanala, European Court of Justice, Case C-258/11 'Sweetman 2011' EUR-Lex - 62011CJ0258 - EN - EUR-Lex (europa.eu).

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.

The European Parliament and the Council of the European Union (2001). Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment. Official Journal of the European Communities. Available at: EUR-Lex - 32001L0042 - EN - EUR-Lex (europa.eu).

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).

UK Water Industry Research (2021). Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15), 287p.

UKWIR (2021). Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (21/WR/02/15), 132p. Habitats Sites descriptions, qualifying features and conservation objectives are given in Appendix B.

A. Appendix A – Screening Results

Table 7.1: Supplying Teesside Industrial Water Option Stage 1 - Screening results

Habitats Sites	**Teesmouth and Cleveland Coast SPA (UK9006061) (multiple site units; closest approximately 18.78km)**	**Teesmouth and Cleveland Coast Ramsar Site (UK11068) (multiple site units; closest approximately 26.38km)**
Qualifying Features	A132 *Recurvirostra avosetta*; Pied avocet (Breeding) A143 *Calidris canutus*; Red knot (Non-breeding) A151 *Calidris pugnax*; Ruff (Non-breeding) A162 *Tringa totanus*; Common redshank (Non-breeding) A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding) A193 *Sterna hirundo*; Common tern (Breeding) A195 *Sterna albifrons;* Little tern (Breeding) Waterbird assemblage	**Ramsar criterion 5** Assemblages of international importance: Species with peak counts in winter: 9528 waterfowl (5 year peak mean 1998/99-2002/2003) **Ramsar criterion 6** – species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: Common redshank , *Tringa totanus totanus*, 883 individuals, representing an average of 0.7% of the GB population (5 year peak mean 1998/9-2002/3) Species with peak counts in winter: Red knot , *Calidris canutus islandica*, W & Southern Africa (wintering) 2579 individuals, representing an average of 0.9% of the GB population (5 year peak mean 1998/9-2002/3)
Screening Result	Likely significant effects	Likely significant effects
Justification for Assessment	This Option involves bringing the existing but currently unused Low Worsall RWPS on the Tees back into use, installing Eel Regs compliant eel screens at Low Worsall RPWS and increasing abstraction licences at Low Worsall RWPS back up to 2016 levels and at Blackwell RWPS back up to historic (pre-2016) levels. Teesmouth and Cleveland Coast SPA is a 1,200 ha complex of coastal habitats centred on the Tees estuary. These include sandflats, mudflats, rocky foreshore, saltmarsh, sand dunes, wet grassland and freshwater lagoons. The SPA has been designated for its numbers of European importance of breeding little tern, passage Sandwich tern, wintering red knot and passage common redshank as well as an assemblage of over 20,000 waterbirds. The SPA was extended again in January 2020 to add breeding avocet, breeding common tern and non-breeding ruff as protected features. The extension also includes additional areas of coastal and wetland habitats, the River Tees channel and the shallow coastal waters of Tees Bay. The area has been highly modified by human activities, with over 90% of	This Option involves bringing the existing but currently unused Low Worsall RWPS on the Tees back into use, installing Eel Regs compliant eel screens at Low Worsall RPWS and increasing abstraction licences at Low Worsall RWPS back up to 2016 levels and at Blackwell RWPS back up to historic (pre-2016) levels. Teesmouth and Cleveland Coast Ramsar Site encompasses a range of habitats (sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes) supporting internationally important numbers of waterbirds. This Ramsar Site is sufficiently distant from the proposed intake locations at Blackwell (>46km) and Low Worsall (>26km) that it is unlikely that any activities during the construction phase may result in likely significant effects on this Habitats site and its qualifying features. The proposed intake locations are hydrologically connected to the Ramsar Site via

	intertidal habitats lost to land claim. This SPA is sufficiently distant from the proposed intake locations at Blackwell (>39 km) and Low Worsall (>18km) that it is unlikely that any activities during the construction phase may result in likely significant effects on this Habitats Site and its qualifying features. The proposed intake locations are hydrologically connected to the SPA via de River Tee. Therefore, there is a pathway for likely significant effects during the operation phase as a result of the increase in water abstraction. **During operation, this Option is likely to result in:** • Water table/ availability – changes to surface water levels and flows; changes to groundwater due to increased abstraction associated with the Option. • Physical damage – habitat degradation; changes in water quality; chemistry, salinity, temperature due to the new abstraction in the River Tee. Increased abstraction has the potential to affect the supply and distribution of fine sediments to the Tees estuary. This may affect the benthic fauna (invertebrate communities), which is the principal food supply of qualifying non-breeding waterbirds. • Toxic contamination – an increase in abstraction can lead to nutrients and pollutants in the water potentially becoming more concentrated due to the lack of dilution. • Non-toxic contamination – changes in turbidity; sedimentation and silt deposition have the potential to affect coastal processes and ecosystem dynamics, potentially leading to changes in natural succession and a reduction of invertebrate prey important for a range of overwintering qualifying waterbirds. • Biological disturbances – changes to habitat availability (including functionally linked habitat/supporting habitat); changes in species abundance or distribution; reduced food availability for key wader species and potential for bird species to be displaced from current feeding sites. A change to sediment inputs due to abstraction can also contribute to the spread of algal mats that can restrict waterbird access to benthic invertebrates. The identified effects have the potential to reduce the extent and distribution of functional habitat which supports the qualifying species' populations. The Level 1 WFD assessment covered five water bodies of the Option. The outcome for three of these water bodies indicated further assessment would be necessary for the Option because of the increase in surface water abstractions.	the River Tee, therefore, there is a pathway for likely significant effects during the operation phase as a result of the increase in water abstraction. **During operation, this Option is likely to result in:** • Water table/ availability – changes to surface water levels and flows; changes to groundwater due to increased abstraction associated with the Option. • Physical damage – habitat degradation; changes in water quality; chemistry, salinity, temperature due to the new abstraction in the River Tee. Increased abstraction has the potential to affect the supply and distribution of fine sediments to the Tees estuary. This may affect the benthic fauna (invertebrate communities), which is the principal food supply of qualifying non-breeding waterbirds. • Toxic contamination – an increase in abstraction can lead to nutrients and pollutants in the water potentially becoming more concentrated because of the lack of dilution. • Non-toxic contamination – changes in turbidity; sedimentation and silt deposition have the potential to affect coastal processes and ecosystem dynamics, potentially leading to changes in natural succession and a reduction of invertebrate prey important for a range of overwintering qualifying waterbirds. • Biological disturbances – changes to habitat availability (including functionally linked habitat/supporting habitat); changes in species abundance or distribution; reduced food availability for key wader species and potential for bird species to be displaced from current feeding sites. A change to sediment inputs due to abstraction can also contribute to the spread of algal mats that can restrict waterbird access to benthic invertebrates. The identified effects have the potential to reduce the extent and distribution of functional habitat which supports the qualifying species' populations. The Level 2 WFD assessment identified potential adverse impacts (impact score 2) to biological quality elements (invertebrates and macrophytes and phytobenthos), hydromorphological supporting elements (hydrological regime and mitigation measures assessment) and physicochemical quality elements (ammonia, dissolved oxygen, pH and phosphate). This is due to the proposed increase in licence of the surface water abstraction. Therefore, further assessment is required to ensure identified flow requirements downstream of abstraction location are still met under scheme so that it does not result in adverse effects on the integrity of the SPA/Ramsar Site and its qualifying features. The Level 1 WFD assessment covered five water bodies of the Option. The outcome for three of these water bodies indicated further assessment would be necessary for the Option because of the increase in surface water abstractions.

B. Appendix B – Habitats Sites

Teesmouth and Cleveland Coast SPA (UK9006061)

Site Description

F.7.1.1 Teesmouth and Cleveland Coast SPA is a 1,200 ha complex of coastal habitats centred on the Tees estuary. These include sandflats, mudflats, rocky foreshore, saltmarsh, sand dunes, wet grassland and freshwater lagoons. Together they support internationally important populations of breeding and non-breeding waterbirds. The SPA is classified for its breeding Little tern, passage Sandwich tern, wintering Knot and Redshank and an assemblage of over 20,000 wintering waterbirds. In addition, the 2001 SPA review identified an internationally important population of passage Ringed plover. The SPA is a complex of discrete sites, with additional non-designated areas also used for foraging and roosting. The area has been highly modified by human activities, with over 90% of intertidal habitats lost to land claim, which continued into the 1970s.

Qualifying Features

- A132 *Recurvirostra avosetta*; Pied avocet (Breeding)
- A143 *Calidris canutus*; Red knot (Non-breeding)
- A151 *Calidris pugnax*; Ruff (Non-breeding)
- A162 *Tringa totanus*; Common redshank (Non-breeding)
- A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding)
- A193 *Sterna hirundo*; Common tern (Breeding)
- A195 *Sterna albifrons*; Little tern (Breeding)
- Waterbird assemblage

Conservation Objectives

F.7.1.2 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.

Pressures and Treats

- **Physical modification**: The estuary has been heavily modified, primarily by land claim. This has significantly reduced the area of intertidal, which is the supporting habitat for a large number of non-breeding waterbirds. In addition, the changed morphology has altered the hydrodynamics of the estuary. This affects the supply and distribution of sediments in the remaining intertidal areas. For example, the Tees Barrage regulates river flow and consequently the supply of riverine sediments, while retaining walls constrain the movement of sediment around the estuary. These changes are likely to have affected the benthic fauna, which is the principal food supply of a number of non-breeding waterbirds. They have

potentially also contributed to the spread of algal mats by providing suitable conditions for algal growth (see also 'Water Pollution' section). Algal mats restrict waterbird access to benthic invertebrates and are also likely to have direct impacts on its biomass and species composition.

- **Public Access/Disturbance**: Both breeding Little tern and non-breeding waterbirds are disturbed by recreational beach users. These include walkers, dog walkers and kite surfers. There may be a shortage of safe roost sites on Teesside. Some former Little tern breeding sites may have been abandoned due to disturbance.
- **Direct land take from development**: Undesignated land that supports SPA birds ('functional habitat') has been negatively affected by development in the recent past. There are also new development proposals which may impact on other areas of functional habitat. To compound these impacts there is very little space for mitigation because most areas are already developed or designated.
- **Water Pollution**: Improvements to wastewater treatment and catchment management and the closure and re-location of wastewater discharges have significantly reduced the inputs of nutrients and organic matter to the Tees. These improvements in water quality have reduced the biomass of the benthic fauna that the estuary supports, and hence the food supply of a number of bird species. In addition, large areas of the estuary are covered by algae, predominantly Ulva. Algal mats restrict waterbird access to benthic invertebrates and are also likely to have direct impacts on its biomass and species composition. It is thought that high nutrient levels in the estuary from historic inputs have encouraged the growth of these mats. However, the improvements in water quality have yet to have significant impacts on the extent of algal mats. This may be because changes in estuary morphology are also responsible for the growth of algal mats (see 'Physical modification' section above) and/or nutrient levels need to be reduced further. Finally, the sediments of the Tees Estuary contain contaminants from historic pollution. These are generally buried under more recent less polluted sediments, but they may still be impacting the benthic fauna.
- **Fisheries – Commercial marine and estuarine:** Commercial fishing activities categorised as ‘amber or green’ under Defra’s revised approach to commercial fisheries in EMSs require assessment and (where appropriate) management. This assessment will be undertaken by NEIFCA. For activities categorised as ‘green’, these assessments will take account of any in combination effects of amber activities, and/or appropriate plans or projects, in the site. It is not known how much bait collection is commercial and how much is for recreation. See also 'Fisheries: Recreational marine and estuarine' section below.
- **Fisheries – Recreational marine and estuarine:** The estuary is heavily used by bait collectors, principally for crab trapping (summer and autumn) and ragworm and lugworm digging (all year, but especially in winter). This is likely to have a number of effects on non-breeding waterbirds. Bait collectors directly disturb non-breeding waterbirds. In addition, bait collection depletes the abundance of prey available for birds and could also change the size distribution and community composition of the benthic fauna. Crab traps could disrupt patterns of sediment distribution (it is likely that there are over 5,000 tyre/pipe 'traps' across the estuary). It is not known how much bait collection is commercial and how much is for recreation. See also 'Fisheries: Commercial marine and estuarine' section above.
- **Undergrazing:** Some of the undesignated land that is used by non-breeding waterbirds is being encroached by scrub and coarse vegetation. Consequently, these areas are becoming unsuitable for foraging or roosting. In addition, water levels on Cowpen Marsh have been increased to benefit breeding and foraging waterbirds, but these wetter conditions have made it difficult for livestock to access some sections of the site and additional infrastructure is required.
- **Inappropriate water levels:** The wetland habitats at RSPB Saltholme support a significant proportion of the non-breeding waterbirds that use the Tees estuary. However, these

habitats are sustained by a water supply derived from industrial sources. This may not be sustainable long term. Furthermore, the water supply is relatively saline which does not create optimum conditions for the waterbird assemblage. A sustainable long-term strategy for supplying sufficient water to dependent habitats is needed.

- **Coastal squeeze:** The River Tyne to Flamborough Head Shoreline Management Plan includes some sections of 'hold the line'. Coastal squeeze will reduce the area of intertidal and upper shore habitats, which are used for foraging and roosting by non-breeding waterbirds and for nesting by Little tern.
- **Change to site conditions:** sand dunes are accreting along sections of the coast. This may have resulted in some former Little tern breeding sites becoming unsuitable. See also the 'Air Pollution: impact of atmospheric nitrogen deposition' section below.
- **Air Pollution:** impact of atmospheric nitrogen deposition- Nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site. This requires further investigation. Nutrient enrichment is likely to encourage vigorous growth of vegetation in embryo dunes, which will reduce the area of suitable nesting habitat for Little tern. See also the 'Changes to site conditions' section above.

Teesmouth and Cleveland Coast Ramsar Site (UK11068)

Site Description

F.7.1.3 An estuarine complex of intertidal sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes. The site supports a rich assemblage of invertebrates, including the following seven Red Data Book species: the marsh fly *Pherbellia grisescens,* dark northern stiletto *(Thereva valida),* bladderwort flea beetle *(Longitarsus nigerrimus),* long-toed water beetle *(Dryops nitidulus*), aquatic leaf beetle *(Macroplea mutica),* the rove beetle *Philonthus dimidiatipennis* and the beetle *Trichohydnobius suturalis*. The estuary is also an important spring and/or autumn staging area for migratory waterbirds. During the five-year period 1987/88 to 1991/92, the following species occurred in nationally important numbers: Sandwich tern (*Sterna sandvicensis),* common redshank *(Tringa totanus),* common ringed plover *(Charadrius hiaticula)* and sanderling (*Caladris alba).* The site regularly supports over 20,000 waterbirds in winter. The five year peak mean for the period 1987/88 to 1991/92 was 20,799 birds, comprising 14,982 waders and 5,817 wildfowl. These included internationally important numbers of red knot (*Calidris canutus)* (3,574). The site also supports nationally important wintering numbers of common shelduck (*Tadorna tadorna),* Eurasian teal *(Anas crecca),* sanderling *(Calidris alba)* and redshank (*Tringa totanus)*. A nationally important breeding colony of little tern (*Sterna albifrons)* held an average of 37 pairs in the period 1987 to 1991. (Criteria 2a,2c,3a,3c).

Qualifying Features

Ramsar criterion 5
Assemblages of international importance:
Species with peak counts in winter: 9528 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.
Qualifying Species/populations (as identified at designation):
Species with peak counts in spring/autumn:
Common redshank, *Tringa totanus totanus*, 883 individuals, representing an average of 0.7% of the GB population (5 year peak mean 1998/9-2002/3)
Species with peak counts in winter:
Red knot, *Calidris canutus islandica*, W & Southern Africa (wintering) 2579 individuals, representing an average of 0.9% of the GB population (5 year peak mean 1998/9-2002/3)

Conservation Objectives

F.7.1.4 Conservation objectives are not produced for Ramsar Sites however as the site boundary covers the same area as Teesmouth and Cleveland Coast SPA (UK9006061), the conversation objectives listed above are considered applicable to this site.

Pressures and Threats

F.7.1.5 The Ramsar Information sheet (RIS) highlights eutrophication as the main factor adversely affecting the site's ecological character. However, this RIS dates from 1995 and needs updating to include addition pressures and threats currently ongoing at the site, including physical habitat modification, public access/disturbance, direct land take from development, water pollution, fisheries (commercial and recreational), undergrazing, inappropriate water levels, coastal squeeze, change to site conditions and air pollution, among others.