

# **SUFFOLK WATER RECYCLING, TRANSFER & STORAGE**

## **EIA SCOPING REPORT VOLUME I: MAIN REPORT**

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# 1 Introduction

## 1.1 Purpose of this Report

- 1.1.1 This Environmental Impact Assessment ('EIA') Scoping Report has been prepared to support a request for a Scoping Opinion from the Secretary of State for Environment, Food and Rural Affairs (the 'SoS'), for the purposes of Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [1] and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) [2] [3], (the "EIA Regulations") for the Suffolk Water Recycling, Transfer and Storage Project ('SWRTS'), hereafter referred to as the 'Proposed Development'. The Proposed Development comprises the construction, operation and decommissioning of a water infrastructure project.
- 1.1.2 This Scoping Report has been prepared at an early stage in the design development of the Proposed Development. Certain elements, including infrastructure routing, operational parameters and regulatory requirements, remain subject to ongoing optioneering and engagement with statutory bodies. Where details are not yet fixed, the Scoping Report identifies the assumptions applied at this stage and proposes that the Environmental Statement ('ES') will adopt a precautionary approach based on a '*cautious worst case*' in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) [4].
- 1.1.3 The purpose of this Scoping Report is to establish the scope, including content and extent of matters which should be covered in the ES to be prepared and submitted for the Proposed Development. It also sets out the proposed assessment methodologies for the topics proposed to be scoped into the ES. The Scoping Report has been prepared with regard to the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment

(July 2026) for all environmental factors (topics) set out in the EIA Regulations.

- 1.1.4 In August 2025, the Applicant submitted a request to the SoS under Section 35 of the Planning Act 2008 ('PA 2008') [5] to request the Proposed Development be treated as a development for which development consent is required, given that the Proposed Development does not meet the statutory definition of an NSIP. The Applicant considered the Proposed Development to be nationally significant and as such requested a Section 35 direction.
- 1.1.5 In September 2025, the SoS responded to the Applicant's request and approved the Proposed Development to be classified as one that can be progressed by way of a Development Consent Order ('DCO') application under the PA 2008.
- 1.1.6 The Applicant intends to make an application for a DCO to authorise the Proposed Development. The DCO will include a description of the Proposed Development and will be accompanied by an ES prepared in accordance with the EIA Regulations with the Proposed Development falling under Schedule 2 of both regulations (refer to paragraph 1.1.1).

### The Applicant

- 1.1.7 Northumbrian Water Limited (trading as Essex and Suffolk Water Limited) (the 'Applicant') is progressing the Proposed Development. Essex and Suffolk Water Limited ('ESW') is a trading division of Northumbrian Water Limited, which is a group company of the Northumbrian Water Group. Northumbrian Water Group is a statutory undertaker that provides mains water and sewerage services in Northumberland, Tyne and Wear, Durham and parts of North Yorkshire, and supplies potable water in Essex, Suffolk and Norfolk as ESW. ESW operates in two distinct areas, one serving Norfolk and Suffolk, and the other serving Essex and Greater London.

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## 1.2 The Need for the Proposed Development

- 1.2.1 The purpose of the Proposed Development is to provide a resilient and secure water supply to the east of England, as it is anticipated that the east of England will face severe water shortages that will constrain agricultural production and curtail economic growth, impacting the region's prosperity and endangering existing watercourses, peatlands and wetlands. The water stressed status of this region was recognised by Ofwat (the Water Services Regulation Authority) in 2021 [6].
- 1.2.2 The Proposed Development's critical objectives (i.e. the actions that aim to alleviate the issues highlighted above) are summarised below:
1. Objective 1 – To meet the urgent need to increase the supply of potable water to Hartismere Water Resource Zone ('WRZ').
  2. Objective 2 – To meet the need to enhance the resilience of water supply and reduce the impacts of drought measures.
  3. Objective 3 – To meet the urgent need to reduce reliance on unsustainable water abstraction and increase protections for environmentally sensitive habitats.
  4. Objective 4 – To meet the need for the Proposed Development to be technically feasible.
  5. Objective 5 – To meet the need for the Proposed Development to be carried out in compliance with health and safety legislation.
  6. Objective 6 – To meet the urgent need to deliver low carbon energy productions at Sizewell C Nuclear Power Station ('SZC').
  7. Objective 7 – To meet the need for the Proposed Development to be deliverable within critical timeframes.
- 1.2.3 The Proposed Development would also make a significant contribution to the UK Government's environmental objectives, international commitments and policy priorities by protecting river habitats, removing the environmental risks and impacts from emergency drought permits and drought orders that would otherwise have to be deployed in drought conditions to maintain essential water supplies. It will also facilitate the long-term supply of mains water to SZC.



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## 1.3 Overview of the Proposed Development

- 1.3.1 The Proposed Development is primarily located in East Suffolk and Mid-Suffolk, with components spanning from Saxmundham and Leiston towards the south, Finningham to the west and Lowestoft to the north. The EIA Scoping Area of the Proposed Development can be found in Figure 1-1 and Figure 1-2, which outline the EIA Scoping Area with the respective county and local planning authority boundaries. Figure 1-3 shows the EIA Scoping Area in greater detail across Suffolk and Norfolk.

### Proposed Advanced Water Recycling Plant (AWRP)

- 1.3.2 The Proposed Development will include a proposed Advanced Water Recycling Plant ('AWRP'). The AWRP will receive treated wastewater from the existing Lowestoft Water Recycling Centre ('WRC') owned and operated by Anglian Water ('AW'). The construction of a new pumping station and potential minor modifications to the existing works at the Lowestoft WRC are proposed, to then divert treated wastewater to the proposed AWRP.

### Proposed Service Reservoirs

- 1.3.3 Two proposed Service Reservoirs ('SRs') for the storage of drinking water, located at strategic locations for onward supply and storage, also comprise part of the Proposed Development.

### Proposed Underground Pipelines

- 1.3.4 The Proposed Development also includes a network of proposed underground pipelines. The proposed underground pipelines will connect existing infrastructure to proposed infrastructure, for the transfer of new water sources to be treated for onward supply and storage. These consist of the following key proposed pipeline routes:
- A proposed pipeline from the proposed AWRP to a proposed outfall on the River Waveney transferring up to 11 mega litres per day ('Ml/d') of recycled water subject to final design and environmental permitting. The recycled water is to be discharged into the River Waveney. Abstraction from the River Waveney would be via the existing Barsham Water Treatment Works ('WTW') abstraction point near Shipmeadow.

- A proposed long sea outfall ('LSO') to dispose of the concentrated residual water ('CRW') from the proposed AWRP is proposed with three potential options at the feasibility stage:
  - Option 1: A new offshore LSO, comprising a new pipeline discharging the CRW offshore via a diffuser.
  - Option 2: A connection to the existing Anglian Water outfall network at Lowestoft WRC.
  - Option 3: A new pipeline from the proposed AWRP to the existing Ness Point outfall structure, connecting into AW infrastructure at the point of discharge.
- A proposed pipeline from the existing Barsham WTW to the proposed Central Service Reservoir ('CSR') transferring up to 15MI/d of drinking water subject to final design and environmental permitting. In addition, a proposed pipeline connection will be made off the Barsham WTW to CSR pipeline, to the existing Walpole WTW.
- A proposed pipeline from the proposed CSR to the existing Saxmundham water tower for storage, transferring up to 7MI/d of drinking water subject to final design and environmental permitting.
- A proposed pipeline from the CSR to the WSR transferring up to 8MI/d of drinking water subject to final design and environmental permitting. This is where water will be stored before being fed into the current distribution network.
- A proposed pipeline from near the existing Saxmundham water tower to SZC transferring up to 2.9MI/d, subject to final design and environmental permitting.
- Proposed distribution mains from the proposed WSR to the existing network connection point near Eye, helping to deliver water to homes and businesses in the Blyth and Hartismere WRZs.

1.3.5 The Proposed Development would also comprise a range of associated development (as defined by Section 115(2) of the PA 2008) in addition to the components, which may include, but is not limited to:

- Landscaping and environmental mitigation measures intended to avoid or reduce potential environmental effects subject to the findings of the EIA.
- Accesses and utility connections as identified by the Applicant for the Proposed Development including electrical sub-stations, telecoms, water and sewerage facilities.
- Temporary works to support construction, works to support operation and maintenance, site accesses, temporary and permanent utility connections, highway diversions and landscaping and environmental

mitigation measures intended to avoid or reduce potential environmental effects subject to the findings of the EIA.

## 1.4 Request for a Scoping Opinion

- 1.4.1 The purpose of this Scoping Report is to formally request a Scoping Opinion from the SoS in accordance with the EIA Regulations on the scope, level of detail and information to be provided in the ES to ensure a proportionate EIA. Through this Scoping Report, the Applicant seeks the SoS's opinion on the proposed scope of environmental topics, study areas and assessment methodologies, including confirmation of those matters proposed to be scoped out of further assessment and identification of any additional matters requiring consideration within the ES.
- 1.4.2 The benefits of delivering a proportionate EIA, as defined by the Institute of Sustainability and Environmental Professionals ('ISEP') (2017) [7], formerly known as the Institute of Environmental Management and Assessment ('IEMA'), are to:
- Drive collaborative action and understanding across the EIA community.
  - Focus assessments so their findings are accessible to all stakeholders.
  - Reduce uncertainty and risk within project consenting.
  - Save time and costs for developers, consenting authorities and consultees.
  - Allow more time to be spent exploring the delivery of environmental improvements.
- 1.4.3 This Scoping Report has been prepared by Stantec, ISEP qualified assessors, on behalf of the Applicant with regard to the Proposed Development (as described in Sections 1.3 and 1.6).
- 1.4.4 This Scoping Report includes the information requested by Regulation 10(3) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as follows:
- A plan sufficient to identify the land (refer to Figure 1-1, Figure 1-2 and Figure 1-3).
  - A description of the Proposed Development, including its location and technical capacity (refer to chapter 2 the Proposed Development).

- An explanation of the likely significant effects of the Proposed Development on the environment (refer to chapters 6 to 22).
- Such other information or representations as the person making the request may wish to provide or make (refer to all figures and appendices provided).

## 1.5 Structure of the Environmental Impact Assessment Scoping Report

- 1.5.1 The Applicant has prepared a Scoping Report which presents an initial review of the potential impacts associated with the Proposed Development.
- 1.5.2 This Scoping Report identifies aspects which are proposed to be scoped out of the ES, subject to confirmation through the Scoping Opinion, and those aspects which are proposed to be scoped into further assessment. Chapters 4 and 5 expand on the technical disciplines and those aspects which are likely to be scoped out of, and into, the ES. The ES will be based on the Scoping Opinion adopted by the SoS, which is informed by the recommendations from consultees and the information contained within this Scoping Report.
- 1.5.3 The Scoping Report is provided in three volumes:
- Volume I Main Report.
  - Volume II Appendices.
  - Volume III Figures.
- 1.5.4 This Main Report (Volume I) is structured as below:

Table 1-1: Scoping Report Volume I Structure

| Chapter                     | Content                                                                                                                                                                                |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1: Introduction             | Introduces the Proposed Development, the structure and purpose of the Scoping Report as well as detail on planning policy and legislation.                                             |
| 2: The Proposed Development | Provides an overview of the Proposed Development, including a description of its principal components, and outlines the proposed construction, operational and decommissioning phases. |

| Chapter                           | Content                                                                                                                                                                                                                                                            |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3: EIA Methodology                | Outlines the background to the EIA, including the proposed structure of the technical ES chapters, the principles of the methodology that will be adopted in the ES and any consultation/engagement undertaken at the pre-application stage.                       |
| 4: Topics to be Scoped Out        | Presents the technical topics to be ‘scoped out’ from the ES whereby the Proposed Development is not anticipated to result in likely significant environmental effects in respect of these topics during its construction, operational and decommissioning phases. |
| 5: Topics to be Scoped In         | Presents the technical topics to be ‘scoped in’ to the ES, whereby the Proposed Development is anticipated to result in likely significant environmental effects.                                                                                                  |
| 6-22: Topic Chapters              | Set out the topics proposed to be included in the scope of the ES.                                                                                                                                                                                                 |
| 23: Cumulative Effects Assessment | Sets out the proposed methodology for evaluating cumulative effects.                                                                                                                                                                                               |
| 24: Summary                       | Summarises the Scoping Report.                                                                                                                                                                                                                                     |

## 1.6 The SWRTS Project Team

- 1.6.1 The preparation of the EIA is being led by Stantec working with Jacobs Engineering (‘Jacobs’). The ES will be prepared by competent experts, pursuant to Regulation 14(4) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and will outline the relevant expertise or qualifications of the experts. Freeths LLP is the legal advisor to the project team for the DCO application.

Table 1-2: SWRTS Project Team

| Topic                    | Author  |
|--------------------------|---------|
| Terrestrial Biodiversity | Stantec |
| Freshwater Biodiversity  | Stantec |
| Marine Biodiversity      | Jacobs  |

| Topic                            | Author  |
|----------------------------------|---------|
| Water Environment                | Jacobs  |
| Landscape and Visual             | Jacobs  |
| Terrestrial Historic Environment | Stantec |
| Marine Historic Environment      | Stantec |
| Traffic and Access               | Stantec |
| Noise and Vibration              | Stantec |
| Air Quality and Odour            | Jacobs  |
| Climate Change                   | Stantec |
| Socio-economics                  | Stantec |
| Human Health                     | Stantec |
| Ground Conditions                | Stantec |
| Agricultural Land and Soils      | Jacobs  |
| Materials and Waste              | Jacobs  |
| Major Accidents and Disasters    | Jacobs  |

## 1.7 Approach to Planning Policy

### Planning Legislation

- 1.7.1 The EIA requirement for projects progressed by DCO under the PA 2008 is transposed into law through the EIA Regulations. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 specify which developments are required to undergo EIA and schemes relevant to the PA 2008 planning process are listed under either ‘Schedule 1’ or ‘Schedule 2’ (or Schedule A1 or A2 for The Marine Works (Environmental Impact Assessment) Regulations as amended in 2017). Those developments listed in ‘Schedule 1’ (or A1) must be subject to EIA, while developments listed in ‘Schedule 2’ (or A2) must only be subject to EIA if they are considered *‘likely to have significant effects on the environment by virtue of factors such as its nature, size or location’* (regulation 3(1) of The Infrastructure Planning (Environmental Impact Assessment) Regulations



2017 and regulation 8(1) of The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended). The selection criteria for Schedule 2 development are set out in Schedule 3 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017).

- 1.7.2 The Proposed Development is within the threshold set out in ‘Schedule 2’ of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Schedule 2 relates to development under category 10 (i) *‘dams and other installations designed to hold water or store it on a long-term basis (and is not a project listed in Schedule 1)’*.
- 1.7.3 The Proposed Development is also a ‘Schedule 2’ development under category 65 *‘Dams and other installations designed to hold water or store it on a long-term basis (not included in Schedule A1)’* of The Marine Works (Environmental Impact Assessment) Regulations 2007.
- 1.7.4 Following the completion of surveys, assessments and consultation processes for the Proposed Development, an application for a DCO will be made to the Planning Inspectorate on behalf of the SoS for determination in accordance with the PA 2008.
- 1.7.5 The Section 35 direction [8] received from the SoS confirmed that the Proposed Development is a DCO project that is still required to comply with local planning policy, where relevant.

## 1.8 National Policy Statements

- 1.8.1 National Policy Statements (‘NPSs’) designated by the UK Government are the starting point for the consideration and determination of DCO applications. Section 104 of the PA 2008 states that:

*‘(2) In deciding the application the Secretary of State must have regard to –  
(a) any national policy statement which has effect in relation to development of the description to which the application relates (a “relevant national policy statement”) (aa “the appropriate marine policy documents (if any),*

*determined in accordance with section 59 of the Marine and Coastal Access Act 2009')*

*(3) The Secretary of State must decide the application in accordance with any relevant national policy statement, except to the extent that one or more of subsections (4) to (8) applies.'*

**National Policy Statement for Water Resources Infrastructure (2023)  
[9]**

- 1.8.2 As there is no current indication that the NPSs will be revised before the DCO application is submitted to the SoS, the current National Policy Statement for Water Resources Infrastructure ('NPSWRI') would be relevant to the determination of the DCO application for the Proposed Development. It is the primary national policy document in relation to DCO applications for this type of development.
- 1.8.3 The NPSWRI was published in April 2023 (and most recently updated on 14 July 2025). It sets out the planning framework for nationally significant water infrastructure projects in England. The NPSWRI aims to streamline the consenting process for nationally significant water infrastructure projects. The policy supports the delivery of new water supply infrastructure to address increasing pressures on water availability due to population growth, climate change, and environmental needs. It aligns with the government's broader goals of ensuring resilient water supplies and sustainable development. The NPSWRI is underpinned by an Appraisal of Sustainability and a Habitats Regulations Assessment ('HRA'), ensuring environmental considerations are integrated into planning decisions.
- 1.8.4 As set out in paragraph 1.1.4 of the NPSWRI, where a water resources infrastructure development is treated as a development for which development consent is required through Section 35 of the PA 2008, the NPSWRI will apply. The SoS must decide an application in accordance with the NPSWRI, unless doing so would, amongst other things, result in adverse impacts of the development outweighing its benefits (paragraph 1.1.5).

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- 1.8.5 The NPSWRI (paragraph 2.1.3) notes that there is ‘*a critical and urgent need to build resilience in the water sector to address pressures on water supplies*’ driven by several factors.
- 1.8.6 The NPSWRI contains government policy that is relevant for the Proposed Development. It sets out:
- The urgent need for nationally significant water resources infrastructure.
  - The assessment principles against which applications are expected to be examined and determined.
  - More detailed guidance on the likely construction and operational impacts of national water resources infrastructure.
- 1.8.7 Section 1 of the NPSWRI sets out the background, scope and geographical coverage of the NPS, and the infrastructure covered by the NPSWRI. It also sets out the significance of water resource management plans (‘WRMPs’) in terms of supporting decisions on ‘*what additional water resources infrastructure is needed*’ (paragraph 1.4.3).
- 1.8.8 Section 2 of the NPSWRI sets out government policy and the need for water resources infrastructure, including:
- Current and predicted future pressure on water availability due to climate, demographic, economic and environmental factors.
  - The Government’s commitment to pursue a “twin track approach” to securing resilient water supplies, which requires both new water resources infrastructure and further demand management.
  - Quantifying the need for new water resources infrastructure.
  - The statutory role of WRMPs in identifying the need.
  - The role of NSIPs.
- 1.8.9 Section 3 of the NPSWRI outlines the assessment principles for water resources NSIPs, including a presumption in favour of granting development consent for projects that meet the identified need for infrastructure subject to the detailed policies and protections contained within the NPSWRI. It also sets out some general principles for EIA which are important in forming the approach to scoping, including:
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- *'Information gathered from the water resources management plan options appraisal assessments or information contained within section 4 may be useful to identify the significant effects of the proposed project' (paragraph 3.2.4).*
  - *'When examining an application for development consent, the Examining Authority must examine the environmental information... They must reach a reasoned conclusion on the significant effects of the proposed development and, if a Development Consent Order is made, whether monitoring measures should be imposed' (paragraph 3.2.5).*
  - *'When considering significant cumulative effects, any Environmental Statement should provide information on how the effects of an applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been granted)' (paragraph 3.2.6).*
  - *'The Examining Authority should consider how significant cumulative effects, and the interrelationship between effects, might as a whole affect the environment, even though they may be acceptable when considered on an individual basis or with mitigation measures in place' (paragraph 3.2.7).*
  - *'In some instances, it may not be possible at the time of the application for development consent for all aspects of the proposal to have been settled in precise detail. Where this is the case, the applicant should explain in its application which elements of the proposal have yet to be finalised, and the reasons why this is the case' (paragraph 3.2.8).*
- 1.8.10 Section 3.3 of the NPSWRI covers the HRA requirements, which is followed by section 3.4 covering Environmental Net Gain. Section 3.5 covers the assessment of alternatives and section 3.6 contains policies on the criteria for 'good design' for water resources infrastructure.
- 1.8.11 Section 4 of the NPSWRI Infrastructure outlines the generic impacts that must be considered by the SoS when assessing DCO applications. It provides detailed guidance for applicants on a wide range of environmental, social, and technical considerations that may arise during the construction and operation of such projects, alongside the specific planning requirements that applicants will need to meet, in order to gain development consent. These include impacts on air quality, biodiversity and nature conservation, greenhouse gas emissions and climate change mitigation, coastal change, and nuisances such as dust, odour, artificial light, smoke, and steam. The section also addresses flood risk, the historic environment, landscape and visual effects, land use including open space and green belt,
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noise and vibration, resource and waste management, socio-economic effects, traffic and transport, and water quality and resources. Each subsection sets out the potential impacts, relevant legislation and policy context, and expectations for mitigation or enhancement measures. The guidance in section 4 is intended to ensure that all relevant impacts are thoroughly assessed and managed, supporting sustainable development and informed decision-making for water infrastructure projects.

- 1.8.12 Although not as a standalone chapter, marine considerations are primarily addressed in the NPSWRI under section 1.2 (Geographical Coverage) and section 4.5 (Coastal Change). Section 1.2 clarifies that the NPSWRI applies to water resources infrastructure in England and in waters adjacent to England, which includes marine environments. Additionally, the supporting HRA considers impacts on European-designated marine sites, such as Special Areas of Conservation and Special Protection Areas under The Conservation of Habitats and Species Regulations 2017 [10]. Section 4.5 of the NPSWRI specifically deals with coastal change, including erosion and sea level rise, and outlines how applicants must assess and mitigate impacts on marine and coastal environments when proposing infrastructure projects that may affect these areas.

## **1.9 Essex and Suffolk Water, Water Resources Management Plan 2024 [11]**

- 1.9.1 ESW's Water Resources Management Plan 2024 ('WRMP24') has identified that the water supply in Suffolk will face a baseline supply/demand deficit in the future. The WRMP24 indicated that mitigations need to be in place by 2032/2033 to avoid a deficit to supply.
- 1.9.2 The baseline of ESW's WRMP24 supply and demand balance forecasts results in a supply deficit in the Blyth and Hartismere WRZs from 2026/2027 and 2025/2026 respectively, when planning to provide a 1 in 500-year level of resilience. This is caused by new abstraction licence sustainability reductions that are required by the Environment Agency, new non-household demand and the forecast climate change using the latest UK

climate change projections (UKCP18). Under the baseline supply and demand balance, the Northern Central WRZ has a small surplus until 2031/32 and a deficit, thereafter, necessitating immediate measures to avoid further disruptions and ensure drought resilience.

- 1.9.3 The Applicant is currently operating a moratorium in the Hartismere WRZ (the 'Moratorium') on accepting new non-domestic water supply applications in order to maintain abstraction at, or below, current sustainable abstraction levels. The Moratorium has been put in place due to the lack of available water and to protect mains water supplies to existing household customers and businesses. It is expected to remain in place until approximately 2032, when the Proposed Development is programmed to be operational.
- 1.9.4 The WRMP24 identifies Barsham WTW as the site to treat and distribute additional water capacity, as this is a major WTW owned and operated by the Applicant, located in the area where the supply demand balance is required.

## 1.10 Marine Planning

- 1.10.1 The UK Marine Policy Statement [12] ('MPS') provides the policy framework for the marine planning system and provides the context for Marine Plans. Marine Plans, where they exist, put into practice the objectives for the marine environment that are identified in the MPS alongside the National Planning Policy Framework [13] ('NPPF') and the Marine and Coastal Access Act 2009.
- 1.10.2 There are 11 marine plan areas in England. For each marine plan area, there are policies in place to encourage sustainable development and balance the needs of the environment, economy, and society. A marine plan policy assessment needs to be complied with by a project located within any of these marine plan areas. In accordance with Marine Plan guidance [14], the Proposed Development should:
- 1.10.3 Consider marine plan policies at the pre-application stage;
- Consider the plan as a whole.

- Incorporate marine plan policy assessment using existing assessments, such as supporting assessments and evidence provided for relevant applications under The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended).
- 1.10.4 The Proposed Development is located within the 'East inshore' Marine Plan Area and therefore, the relevant policies from this marine plan area should be considered.

## 1.11 National Planning Policy Framework

- 1.11.1 The NPPF, the most recent version of which was issued in August 2026, sets out the government's planning policies for England and how these are expected to be applied. This Scoping Report was initially prepared based on the previous version of the NPPF (published in 2024, and most recently updated in February 2025), until the revised version was published in August 2026. It has been comprehensively reviewed and updated as appropriate following publication of the August 2026 NPPF.
- 1.11.2 Paragraph 13 of the NPPF outlines that the document does not contain specific policies for NSIPs, and they are instead determined in accordance with the decision-making framework in the PA 2008 and relevant National Policy Statements for major infrastructure, as well as any other matters that are relevant (which may include the NPPF). National Policy Statements form part of the overall framework of national planning policy and may be a material consideration in preparing plans and making decisions on planning applications.
- 1.11.3 This Scoping Report will therefore consider whether there is relevant guidance in the NPPF that may require consideration by the decision-making authority in relation to the relevant technical topic as per chapters 6-22.
- 1.11.4 Policy W1 (Planning for Energy and Water), introduced in the August 2026 NPPF, emphasises the need for early engagement between relevant plan-making authorities, utility providers, regulators and network operators to establish a clear understanding of energy supply, network capacity, water supply, drainage, and wastewater capacity. While Policy W1 relates



specifically to plan-making, it demonstrates a wider policy impetus to consider and address utility infrastructure requirements and constraints.

- 1.11.5 Policy W4 (Water Infrastructure), a new decision-making policy introduced in the August 2026 NPPF, advises that substantial weight should be given to the benefits offered by water infrastructure development proposals, and that applicants are not required to demonstrate the need for water infrastructure developments.

## 1.12 Local Planning Policy and Other Considerations

- 1.12.1 The NPSWRI notes that development plan documents or other documents in the Local Development Framework may be considered both important and relevant for decision making. However, as set out in paragraph 1.1.9, the NPSWRI notes *'in the event of a conflict between these or any other documents and a National Policy Statement, the National Policy Statement prevails for purposes of decision making given the national significance of the infrastructure'*.
- 1.12.2 For the Proposed Development, the local authorities defined as 'host authorities' and their policies and other relevant policy documents are listed in Table 1-3 below.

Table 1-3: Local Authority Planning Authorities and Policy Documents

| Local Authority                               | Local Planning Policy Documents                                                                                                                            |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| East Suffolk Council                          | East Suffolk Council - Waveney Local Plan 2014-2036 (March 2019) [15]<br>East Suffolk Council - Suffolk Coastal Local Plan 2018-2036 (September 2020) [16] |
| Babergh and Mid Suffolk Council               | Babergh and Mid Suffolk Joint Local Plan Part 1 2018-2037 (November 2023) [17]                                                                             |
| Great Yarmouth Borough Council                | Great Yarmouth Consolidated Local Plan 2013-2030 (Core Strategy Adopted December 2015, Local Plan Part 2 Adopted December 2021) [18]                       |
| Broads Authority                              | Local Plan for the Broads 2015 – 2036 (May 2019) [19]                                                                                                      |
| South Norfolk and Broadland District Councils | Adopted South Norfolk Local Plan (March 2024) [20]<br>Adopted Broadland Local Plan (March 2024) [21]                                                       |

| Local Authority          | Local Planning Policy Documents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suffolk County Council   | Suffolk Minerals & Waste Local Plan (July 2020) [22]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Norfolk County Council   | Norfolk Minerals and Waste Local Plan 2023-2038 (May 2025) [23]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Combined Strategic Plans | Greater Norwich Local Plan 2018 – 2038 (Adopted 2024) [24]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Neighbourhood Plans      | <p>Lound with Ashby, Herringfleet and Somerleyton Neighbourhood Plan 2014 – 2036 (July 2022) [25]</p> <p>Oulton Neighbourhood Plan 2021 – 2036 (March 2023) [26]</p> <p>Belton with Browston, Burgh Castle, and Fritton with St Olaves Neighbourhood Plan 2022 – 2038 (April 2025) [27]</p> <p>Carlton Colville Neighbourhood Plan 2020 – 2036 (May 2025) [28]</p> <p>Beccles Neighbourhood Plan 2019 – 2036 (September 2021) [29]</p> <p>Worlingham Neighbourhood Plan 2021 – 2036 (November 2022) [30]</p> <p>Mutford Neighbourhood Plan 2019 – 2036 (December 2019) [31]</p> <p>Shadingfield, Sotterley, Willingham &amp; Ellough Neighbourhood Development Plan 2023 – 2036 (June 2023) [32]</p> <p>Halesworth Neighbourhood Plan 2021 – 2036 (February 2023) [33]</p> <p>Laxfield Neighbourhood Plan 2018 – 2036 (April 2022) [34]</p> <p>Stradbroke Neighbourhood Plan 2016 – 2036 (March 2019) [35]</p> <p>Wilby Neighbourhood Plan 2018 – 2036 (May 2021) [36]</p> <p>Hoxne Neighbourhood Plan 2022 – 2037 (April 2024) [37]</p> <p>Eye Neighbourhood Plan 2018 – 2036 (May 2021) [38]</p> <p>Saxmundham Neighbourhood Plan 2022 – 2036 (July 2023) [39]</p> <p>Leiston Neighbourhood Plan 2015 – 2029 (March 2017) [40]</p> <p>Lowestoft Neighbourhood Development Plan (November 2025) [41]</p> |

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## 1.13 Other National Policy and Guidance

1.13.1 The following policy and guidance documents are other considerations of relevance for the Proposed Development:

- National Design Guide (2019, updated in 2021) [42].
- National Planning Policy for Waste (2014) [43].
- National Policy Statement for Ports (2026) [44].
- National Policy Statement for National Networks (2024) [45].
- Marine and Coastal Access Act 2009 [46].
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 [47].
- The Waste (England and Wales) Regulations 2011 [48].

1.13.2 Each topic chapter in this Scoping Report will set out the relevant legislation, policy and guidance. Ongoing developments in planning policy will be monitored and will be considered as appropriate, when undertaking the EIA. This will be reported on in the ES.

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## 2 The Proposed Development

### 2.1 Introduction

- 2.1.1 This chapter of the Scoping Report provides an overview of the Proposed Development, including a description of its principal components, and outlines the proposed construction, operational and decommissioning phases.
- 2.1.2 The Proposed Development is at an early stage of design and certain components remain subject to ongoing scheme development and stakeholder engagement. Where details are not yet fixed, this chapter describes the anticipated design envelope and maximum parameters.
- 2.1.3 The final parameters (both maximum and minimum, where relevant) will be confirmed and assessed in the Environmental Statement ('ES'). The ES will assess the likely significant effects of the Proposed Development and adopt a precautionary approach based on a '*cautious worst case*' in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) [1] as described further in chapter 3 EIA methodology.
- 2.1.4 The Proposed Development consists of two schemes set out in the Essex and Suffolk Water ('ESW') Water Resource Management Plan 2024 [2] ('WRMP24'). These comprise the 'Lowestoft Reuse' and the 'Suffolk Strategic Network and Storage Enhancements' ('SSN') schemes.

### 2.2 Project Overview

- 2.2.1 The principal components of the Proposed Development comprise the following:
- Proposed Advanced Water Recycling Plant ('AWRP').
  - Proposed AWRP to River Waveney Pipeline.
  - Proposed Long Sea Outfall ('LSO').

- Proposed Barsham Water Treatment Works ('WTW') to Central Service Reservoir ('CSR') Pipeline.
- Proposed CSR.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline.
- Proposed CSR Pipeline to Western Service Reservoir ('WSR') Pipeline.
- Proposed WSR.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

2.2.2 The geographical areas in which these principal components are proposed to be located are shown on Figure 1-3 and are referred to as 'sections of the EIA Scoping Area' where relevant in this Scoping Report. To note, principal components (shown on Figure 1-3) would not comprise the full spatial extent of land within each section of the EIA Scoping Area shown on Figure 1-3 and the working parameters for each component are described below. These will be refined and the ES will confirm the final parameters, including both maximum and minimum dimensions (as appropriate) of each component of the Proposed Development.

2.2.3 As discussed in paragraph 2.3.11, at the existing Barsham Water WTW, water will be abstracted from the River Waveney. This will utilise an existing abstraction point on the River Waveney and its pipeline connection to the Barsham Water WTW. These structures have been excluded from the EIA Scoping Area on the basis that no physical modifications are proposed to either as part of the Proposed Development.

2.2.4 Any subsidiary components to the principal components listed at paragraph 2.2.1 are described in the following sections.

2.2.5 Where the transfer of water is described in this chapter, this refers to potable (drinking) water unless otherwise specified.

2.2.6 The Proposed Development would also comprise a range of associated development (as defined by Section 115(2) of the Planning Act 2008 [3]) in addition to the components, which may include, but is not limited to:

- Landscaping and environmental mitigation measures intended to avoid or reduce potential environmental effects subject to the findings of the EIA.
- Accesses and utility connections as identified by the Applicant for the Proposed Development including electrical sub-stations, telecoms, water and sewerage facilities.
- Temporary works to support construction, works to support operation and maintenance, site accesses, temporary and permanent utility connections, highway diversions and landscaping and environmental mitigation measures intended to avoid or reduce potential environmental effects subject to the findings of the EIA.

## 2.3 Principal Components of the Proposed Development

### Proposed AWRP

2.3.1 The Proposed Development will divert treated wastewater from the existing Lowestoft Water Recycling Centre ('WRC') (owned and operated by Anglian Water) via the construction of a new pumping station (a subsidiary component) and potential minor modifications to the existing Lowestoft WRC, to the proposed AWRP through a proposed underground pipeline at a maximum output of 16 mega litres per day ('Ml/d'). The proposed AWRP is expected to extend to up to 9.5 hectares ('ha') in area.

2.3.2 At the proposed AWRP, the treated wastewater will go through an advanced purification (cleaning) process to meet the strict environmental standards set by the Environment Agency ('EA'), to ensure the water is safe to return to the natural environment.

2.3.3 During a water quality failure event, transfer from the existing Lowestoft WRC and to the River Waveney would cease and flows would be re-circulated through the proposed AWRP until such time that they were of suitable quality to be discharged to the river.

- 2.3.4 The proposed AWRP is expected to comprise main process buildings, kiosks for control equipment, standby generator with associated fuel storage, solar PV array, administration buildings, access, parking, delivery facilities and operational lighting and CCTV for security purposes. The maximum height of these buildings and structures is expected to be 11m.

### **Proposed AWRP to River Waveney Pipeline**

- 2.3.5 A proposed underground pipeline would transfer the recycled water from the AWRP into the River Waveney, where it will mix with the river's natural flow. The proposed pipeline is expected to transfer a maximum output of 11MI/d of recycled water to the River Waveney. At the point of discharge, measures will be taken to control the flow of water into the River Waveney. This may include the use of nature-based solutions. These measures are subject to design optionality, and the final design will be assessed in the ES.
- 2.3.6 In non-drought periods, the AWRP will operate in 'standby mode' to keep the process plant items operational, treating up to 1.8MI/d, which will either be discharged into the River Waveney or combined with the waste stream for discharge to sea via one of the three options for the proposed LSO, as discussed in paragraph 2.3.10 below.
- 2.3.7 Abstraction from the River Waveney would be via the existing Barsham WTW abstraction point near Shipmeadow. No amendments are proposed to the existing abstraction infrastructure or abstraction licence, as abstraction would remain within the existing permit limitations.

### **Proposed Long Sea Outfall ('LSO')**

- 2.3.8 During the AWRP treatment process, up to 5MI/d of the concentrated residual water ('CRW') that is made up of the removed contaminants and dissolved salts, must be disposed of in an environmentally safe manner.
- 2.3.9 This CRW will be disposed of in a controlled method in accordance with applicable environmental permits and regulatory requirements, including



those set by the EA and relevant provisions of the Water Framework Directive [4] ('WFD').

2.3.10 The method of safe disposal of the CRW is currently at the feasibility stage, with the potential options as follows:

- Option 1: A new offshore LSO, comprising a new pipeline discharging the CRW offshore via a diffuser.
- Option 2: A connection to the existing Anglian Water outfall network at Lowestoft WRC.
- Option 3: A new pipeline from the proposed AWRP to the existing Ness Point outfall structure, connecting into Anglian Water infrastructure at the point of discharge.

### Proposed Barsham WTW to CSR Pipeline

2.3.11 At the existing Barsham WTW, water will be abstracted from the River Waveney and treated to meet drinking water standards to ensure it is fit for human consumption.

2.3.12 Water will be transferred via a pipeline to a proposed CSR located near the existing Lodgewood water tower (located near Sibton) for storage to ensure a reliable supply of water for the network. Water will be transferred at a peak flow rate of up to 18Ml/d to provide a maximum output of 15Ml in any 24-hour period [5]. As paragraph 2.3.5 states, the proposed pipeline from the proposed AWRP to the River Waveney is expected to transfer a peak flow of up to 11Ml/d of recycled water to the River Waveney. The river is one source of water to the existing Barsham WTW and there are other existing sources of water feeding into the WTW which allows a greater peak flow rate from Barsham WTW to the CSR Pipeline. The proposed pipeline from Barsham WTW to the CSR will transfer a maximum output of 15Ml/d.

2.3.13 In addition, a pipeline connection (subsidiary component) will be made off the Barsham WTW to CSR pipeline, to the existing Walpole WTW for distribution of water to the local water network.

2.3.14 The construction of structures to upgrade the Barsham WTW has been completed, and these upgrades are currently undergoing commissioning,

which is expected to be completed in late 2026. These works constitute a separate project to the Proposed Development, which is anticipated to have been completed and be operational prior to the commencement of the Proposed Development's construction phase. This project will therefore be considered as part of the baseline conditions in the vicinity of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area.

### Proposed CSR

- 2.3.15 A proposed CSR will provide intermediate network storage along the proposed pipeline route. The CSR will have the capacity to store up to 17Ml of water. A pipeline (subsidiary component) will be provided from the proposed CSR to the existing Lodgewood water tower.
- 2.3.16 The CSR will require a site up to 3.5ha for a temporary construction area and following completion of the construction activities, up to 1.5ha for a permanent operational area within the 3.5ha area.

### Proposed CSR to Saxmundham Pipeline

- 2.3.17 A pipeline will transfer water stored at the proposed CSR to the existing Saxmundham water tower for storage. The water will be transferred at a maximum output of 7Ml/d.

### Proposed Saxmundham to SZC Pipeline

- 2.3.18 A pipeline will transfer water from the proposed CSR to Saxmundham pipeline to the north-west of Saxmundham to SZC, which was granted a Development Consent Order in 2022. The water will be transferred at a maximum output of 2.9Ml/d.

### Proposed CSR Pipeline to WSR Pipeline

- 2.3.19 To distribute the water to the current network, a pipeline will run from the proposed CSR to the proposed WSR located near the existing connection point at Eye. This is where water will be stored before being fed into the current distribution network.

- 2.3.20 Water will be distributed from the proposed CSR to the proposed WSR at a maximum output of 8MI/d.

### Proposed WSR

- 2.3.21 A proposed WSR located near Eye will store water before distribution into the current network, to ensure efficient distribution and network resilience. The WSR will have the capacity to store up to 13MI of water.
- 2.3.22 The WSR will require a site of up to 3ha for a temporary construction area and following completion of the construction activities, up to 1ha for a permanent operational area within the 3ha area.

### Proposed Eastern and Western Distribution Mains

- 2.3.23 Pipeline connections are proposed from the proposed WSR to the existing network connection points near Eye, helping to deliver water to homes and businesses in the Hartismere Water Resource Zone ('WRZ').
- 2.3.24 These pipeline connections will include the provision of the proposed eastern distribution mains to the south and west of the proposed WSR, and western distribution mains which are located near to Finningham. The flow rates in these pipelines will be subject to the demand downstream, and the flow rates will vary throughout the day, with peak flows in the morning and late afternoon. It is considered that the flow rates will be very low during the evenings.
- 2.3.25 A summary of the principal components of the Proposed Development is included in Table 2-1 below:

Table 2-1: Principal Components of the Proposed Development

| Component            | Description                                                                                                              |
|----------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Proposed AWRP</b> |                                                                                                                          |
| AWRP                 | Treated wastewater from the existing Lowestoft WRC will undergo advanced water recycling treatment at the proposed AWRP. |

| Component                          | Description                                                                                                                                                                                         |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Proposed LSO</b>                |                                                                                                                                                                                                     |
| LSO                                | A pipeline that will discharge CRW from the proposed AWRP into the sea at a distance offshore.                                                                                                      |
| <b>Proposed Service Reservoirs</b> |                                                                                                                                                                                                     |
| CSR                                | The CSR will provide intermediate network storage along the route from the abstraction at the River Waveney and existing boreholes to the existing Saxmundham water tower.                          |
| WSR                                | The WSR will be located near Eye and will help provide further intermediate network storage to ensure efficient distribution and network resilience.                                                |
| <b>Proposed Pipelines</b>          |                                                                                                                                                                                                     |
| AWRP to River Waveney              | A pipeline route will transfer recycled water from the proposed AWRP to a proposed outfall location along the River Waveney.                                                                        |
| Barsham WTW to CSR                 | A pipeline route will transfer water from the existing Barsham WTW to the proposed CSR for intermediate network storage.                                                                            |
| CSR to the WSR                     | A pipeline will transfer water from the proposed CSR to the proposed WSR for storage ahead of distribution.                                                                                         |
| CSR to Saxmundham Water Tower      | A pipeline route will transfer water from the proposed CSR to the existing Saxmundham water tower for storage ahead of distribution.                                                                |
| Saxmundham to SZC                  | A pipeline route will transfer water from the proposed CSR to Saxmundham pipeline to SZC.                                                                                                           |
| <b>Proposed Distribution Mains</b> |                                                                                                                                                                                                     |
| Eastern Distribution Mains         | The proposed eastern distribution mains form part of the pipeline connection from the proposed WSR to the existing distribution network, and are located to the south and west of the proposed WSR. |
| Western Distribution Mains         | The proposed western distribution mains form part of the pipeline connection from the                                                                                                               |

| Component | Description                                                                           |
|-----------|---------------------------------------------------------------------------------------|
|           | proposed WSR to the existing distribution network and are located near to Finningham. |

## Drought Scenario Assumptions

- 2.3.26 The maximum outputs provided in this chapter are based on the assumptions set out below. These rates and assumptions will be confirmed in the ES.
- 2.3.27 The proposed AWRP has been designed to provide a maximum output of 11MI/d to augment flows in the River Waveney (broadly during the March to November period) prior to abstraction at Barsham WTW, and alongside other schemes, alleviate forecasted supply-demand deficits associated with sustainability reductions, increases in non-household demand and the requirement to plan for future drought scenarios. The associated required continuous sweetening flow outside of this period is 1.2MI/d and is required to keep process plant items operational and ensure they can be brought back into service in a reasonable timeframe.
- 2.3.28 The components of the Proposed Development located to the south of the River Waveney have been designed for a maximum output of 15 MI/d from Barsham Water Treatment Works into the strategic network. Within the strategic network, this flow is apportioned as follows:
- 8 MI/d conveyed to the WSR.
  - 7 MI/d conveyed to Saxmundham Water Tower.
- 2.3.29 These flows represent the maximum design transfer capacity and would be the theoretical capacity in any drought conditions.

## 2.4 Construction Phase

- 2.4.1 The construction phase of the Proposed Development is expected to commence in 2029 and span approximately 3 years, with construction due to be completed in 2032. The first full year of operation would be 2033. The activities on-site will be to construct the infrastructure below with full details

of construction phase assumptions including construction hours, working patterns, programme and the duration of construction activities to be contained within the ES.

- 2.4.2 The indicative construction start date (2029) assumes that construction work will commence once the DCO is granted consent and all relevant requirements have been discharged. It is assumed that detailed design of some components of the Proposed Development will progress in parallel with the DCO examination stage.
- 2.4.3 The construction period for the proposed AWRP, LSO and AWRP to River Waveney Pipeline assumes that all components are constructed in parallel, as all components need to be in place to facilitate commissioning. The construction of these elements is expected to start in 2030. This is a slightly later date than the pipelines that are due to start construction in 2029 (as summarised below).
- 2.4.4 An indicative construction programme is provided as follows:
- The proposed AWRP, LSO and the AWRP to River Waveney pipeline is anticipated to commence in 2030 with an approximate 2.5 to 3-year construction period, with the first full year of operation being 2033.
  - Proposed pipelines' construction is anticipated to commence in Q4 2029 and be completed in Q3 2031.
  - The proposed CSR's construction is anticipated to commence in Q4 2029 and be completed in Q4 2030.
  - The proposed WSR's construction is anticipated to commence Q4 2030 and be completed in Q4 2031.
  - The proposed CSR's and WSR's commissioning for use is anticipated to commence in Q4 2030 and be completed in Q1 2032.
- 2.4.5 The sequencing of the construction programme has been developed collaboratively by the design and engineering teams, based on general construction principles and in line with appropriate commissioning strategies.

2.4.6 As a minimum, the ES will contain the following and will assess any associated likely significant effects during the construction phase of the Proposed Development:

- Location, size and indicative layout of temporary construction compounds (including any temporary water storage lagoons) and access tracks.
- The anticipated number of construction vehicle movements, including requirement for any hazardous or large (abnormal) loads.
- An Outline Construction Traffic Management Plan ('OCTMP') which will set out the measures for safe access and traffic management to avoid or mitigate impact on the local road network. The OCTMP will be informed by the assessment of likely significant effects on traffic and access.
- An Outline Construction Environmental Management Plan ('OCEMP') which will outline the environmental management matters beyond construction traffic (e.g. ecology, arboriculture, drainage, noise, lighting, waste management etc).
- The construction working days and hours and how these would be secured.
- External lighting during the Proposed Development's construction phase, including along pipeline construction working widths and at construction compounds.
- The expected nature and quantity of natural resources to be used in construction including the predicted volume and source, the likely significant effects of which will be assessed in the climate change and materials and waste chapters of the ES.

### Proposed AWRP

2.4.7 Construction of the proposed AWRP is considered to consist of the construction of process buildings, kiosks for electrical equipment, standby generator with associated fuel storage, administration buildings and parking and delivery facilities at a maximum height of 11m. The proposed AWRP site will be up to 9.5ha in area.

### Proposed LSO

2.4.8 The proposed construction method for a proposed LSO (Option 1) is anticipated to comprise the following key elements:



- A conventionally laid High-Density Polyethylene ('HDPE') pipeline from the proposed AWRP to a location set back up to 200m from the cliff top (which accounts for future coastal erosion projections). A HDPE pipeline is proposed due to the composition of the CRW and the installation method/location.
- A Horizontal Directional Drilled ('HDD') section from the onshore set-back location, beneath the foreshore and associated structures out to sea.
- The HDD section would either extend directly up to 1km offshore and terminate with a diffuser structure or extend up to 500m offshore and join with a 500m section laid within a trench on the seabed extending out to the diffuser structure.

2.4.9 Options 2 and 3 for the LSO would involve the construction of a pipeline from the proposed AWRP to the existing Lowestoft WRC or the existing outfall infrastructure at Ness Point.

### Proposed Underground Pipelines

2.4.10 A series of techniques will be used for the construction of the proposed underground pipelines. These techniques are described below and will vary along the route depending on environmental sensitivity and physical constraints. The exact location and use of each of the crossing techniques will be subject to further site selection and consultation. The parameters will be confirmed in the ES, including construction working width for each installation method proposed. If this is not known, a 'cautious worst case' scenario will be applied and assessed. The ES will also state the mechanism through which the parameters will be secured.

2.4.11 The outer diameter ('OD') of the proposed pipeline network is expected to comprise the following:

- Proposed AWRP to River Waveney pipeline: up to 450mm OD.
- Proposed pipeline from Barsham WTW to CSR: up to 630mm OD.
- Proposed pipeline from CSR to Saxmundham: up to 400mm OD.
- Proposed pipeline from Saxmundham to SZC: up to 280mm OD.
- Proposed pipeline from CSR to WSR: up to 400mm OD.
- Proposed Distributions Mains: up to 355mm OD for the eastern distribution mains. The western distribution mains would be up to 180mm OD.

- 2.4.12 The pipe material will be selected to provide the optimal combination of durability and capacity to manage large volumes of water and changes in landscape.

#### Open-Cut Method

- 2.4.13 Most of the proposed underground pipeline will be constructed using a trenched open-cut method considering most of the pipeline will cross agricultural land.
- 2.4.14 This technique comprises digging a trench and laying the pipeline within the trench. The trench is then backfilled with the excavated material, as much as possible. The minimum depth of cover for pipeline constructed using the open cut method is expected to be 0.9m to 1.2m, with the majority of pipelines expected to be less than 3m in depth to trench formation (bottom of the excavation). Trenching between 3m-5m in depth may be used to avoid constraints and if any pipework is required at more than 5m, then trenchless crossings would be used.
- 2.4.15 A typical working width for the open cut method is considered to be up to 40m.
- 2.4.16 Temporary working widths and construction corridors will be refined as the scheme development process progresses. This working width includes the trench excavation, stockpile of excavated material including the separation of topsoil, working area and haul roads.

#### Trenchless Methods

- 2.4.17 Sections of the proposed underground pipelines will cross underneath roads, railways, waterbodies and some environmentally sensitive areas, which will restrict the construction methods used. As such, trenchless methods may be considered to be more appropriate, including HDD, tunnelling and micro tunnelling. Details of these construction techniques are outlined below.

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## HDD

- 2.4.18 HDD encompasses the use of a directional drilling machine to drill along a pre-established bore pathway in order to lay the path for the pipe. Two construction compounds are established either side of the asset that will be crossed. The directional drilling machine is driven along the chosen path until it reaches the opposite construction compound reception shaft, and a pipeline is laid through the hole. Drilling fluid, for example, bentonite, is often used to provide lubrication during the drilling and to ensure the drilled tunnel does not collapse on itself.

## Tunnelling

- 2.4.19 Where tunnels are required, a tunnel boring machine ('TBM') will be used. Shafts will be dug at each end of the tunnel, comprising a launch shaft where the TBM will begin and a reception shaft where the TBM will emerge and finish. Once the tunnel has been completed, the TBM will be dismantled and removed ready for the laying of the pipeline within the tunnel.

## Microtunnelling

- 2.4.20 This technique involves the use of a microtunnel boring machine which are normally remotely controlled. The microtunnel boring machine is drilled through the ground using manufactured jacking pipes held up by hydraulic pistons. These pistons help push the pipes and microtunnel boring machine forward at an efficient rate. Once the tunnel is drilled, the laying of the pipeline can take place.

## Temporary Site Compounds

- 2.4.21 Temporary site compounds would be located at suitable intervals along the proposed pipeline route. The site compounds are expected to comprise office buildings, welfare facilities, parking and storage areas. Where required and depending on the pipeline construction methodology being used, the site compounds may also include any launch or reception shafts required for tunnelling or trenchless construction activities as discussed above.

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## Proposed Service Reservoirs

- 2.4.22 The proposed CSR and WSR are expected to be constructed using pre-cast concrete walls with an in-situ concrete base and in-situ concrete screen for a roof. The backfill from the dugout hole will cover the concrete structure. The CSR will require a construction site area of up to 3.5ha and the WSR will require a construction site area of 3ha.

## Proposed Eastern and Western Distribution Mains

- 2.4.23 The proposed western and western distribution mains, similarly, to the proposed underground pipeline sections, are expected to be installed using the open cut method. However, some sections may need to be installed via trenchless crossing techniques.

## 2.5 Operational Phase

### Proposed AWRP

- 2.5.1 It is intended that the proposed AWRP will receive treated wastewater from the existing Lowestoft WRC. At the AWRP, a tertiary treatment plant ('TTP') consisting of a Moving Bed Biofilm Reactor will remove common nutrients and contaminants, for example, ammonia, phosphorus and residual solids from the treated wastewater. It is then intended that the water from the TTP will then pass through an ultrafiltration ('UF') membrane, followed by a reverse osmosis ('RO') membrane. This will reduce the salinity and remove most of the chemical contaminants within the wastewater. The membrane filtration process is expected to remove all particulate matter down to approximately 0.001 microns, along with residual chemicals, particularly perfluorooctanoic acids ('PFOA') and perfluorooctanoic sulfonates ('PFOS'), belonging to the PFAS group.
- 2.5.2 The next stage involves Ultraviolet Advanced Oxidation Process whereby pathogens are disinfected and residual harmful pollutants not removed by the RO are broken down. To ensure the water is suitable to be returned to the environment, minerals such as lime are added for conditioning.

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- 2.5.3 During operation, the proposed AWRP will treat a maximum output of 16MI/d of treated wastewater and transfer up to 11MI/d of recycled water to the River Waveney.
- 2.5.4 The mixture of water and particles removed during the water treatment process will produce a residual wastewater stream. During operation, of a maximum output of 16MI/d, up to 5MI/d of CRW will be produced and released from the proposed LSO to the North Sea (via either of the three LSO options).
- 2.5.5 The proposed heights of the separate process unit buildings will vary, with the tallest building height considered to be the dewatering facility at a height of up to 11m above ground level. The RO and UF buildings will be at a similar height of up to 10m above ground level. The heights of the additional buildings across the proposed AWRP site will range between 3m and 7m above ground level.
- 2.5.6 The proposed AWRP is expected to be operational 24 hours a day, 7 days a week, and managed by three full-time operational and maintenance operatives. The proposed AWRP would include a standby generator with associated fuel storage. Expected energy requirements for the proposed AWRP (and other relevant components of the Proposed Development), including the predicted demand and source will be outlined in the ES.
- 2.5.7 Chemicals will be delivered to the proposed AWRP site including Ferric, Polyelectrolyte, Sodium Hypochlorite, Citric Acid and Lime. The details on the number of these deliverables are not yet known and will be subject to further detailed design. Sludge removal tankers will visit the AWRP once a week during a maximum output of 16MI/d.
- 2.5.8 Operational lighting will be required for the AWRP, including external lighting surrounding the site and around the buildings. Lighting is expected to be primarily for security purposes and will likely comprise Passive Infrared ('PIR') [6], with task lighting for ad hoc or emergency maintenance.
-

No areas of the AWRP are expected to be permanently lit. Internal lighting will be provided within the proposed AWRP buildings.

### Proposed LSO

- 2.5.9 The proposed LSO will discharge CRW from the proposed AWRP to the North Sea (via either of the three LSO options). At this scoping stage, it is expected that the frequency of CRW discharge would be daily.

### Proposed Underground Pipelines

- 2.5.10 A network of proposed pipelines, connecting existing infrastructure to proposed infrastructure, transferring new water sources to be treated for onward supply and storage will be up to 120km in total length for the Proposed Development.
- 2.5.11 Along the proposed pipeline routes, a series of fittings may be required, including air valves, washouts, line valves and overflow pipelines for the proposed CSR and WSR.
- 2.5.12 Air valves are typically expected to be located every 500m along the pipeline route at every high point along the vertical alignment of the pipeline, and at long/descending sections and sharp changes in direction. Air valves are used to release air during the operation of the Proposed Development and will allow for the intake of air to protect the pipeline from vacuum pressures. Most of the valves will be located in below ground structures. However, some may be required to be above ground, particularly in fields.
- 2.5.13 Washouts will be located at each watercourse crossing and typically expected to be every 500m along the vertical alignment of the pipeline. Washouts will help drain the pipelines and are required for their maintenance. Similarly to air valves, most washouts will be located below ground with chamber lids. However, if located within a field, this may be raised above ground for easy access for maintenance purposes. The discharge from the washout will be via temporary overland piping or through permanent discharge arrangements to a local watercourse.

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- 2.5.14 Line valves are typically expected to be located every 5km along the vertical alignment of the pipeline and either side of major crossings. Line valves are used to allow isolation of sections of the pipelines for maintenance purposes.
- 2.5.15 The proposed CSR and WSR overflow pipelines are to provide a fail-safe mechanism to mitigate the consequence of any uncontrolled operational or structural scenarios. Although service reservoirs are designed with multiple operational and control safeguards, abnormal situations may occur and could include:
- Power outages affecting pumps or control systems.
  - Supervisory Control and Data Acquisition ('SCADA') or telemetry failures.
  - Pump or valve malfunction.
  - Other unforeseen external issues.
- 2.5.16 The overflow pipelines provide a controlled hydraulic pathway which safely moves excess water away from the proposed CSR and WSR once the maximum design water level is exceeded. The off-site pipework used for the overflow also forms part of the site drainage system with flow control measures implemented where required to ensure compliance with permitted discharge rates.
- 2.5.17 Temporary commissioning lagoons will be required along all the pipelines during the commissioning of the mains. This will be used to temporarily hold commissioning water before it is discharged into the environment (post-dichlorination and at a controlled discharge rate). The temporary commissioning lagoons are typically expected to be at most of the watercourse crossing as this will allow the water to be discharged into them.
- 2.5.18 The final parameters of the air valves, washouts, line valves, overflow pipelines and temporary commissioning lagoons, including minimum and maximum extents, will be confirmed and assessed in the ES. Any operational maintenance activities associated with the pipelines will also be described and assessed in the ES, as relevant.
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### **Proposed CSR and WSR**

- 2.5.19 Once built, the proposed CSR and WSR components' embankments will be a maximum of 4m in height above the existing ground level.
- 2.5.20 The maximum built footprint of the operational CSR will be 1.5ha in area.
- 2.5.21 The maximum built footprint of the operational WSR will be 1ha in area.
- 2.5.22 There is no proposed operational lighting for the proposed CSR and WSR. At this scoping stage, it is assumed that permanent site 'standby' generators will not be required at the proposed CSR or WSR. Should power loss occur, generators would be brought onto the site.

### **Proposed Eastern and Western Distribution Mains**

- 2.5.23 The distribution mains are pipelines which will transfer water to customers within the strategic network and to the proposed WSR. The operational phase description is as described for all proposed underground pipelines above.

## **2.6 Decommissioning Phase**

- 2.6.1 The life cycle of the Proposed Development is assumed to be a minimum of 80 years. The ES will confirm if there are any components of the Proposed Development that may need to be dismantled or replaced on a shorter timeframe, for which assessment of likely significant effects would be undertaken if required.
- 2.6.2 Decommissioning activities for the Proposed Development are anticipated to involve the removal of above-ground infrastructure components (including the proposed AWRP, CSR and WSR). The underground infrastructure including pipeline components (and all LSO options) are anticipated to be left in situ (but could potentially be removed). The full detail on anticipated decommissioning activities will be included within the ES.

- 
- 2.6.3 Decommissioning works in relation to the Proposed Development will be undertaken using industry best standards and under the regulatory framework at that time. Materials will be reused or recycled where feasible and disposed of in accordance with the waste disposal requirements. Land that is no longer required for the operation of the Proposed Development would be restored in accordance with any relevant DCO requirements.
- 2.6.4 Where enabling works are required, these activities will be described in detail in the ES. Where it is considered that decommissioning activities and their effects will be similar to those identified during the construction phase of the Proposed Development, this will be identified in the ES, and the effects of decommissioning and construction may be assessed together. In some circumstances where there are similarities between construction and decommissioning activities, it may be appropriate for the EIA only to assess decommissioning impacts if material adverse impacts have been identified in respect of the construction phase.
- 2.6.5 A detailed DEMP will be agreed with the relevant authority as required by the DCO, prior to the commencement of decommissioning. The ES will assess the likely significant environmental effects associated with decommissioning of the Proposed Development, taking a precautionary approach based on realistic assumptions regarding removal of infrastructure and site restoration.

## 3 EIA Methodology

### 3.1 Introduction

- 3.1.1 This chapter will provide a background to the EIA, including the proposed structure of the technical Environmental Statement ('ES') chapters, the principles of the methodology that will be adopted in the ES and any consultation/engagement undertaken at the pre-application stage.
- 3.1.2 The EIA methodology has been developed to reflect the current stage of design and the presence of ongoing optioneering. Where details are not yet fixed, the Scoping Report identifies the assumptions applied at this stage and proposes that the ES will adopt a precautionary approach based on a '*cautious 'worst case'*' in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) [1].

### 3.2 Technical Assessments

- 3.2.1 Each ES chapter will follow the sub-headings outlined in Table 3-1 below to ensure the final ES is proportionate, transparent, consistent and accessible.

Table 3-1: Technical Chapter Format and Context

| Sub-Heading             | Context                                                                                                                                                                                                                                   |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Introduction            | This section will introduce the environmental discipline and the purpose for which the assessment is being undertaken.                                                                                                                    |
| Planning Policy Context | This section will include a summary of national, regional, and local policies of relevance to the environmental discipline and assessment. Where applicable, relevant legislation will also be summarised.                                |
| Assessment Methodology  | This section will provide an explanation of methods used in undertaking the technical study with reference to published standards, guidelines and best practice. The application of significance criteria will also be discussed. It will |

| Sub-Heading                | Context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | also outline any difficulties encountered in compiling the required information. <i>Where discipline-specific guidance or regulatory requirements apply, these will be clearly identified and any departures from the overarching methodology explained.</i>                                                                                                                                                                                                                                                                                                                                                        |
| Baseline Conditions        | This section will include a description of the environment as it is currently (at the time of writing the ES or at another identified appropriate point in time) (the 'existing baseline') and as it is expected to change if the Proposed Development were not to proceed (the 'future baseline' scenario). The method used to obtain baseline information will be clearly identified. Baseline data will be collected in such a way that the importance of the particular subject area to be affected can be placed in its context and surroundings so that the effects of the proposed changes can be predicted. |
| Likely Significant Effects | This section will identify the likely significant effects on the environment resulting from the construction, operational and decommissioning phases of the Proposed Development.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Mitigation Measures        | Adverse effects will be considered for mitigation and specific mitigation measures put forward, where practicable. Mitigation measures considered may be primary, secondary or tertiary mitigation measures. The extent of the mitigation measures and how these will be effective will be discussed. Where the effectiveness is uncertain or depends upon assumptions about operating procedures, data will be provided to justify these assumptions and monitoring programmes will be proposed to enable subsequent adjustment of mitigation measures, as necessary.                                              |
| Residual Effects           | The residual effects, i.e., the effects of the Proposed Development assuming implementation of proposed secondary and tertiary mitigation, will be determined. The residual effects represent the overall likely significant effect of the Proposed Development                                                                                                                                                                                                                                                                                                                                                     |

| Sub-Heading        | Context                                                                                                                                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | on the environment having taken account of practicable/available mitigation measures.                                                                                                                                                                                                        |
| Cumulative Effects | The inter-project cumulative effects of the Proposed Development and the identified committed developments will be assessed, as well as the intra-project cumulative effects of the Proposed Development i.e. the cumulative effects expected to arise solely from the Proposed Development. |
| Summary            | A summary of the assessment and conclusions will be provided at the end of each technical chapter.                                                                                                                                                                                           |

### 3.3 EIA Methodology

3.3.1 This chapter will set out the methodology used in the EIA and state the processes for determining:

- Existing baseline and future baseline conditions.
- Spatial and temporal scope.
- Assessment of likely significant effects.
- Approach to mitigation.
- Environmental enhancement.
- In-combination effects.
- Cumulative effects assessment.
- Transboundary effects.
- Consultation and engagement.

3.3.2 These elements are applied iteratively within each technical chapter to identify, assess and refine likely significant effects, taking account of mitigation and cumulative interactions.

3.3.3 The specific assessment methodologies for each topic are detailed within the relevant technical chapters.

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### Existing Baseline and Future Baseline Conditions

- 3.3.4 The existing baseline conditions will be established to identify the likely significant environmental effects of the Proposed Development. Data to inform the baseline has been obtained through desk-based assessments, site surveys and engagement with the Local Planning Authorities ('LPAs') and statutory consultees.
- 3.3.5 Each environmental topic chapter will contain a description of the existing environmental conditions based on the study area for that topic and the data available.
- 3.3.6 Future baseline conditions are also considered for each environmental topic. The identification of the future baseline conditions involves predicting the change between the existing baseline and a relevant future baseline year.
- 3.3.7 For some topics, the baseline environment is expected to change between the submission of the Scoping Report and the construction and operation of the Proposed Development. For these topics, these changes will be predicted to enable robust identification of the effects of the Proposed Development against a future baseline.
- 3.3.8 Future baseline conditions are predicted using professional judgement and will be explained further in the ES. The selection of future baseline years will reflect the anticipated timing of construction, operation and relevant committed developments, and will be explained on a topic-by-topic basis within the ES.

### Spatial and Temporal Scope

- 3.3.9 Each environmental topic will address the spatial scope (the distance from the Proposed Development) and temporal scope (time periods for when impacts would be assessed), within which significant environmental effects could occur.

- 3.3.10 An environmental effect will be categorised as either permanent or temporary. The duration of temporary effects comprises:
- Short-term: (up to 1 year).
  - Medium-term: (between 1 year and 5 years).
  - Long-term: (more than 5 years).
- 3.3.11 The ES will consider the potential for likely significant cumulative effects on the environment. The approach to the assessment of the likely significant cumulative effects of the Proposed Development is set out in chapter 23 cumulative effects assessment, comprising:
- Intra-project effects, which are also known as ‘interactive effects’ (those resulting from multiple impacts/aspects of the Proposed Development affecting a single receptor).
  - Inter-project effects (those resulting from the Proposed Development combined with other schemes in the area).

#### *Spatial Scope*

- 3.3.12 The spatial scope of the whole EIA Scoping Area (with county administrative areas) is shown in Figure 1-1. This is the EIA Scoping Area considered within the Scoping Report.
- 3.3.13 The ES will include an explanation of any changes made following EIA Scoping, including how environmental effects have been considered in finalising the Order Limits.
- 3.3.14 The EIA Scoping Area has been set on a ‘*cautious ‘worst case’’* in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026).
- 3.3.15 As stated in the NSIPs Pre-Application Advice on Environmental Impact Assessment, the Rochdale Envelope is employed where the nature of the Proposed Development means that some details of the whole project have not been confirmed at the time of assessment. The assessment uses available parameters to consider a ‘*cautious ‘worst case’’* approach.



- 3.3.16 Based on the EIA Scoping Area, each environmental discipline will identify appropriate study areas that consider specific receptors or resources to be considered for that discipline.
- 3.3.17 It should be noted that the River Waveney is excluded from the EIA Scoping Area on the basis that it is a natural feature and no physical modifications are proposed as part of the Proposed Development. However, any likely significant effects resulting from the change in flows between the Proposed Development's discharge outfall and the existing abstraction point have been considered in the relevant chapters of this Scoping Report.

#### *Temporal Scope*

- 3.3.18 The temporal scope is the likely time period over which significant effects on the existing and future baseline may arise. It covers the construction, operational and decommissioning phases of the Proposed Development. Each technical chapter will outline the temporal scope within the ES.

#### *Construction*

- 3.3.19 Construction phase effects include the temporary effects of construction activities and both the temporary and permanent effects of the physical impacts of the Proposed Development. Construction is expected to take place over a 3-year period from 2029 to 2032. Construction impacts will be adequately assessed within each technical chapter of the ES.
- 3.3.20 For pre-construction activities associated with the Proposed Development, no likely significant effects are predicted and no mitigation or management is required. As such, these activities are proposed to be scoped out of assessment in the ES. The projected list of proposed pre-construction activities (or permitted preliminary works) is below:
- Pre-construction ecological mitigation (including advanced planting or the erection of temporary barriers to protect ecological interests).
  - Environmental surveys and monitoring, geotechnical surveys, and other investigations for the purpose of assessing ground conditions (including the making of boreholes).
  - Site walkovers.

- Removal of plant and machinery.
- Above ground site preparation for temporary facilities for the use of contractors.
- Remedial work in respect of any contamination or other adverse ground conditions.
- Diversion and laying of apparatus.
- Receipt and erection of construction plant and equipment.
- The provision of temporary means of enclosure and site security for construction.
- The temporary display of site notices or advertisements.
- Installation of pre-site drainage, including pipework and outfalls (excluding the proposed long sea outfall component).

### *Operation*

- 3.3.21 Operational effects will occur during the operational phase following anticipated completion of construction in 2032. This will include effects resulting from the operation and maintenance of the Proposed Development. Operational impacts will be adequately assessed within each technical chapter of the ES.

### *Decommissioning*

- 3.3.22 Decommissioning phase effects will occur when the Proposed Development ceases to be operational, and the infrastructure is likely removed. The life cycle of the Proposed Development is assumed to be a minimum of 80 years. Decommissioning effects of the Proposed Development will be adequately assessed within each technical chapter of the ES.

### **Assessment of Likely Significant Effects**

- 3.3.23 Likely significant effects for environmental topics will be determined using the matrix set out in Table 3-4.
- 3.3.24 The matrix highlights the interaction between the magnitude of impact and sensitivity.

- 3.3.25 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the resulting effects can be either positive or negative.

#### *Impact Magnitude*

- 3.3.26 The methodology for determining the magnitude of an impact is set out in Table 3-2.

Table 3-2: Methodology for Assessing Magnitude

| Magnitude of Impact | Criteria for Assessing Impact                                                                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                | Total loss or major/substantial alteration to key elements/features of the baseline conditions such that the post development character/composition/attributes will be fundamentally changed.                                    |
| Medium              | Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.                                       |
| Low                 | A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes will be similar to the baseline condition. |
| Very Low            | Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.                                                                                                            |

#### *Sensitivity*

- 3.3.27 The sensitivity of a receptor is based on the relative importance of the receptor and its ability to absorb change using the scale set out below in Table 3-3.

Table 3-3: Methodology for Determining Sensitivity

| Sensitivity | Examples of a Receptor                                                                                                                                                                  |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High        | The receptor/resource has little ability to absorb change without fundamentally altering its present character or is of international or national importance.                           |
| Medium      | The receptor/resource has moderate capacity to absorb change without significantly altering its present character or is of high importance.                                             |
| Low         | The receptor/resource is tolerant of change without variance to its character, is of low or local importance.                                                                           |
| Very Low    | The receptor/resource is tolerant of change without detriment to its character or does not make a significant contribution to local character or distinctiveness and is not designated. |

### Significance

- 3.3.28 Significance of effect will be calculated using the matrix in Table 3-4 and clearly identified within the ES. This illustrates the interaction between impact magnitude and receptor sensitivity. Unless stated otherwise, in the technical ES chapters, only moderate and major effects will be considered as significant. Both minor and negligible effects will be considered as not significant. Where topic-specific legislation or guidance defines significance differently, this will be clearly explained and justified within the relevant ES chapter.
- 3.3.29 However, professional judgement will also be applied and may check the significance of an effect when necessary. This will take into account the professional's understanding of the balance between the magnitude of an impact and the sensitivity of the receptor and whether the effect is permanent or temporary, its frequency, whether it is reversible and the likelihood of occurrence.

3.3.30 Furthermore, some topic disciplines may have a methodology and significance criteria that differs from what has been outlined above. If this is the case, this will be outlined in the respective chapter.

Table 3-4: Effect Significance Matrix

| Magnitude | Sensitivity                     |                                 |                                 |                              |
|-----------|---------------------------------|---------------------------------|---------------------------------|------------------------------|
|           | High                            | Medium                          | Low                             | Very Low                     |
| High      | Major Adverse/<br>Beneficial    | Major Adverse/<br>Beneficial    | Moderate Adverse/<br>Beneficial | Minor Adverse/<br>Beneficial |
| Medium    | Major Adverse/<br>Beneficial    | Moderate Adverse/<br>Beneficial | Minor Adverse/<br>Beneficial    | Negligible                   |
| Low       | Moderate Adverse/<br>Beneficial | Minor Adverse/<br>Beneficial    | Negligible                      | Negligible                   |
| Very Low  | Minor Adverse/<br>Beneficial    | Negligible                      | Negligible                      | Negligible                   |

#### *Nature of Effect*

3.3.31 The criteria set out in Table 3-2, Table 3-3 and Table 3-4 consider the scale of change from the impact and the tolerance to change of the receptor and thus, are equally applicable to the consideration of either adverse (negative) or beneficial (positive) effects.

3.3.32 Effects will also be identified as to whether they are direct or indirect in nature:

- Direct – an effect without intervening factors (e.g. the removal of trees to allow for the construction of new structures for the Proposed Development).
- Indirect – an effect not directly caused by the Proposed Development (e.g. changes to the pattern of traffic movements across the road network as a result of a new road being constructed).

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*Duration of Effect*

- 3.3.33 The duration of an effect can be measured as short, medium and long-term, as stated above.
- 3.3.34 Effects will be identified as to whether they are permanent or temporary in nature:
- Temporary – an effect lasting only for a limited period of time.
  - Permanent – an effect lasting or intended to last or remain unchanged indefinitely.

*Reversibility of Effect*

- 3.3.35 Effects will be identified as to whether they are reversible or irreversible in nature:
- Reversible – an effect that is capable of being reversed so that the previous state is restored.
  - Irreversible – an effect that is not capable of being undone or altered.
- 3.3.36 The nature, duration and reversibility of effects will inform professional judgement when determining the overall significance of effects.

**Mitigation Hierarchy**

- 3.3.37 The mitigation hierarchy is a systematic approach used to minimise adverse effects of a project or scheme on the environment and people. It is a series of steps or principles to guide decision-making and prioritise activity. The ES will account for the mitigation hierarchy within each environmental discipline chapter.
- 3.3.38 The Institute of Sustainability and Environmental Professionals' ('ISEP') (formerly the Institute of Environmental Management and Assessment ('IEMA')) guidance document Implementing the Mitigation Hierarchy from Concept to Construction (2024) [2] states that mitigation falls into three categories:
- **Primary (inherent) mitigation:** An inherent part of the project design – it should be described in the design evolution narrative and included

within the project description (for example, reducing the height of a building to reduce visual impact).

- **Secondary (foreseeable) mitigation:** Further activity is required to reduce the likely significant adverse environmental effects (for example, lighting limits within the Proposed Development and landscaping to reduce visual impacts).
- **Tertiary (inexorable) mitigation:** Will be required, regardless of an EIA assessment, to meet legislative requirements and/or standard sectoral practices. For example, mitigation captured within an Outline Code of Construction Practice.

3.3.39 The mitigation categories will be applied in all of the technical chapters. Within the ES, the mitigation measures that require monitoring will be explained further to detail who will be responsible, the frequency of monitoring, reporting required and any remedial action required.

#### Environmental Enhancement

3.3.40 In addition to mitigation, opportunities to incorporate environmental enhancements and environmental net gain will be considered in the ES, where relevant. Environmental enhancement measures will be considered separately from mitigation and will not be relied upon to reduce the significance of adverse effects at the scoping stage.

#### Cumulative Effects Assessment

3.3.41 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 require the consideration of the potential impact of inter-relationships and cumulative effects of '*existing and/or approved development*' with the Proposed Development. The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) [3],[4] also require an ES to cover the cumulative effects of the project.

3.3.42 Chapter 23 cumulative effects assessment of the Scoping Report outlines the methodology for assessing the potential for likely significant cumulative effects of the Proposed Development. The methodology follows the Planning Inspectorate's NSIPs - Advice on Cumulative Effects Assessment [5].



- 3.3.43 Cumulative effects with ‘*other existing and, or approved development*’ (inter-project effects) are separate from an assessment of the intra-project effects, between aspects for the Proposed Development (such as between ecology and hydrology). These intra-project effects will be assessed within the relevant technical chapters.

### Transboundary Effects

- 3.3.44 Regulation 32 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and Regulation 18 of The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) require consideration of transboundary effects where a proposed development is likely to have significant effects on the environment in a European Economic Area (‘EEA’) State or when an EEA state is of the view that its environment is likely to be significantly affected by a proposed development.
- 3.3.45 Based on the information currently available, no likely transboundary effects associated with the Proposed Development have been identified. This will be kept under review as the EIA process progresses.

## 3.4 Alternatives and Design Evolution

- 3.4.1 The Alternatives and Design Evolution chapter of the ES will describe the evolution of the Proposed Development based on environmental constraints and reasonable alternatives studied by the Applicant.

## 3.5 Consultation and Engagement

- 3.5.1 The Planning and Infrastructure Act 2025 has changed the pre-application process for DCO applications by superseding the previous statutory consultation duties in Part 5 of the PA 2008. Under the current regime, applicants are no longer required to carry out statutory pre-application consultation under Sections 42 (consultation with prescribed consultees, local authorities and affected land interests), 47 (consultation with the local community) and 48 (publicising the proposed application) of the PA 2008.

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- 3.5.2 Instead, pre-application engagement and consultation is encouraged where it is proportionate, timely and supports the development of the proposed application. The Applicant recognises the benefits of consultation and engagement in identifying key issues early, improving scheme design, informing the application, and reducing the risk of delays and uncertainty during examination, and is undertaking a programme of consultation and engagement accordingly.
- 3.5.3 An initial round of public consultation was undertaken by the Applicant between 29 October 2025 and 17 December 2025 to consult with stakeholders and members of the public on the emerging proposals for the project. The technical disciplines included in the EIA were involved in the consultation and provided responses to the feedback received during the consultation period. A document summarising the feedback has been published ('You Said Report' (March 2026) [6]) and is structured around the main themes raised by respondents.
- 3.5.4 Additional consultation and engagement will be undertaken as the Project develops, with feedback considered in refining the proposals, assessment scope, methodology and mitigation where relevant. The outcomes will be documented in a consultation report, including how issues raised have been considered and, where appropriate, how feedback has informed the development of the Project.
- 3.5.5 The EIA Regulations set out environmental consultation and publicity requirements for DCO applications, including scoping, environmental information, consultation with consultation bodies where required, and publicity following submission. As such, in addition to the initial round of public consultation, between November 2025 and July 2026 a series of virtual meetings focused on the technical assessments anticipated to be scoped into the ES were held with the relevant LPAs to seek their feedback on the proposed assessment methodologies to be applied to these disciplines in the ES, prior to the submission of the Scoping Report to the Planning Inspectorate. Information on the engagement undertaken with the
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LPAs, as well as other stakeholders, is provided in each relevant technical chapter of the Scoping Report.

- 3.5.6 Following the completion of appropriate pre-application consultation, the DCO application for the Proposed Development will be prepared and submitted to the 'SoS' via the Planning Inspectorate. In line with The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('APFP Regulations') [7], the application will be accompanied by *'the environmental statement required pursuant to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and any scoping or screening opinions or directions'*.

### 3.6 The Use of Artificial Intelligence (AI)

- 3.6.1 The DCO application for the Proposed Development will include a statement on how AI has been used, such as in the ES. The statement will comply with the Planning Inspectorate guidance and assist in all stakeholders understanding the origin, purpose and accuracy of the information presented [8].

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## 4 Topics to be Scoped Out

### 4.1 Introduction

- 4.1.1 This section presents the technical topics proposed to be ‘scoped out’ from the Environmental Statement (‘ES’) whereby the Proposed Development is not anticipated to result in likely significant environmental effects in respect of these topics during its construction, operational and decommissioning phases.
- 4.1.2 The following discussion of the technical topics to be scoped out of the ES have been informed by professional judgement, the nature of the Proposed Development, initial baseline assessments including desk-based research and site surveys and correspondence with the Local Planning Authorities and statutory bodies.
- 4.1.3 The majority of topics identified in Schedule 4(5) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [1] and Schedule 3(5) of The Marine Works (Environmental Impact Assessment) Regulations 2007 [2] [3] are proposed to be scoped into the ES. Some topics are not assessed within a separate chapter but are instead considered within other relevant chapters (refer to chapter 5 topics to be scoped in for further information). Heat and Radiation is the only relevant topic included in the regulations which is not proposed to be scoped in, as explained below.

### 4.2 Heat and Radiation

- 4.2.1 Schedule 4(5)(c) of The Infrastructure Planning ((Environmental Impact Assessment) Regulations 2017 and Schedule 3(5)(c) of The Marine Works (Environmental Impact Assessment) Regulations 2007 require consideration of the likely significant effects of a proposed development from the emission of pollutants during construction and operation, including heat and radiation.

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- 4.2.2 Due to the nature of the Proposed Development as a water recycling, transfer and storage project, it is not anticipated that there would be any heat or radiation emitted during construction or operation that would result in likely significant effects. Heat and radiation are therefore proposed to be scoped out of the ES.

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## 5 Topics to be Scoped In

### 5.1 Introduction

- 5.1.1 This section presents the technical topics proposed to be ‘scoped in’ to the ES, whereby the Proposed Development is anticipated to result in likely significant environmental effects on the topics considered in this chapter.
- 5.1.2 The following technical topics to be scoped into the ES have been informed by professional judgement, the nature of the Proposed Development, initial baseline assessments including desk-based research and site surveys, and correspondence with the Local Planning Authorities and statutory bodies.
- 5.1.3 Detail on the technical topics proposed to be ‘scoped in’ to the ES is provided in chapters 6 to 22 of this Scoping Report and covers the following topics:
- Chapter 6 Terrestrial Biodiversity.
  - Chapter 7 Freshwater Biodiversity.
  - Chapter 8 Marine Biodiversity.
  - Chapter 9 Water Environment.
  - Chapter 10 Landscape and Visual.
  - Chapter 11 Terrestrial Historic Environment.
  - Chapter 12 Marine Historic Environment.
  - Chapter 13 Traffic and Access.
  - Chapter 14 Noise and Vibration.
  - Chapter 15 Air Quality and Odour.
  - Chapter 16 Climate Change.
  - Chapter 17 Socio-economics.
  - Chapter 18 Human Health.
  - Chapter 19 Ground Conditions.
  - Chapter 20 Agricultural Land and Soils.
  - Chapter 21 Materials and Waste.
  - Chapter 22 Major Accidents and Disasters.

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- 5.1.4 Additionally, likely significant coastal and intertidal effects and likely significant effects on maritime navigation resulting from the Proposed Development are not proposed to be considered within separate chapters of the Scoping Report, but within the relevant technical topic chapters listed above, where relevant.
- 5.1.5 This includes consideration of coastal and intertidal effects within chapter 6 terrestrial biodiversity, chapter 8 marine biodiversity, chapter 9 water environment and chapter 19 ground conditions, and consideration of effects on maritime navigation within chapter 13 traffic and access, chapter 17 socio-economics, chapter 18 human health and chapter 22 major accidents and disasters of this Scoping Report.

## 6 Terrestrial Biodiversity

### 6.1 Introduction

6.1.1 This chapter outlines the proposed scope and methodology for the assessment of the likely significant effects arising from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on terrestrial biodiversity, including designated sites, habitats and notable species. The assessment will be presented within an Environmental Statement (‘ES’) submitted with the application for a Development Consent Order (‘DCO’). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.

6.1.2 The EIA Scoping Area is shown on Figure 1-1. This chapter should be read in conjunction with the following chapters of this Scoping Report:

- Chapter 2 The Proposed Development.
- Chapter 3 EIA Methodology.
- Chapter 7 Freshwater Biodiversity.
- Chapter 8 Marine Biodiversity.
- Chapter 11 Water Environment.

6.1.3 Terrestrial biodiversity aspects considered within this chapter include:

- Designated sites: including their associated designated interest features within the Zone of Influence [1] (‘Zol’) of the Proposed Development.
- Habitats: all terrestrial habitats (including coastal habitats up to mean high water springs (‘MHWS’), including priority habitats within the Zol of the Proposed Development.
- Protected and notable species considered likely to occur within the Zol for the Proposed Development.
- Invasive and Non-Native Species (‘INNS’): INNS are considered for the Proposed Development as a potential effect on terrestrial biodiversity receptors.



- 6.1.4 The proposed scope and methodology for the assessment of the Proposed Development's likely significant effects on freshwater biodiversity and marine biodiversity is outlined within chapters 7 and 8 of the Scoping Report, respectively.
- 6.1.5 This terrestrial biodiversity assessment will be undertaken by a suitably qualified and experienced ecologist, holding relevant professional accreditation with the Chartered Institute of Ecology and Environmental Management ('CIEEM'). The current assessment lead has more than 20 years' experience in ecological consultancy and extensive experience in terrestrial biodiversity survey methodologies, and Environmental Impact Assessment ('EIA') for major infrastructure projects. They hold a BSc (Environmental Biology), a MSc (Ecology and Environmental Management), are a Chartered Environmentalist (CEnv), and a Full member of CIEEM.

## 6.2 Study Area

- 6.2.1 The proposed study areas for the assessment have been developed to identify terrestrial biodiversity receptors that may be directly, or indirectly, affected by the Proposed Development. Due to differing Zols over which terrestrial biodiversity receptors may be subject to impacts during the Proposed Development's construction, operational, and decommissioning phases, a range of study areas have been proposed. The Zols are likely to extend beyond the EIA Scoping Area, for example, where there is hydrological or habitat connectivity. The Zol will vary for different ecological features depending on their sensitivity to an environmental change, or the extent of their range. The selection of the study areas has been informed by the CIEEM's Guidelines for Ecological Impact Assessment in the UK and Ireland Version 1.3 (2018) [2] ('the CIEEM Guidelines'). Any identified impact pathways might lead to the inclusion of additional receptors, at differing distances, for the purposes of the assessment in the terrestrial biodiversity chapter of the ES.
- 6.2.2 Appendix 6.1 to this chapter sets out the legislation, policy and guidance relevant to terrestrial biodiversity. The relevant legislation and policy will be

updated accordingly through the EIA process and detailed fully within the ES.

- 6.2.3 For the desk-based study (comprising the initial collation of existing information relating to terrestrial biodiversity receptors), the study areas for each receptor are set out in Table 6-1, along with supporting justification.

Table 6-1: Desk-based Study Search Areas

| Terrestrial Biodiversity Receptor                                                                                                                 | Study Area                                                                                                                              | Justification                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| International sites including Special Areas of Conservation ('SACs'), Special Protection Areas ('SPAs'), Ramsar sites.                            | 10km radius from the EIA Scoping Area. Study area extended to include sites that are hydrologically linked to the Proposed Development. | In accordance with the CIEEM's Guidelines for Preliminary Ecological Appraisal (2017) [3] and considered the maximum distance for risk of indirect effects via impact pathways. The study area is sufficient to identify SACs designated for bats in accordance with the Bat Conservation Trust's ('BCT') Bat Surveys for Ecologists: Good Practice Guidelines (4 <sup>th</sup> edition) Bat Conservation Trust (2023) [4]. |
| Functionally Linked Land ('FLL') for qualifying bird features of SPA and Ramsar sites.                                                            | 5km radius around SPA or Ramsar, and where it interacts with the EIA Scoping Area.                                                      | The use of a 5km buffer around SPAs and Ramsar sites for the purpose of identifying FLL for qualifying bird species has been established within the Wintering Bird Survey Scope 2025/2026 (Appendix 6.3). This was reviewed by Natural England in October 2025, who raised no objection to the use of the 5km radius.                                                                                                       |
| Nationally and locally designated sites including Sites of Special Scientific Interest ('SSSIs'), National Nature Reserves ('NNRs'), Local Nature | 2km radius from the EIA Scoping Area. Study area extended to include sites that are hydrologically linked to                            | In accordance with the CIEEM's Guidelines for Preliminary Ecological Appraisal (2017) and considered the maximum                                                                                                                                                                                                                                                                                                            |

| Terrestrial Biodiversity Receptor                                                     | Study Area                             | Justification                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reserves ('LNRs'), County Wildlife Sites ('CWSs'), Roadside Nature Reserves ('RNRs'). | the Proposed Development.              | distance for risk of indirect effects via impact pathways.                                                                                                                                               |
| Protected species records.                                                            | 2km radius from the EIA Scoping Area.  | In accordance with the CIEEM's Guidelines for Preliminary Ecological Appraisal (2017) and considered the maximum distance for risk of indirect effects via impact pathways.                              |
| Bats.                                                                                 | 6km radius from the EIA Scoping Area.  | In line with the BCT's Good Practice Guidelines (2023), a 6km study area for bats will be used as this is the Core Sustenance Zone for barbastelle bat, which are known to be present in the local area. |
| Notable habitats [5].                                                                 | 500m radius from the EIA Scoping Area. | Considered the maximum distance for risk of indirect effects via impact pathways.                                                                                                                        |

6.2.4 The study area for field surveys to collect habitat data and species data will initially include all land within the EIA Scoping Area (refer to Figure 1-1), although as the design of the Proposed Development evolves, some areas may be removed from the study area if they are no longer relevant. Due to the mobility of some species, and in line with standard survey techniques, the study area will be extended from the EIA Scoping Area for certain species/species groups, such as otter (500m radius from the EIA Scoping Area) and water vole (200m radius from the EIA Scoping Area).

6.2.5 Where required, surveys will be conducted on ecological features within the predicted ZoI of the Proposed Development that are known or likely to be present based on best practice guidance.

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## 6.3 Consultation and Engagement

- 6.3.1 Since June 2025, the Applicant has held monthly virtual meetings with representatives from Natural England ('NE') and the Environment Agency ('EA'), referred to as the 'Environmental Stakeholder Forum'. These meetings have included discussions on the proposed approach to the assessment of the Proposed Development's likely significant effects on terrestrial biodiversity.
- 6.3.2 The Applicant has developed a Biodiversity Data Collection Strategy ('BDCS') (Appendix 6.2) which sets out the proposed approach, study area, and timing of the full range of terrestrial biodiversity surveys that will be undertaken to inform the design evolution and assessment of likely significant effects resulting from the Proposed Development.
- 6.3.3 The aim of the BDCS is to ensure that data collection activities are suitable and proportionate. The BDCS was initially shared with NE and the EA on 5 June 2025. Comments were received from the EA on 18 August 2025, requesting further detail on desk-based study methods, including buffer, data sets searched, organisations contacted and protocol for screening records. The BDCS was updated to account for the EA's feedback in September 2025.
- 6.3.4 Comments were provided by NE on 26 February and 11 March 2026 requesting clarification on the proposed survey approach for dormice and breeding birds. Further information was provided within an updated version of the BDCS on 8 May 2026 to respond to these comments. Comments were provided by NE and the EA on 12 June 2026 on this updated version of the BDCS. Further information was provided within a further updated version of the BDCS on 6 August 2026.
- 6.3.5 During October 2025, NE was engaged in relation to the detailed scope of proposed wintering bird surveys to be undertaken during the 2025/2026 winter period. The Applicant provided a draft Wintering Bird Survey Scope 2025/2026 (Appendix 6.3) to NE for comment on 14 October 2025, which included a detailed proposed methodology along with proposed survey
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areas. A subsequent meeting between the Applicant and NE was held on 16 October 2025, and a response from NE on the proposed scope of these surveys was received by the Applicant on 27 October 2025. The response from NE requested Sprat's Water and Marshes, Carlton Colville SSSI, along with its qualifying bird species, to be added to the list of designated sites (NE acknowledged that the SSSI's addition would not affect the proposed scope of wintering bird surveys). NE also requested bean goose and pink-footed goose were added to the list of target species for recording during the survey. The Wintering Bird Survey Scope 2025/2026 was then updated by the Applicant to account for these requests.

- 6.3.6 NE also advised on 27 October 2025 that the wintering bird survey area should be extended up to 500m beyond the boundary of the Proposed Development. The project team responded by email on 13 November 2025 explaining that the scope of 2025/2026 wintering bird surveys included a 500m survey corridor (250m either side of the centre of the pipeline route options), and the survey area for the relevant above-ground infrastructure (the proposed Advanced Water Recycling Plant ('AWRP') component) is the site plus a 250m radius. The use of this survey area for the 2025/2026 wintering bird surveys has provided a detailed overview of wintering bird use of the area and is considered proportionate for the stage of the emerging design for the Proposed Development given several options for the pipeline routes and permanent infrastructure were still possible, prior to the availability of the EIA Scoping Area shown on Figure 1-1. For the EIA Scoping Area (Figure 1-1), a more focused wintering bird survey would be undertaken in 2026/2027 using an extended survey area up to 500m from the EIA Scoping Area. The results of the 2025/2026 wintering surveys would also be used to develop surveys targeted to specific areas of interest during 2026/2027.
- 6.3.7 In addition to NE and the EA, the Applicant has been engaging with other stakeholders throughout the EIA process, including Local Planning Authorities, wildlife groups, and local communities. Key points discussed between these stakeholders and the Applicant include Biodiversity Net Gain

(‘BNG’) objectives for the project, the importance of peat and peat habitats, the use of the mitigation hierarchy, potential effects on designated sites, priority habitats and species, and the Local Nature Recovery Strategy (‘LNRS’).

## 6.4 Baseline Environment

- 6.4.1 The baseline environment in relation to terrestrial biodiversity within the study areas is summarised within the sections below.
- 6.4.2 Existing baseline information has been derived from a desk-based study and remote sensing, along with the results of wintering bird surveys undertaken between October 2025 and March 2026 inclusive. The sources for the baseline data are outlined in Table 6-2.

Table 6-2: Existing Baseline Data Sources

| Data Source                                                                   | Contents                                                                                                        | Date Data Accessed/Received |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------|
| Multi-Agency Geographic Information for the Countryside (‘MAGIC’) website [6] | Statutory designated sites.<br>Priority habitats.<br>Irreplaceable habitats.                                    | 17 June 2026                |
| Suffolk Biodiversity Information Service [7]                                  | Non-statutory designated sites.<br>Ancient/veteran trees.                                                       | 25 June 2026                |
| Norfolk Biodiversity Information Service [8]                                  | Non-statutory designated sites.<br>Ancient/veteran trees.                                                       | 25 June 2026                |
| AiDash [9]                                                                    | Habitats classified in accordance with the UK Habitat Classification System (v2) (‘UKHAB’).                     | 11 February 2026            |
| Wintering bird surveys                                                        | Information on wintering birds including qualifying species of nearby SPA/Ramsar sites, and schedule 1 raptors. | 27 March 2026               |

- 6.4.3 The Applicant has developed a BDCS (Appendix 6.2) which sets out the proposed approach, study area, and timing of the full range of terrestrial biodiversity surveys that will be undertaken to inform the design evolution

and assessment of likely significant effects resulting from the Proposed Development.

6.4.4 Terrestrial biodiversity receptors have been separated out by geographical areas referred to as ‘sections of the EIA Scoping Area’ based on the following components of the Proposed Development (refer to Figure 1-3):

- Proposed AWRP.
- Proposed Long Sea Outfall (‘LSO’).
- Proposed Central Service Reservoir (‘CSR’).
- Proposed Western Service Reservoir (‘WSR’).
- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works (‘WTW’) to CSR Pipeline.
- Proposed CSR to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C Nuclear Power Station (‘SZC’) Pipeline.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

6.4.5 Further information on each component is provided in chapter 2 the Proposed Development.

### Designated Sites

6.4.6 Table 6-3 provides a summary [10] of international sites within 10km of each section of the EIA Scoping Area, as shown on Figure 6-1. Marine designated sites are identified separately in chapter 8 marine biodiversity.

Table 6-3: Summary of International Sites within 10km of each EIA Scoping Area Section

| EIA Scoping Area Section | Designated Site      | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                               |
|--------------------------|----------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed AWRP            | Broadland SPA        | 6.3                                                         | Breeding birds: Bittern, Marsh Harrier.<br>Wintering birds: Bewick's Swan, Whooper Swan, Gadwall, Hen Harrier.                                                                                                                                                                               |
|                          | Broadland Ramsar     | 6.3                                                         | Diversity of wetland habitats and associated wetland bird species, as well as large numbers of rare plants and invertebrates.<br>Waterfowl assemblage of international importance.<br>Wintering birds: Bewick's Swan, Wigeon, Gadwall, Shoveler.                                             |
|                          | The Broads SAC       | 6.3                                                         | Freshwater habitats including lakes, mire, bogs, fens and wet woodland.<br>The habitats support the following species: Desmoulin's whorl snail, Fen orchid, Ramshorn snail, otter.                                                                                                           |
|                          | Breydon Water SPA    | 6.6                                                         | Breeding birds: Common Tern.<br>Wintering birds: Bewick's Swan, Golden Plover, Avocet, Lapwing Ruff, Wintering Waterbird Assemblage.                                                                                                                                                         |
|                          | Breydon Water Ramsar | 6.6                                                         | Extensive areas of mud flats.<br>Waterfowl assemblage of international importance.<br>Breeding birds: Common Tern.<br>Wintering birds: Bewick's Swan, Lapwing, Avocet, Black-tailed Godwit, Cormorant, Golden Plover, Shoveler, Greater White-fronted Goose, Wigeon.<br>Passage birds: Ruff. |



| EIA Scoping Area Section | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                    |
|--------------------------|----------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed LSO             | Broadland SPA                                | 4.2                                                         | As above.                                                                                                                                                                                         |
|                          | Broadland Ramsar                             | 4.2                                                         | As above.                                                                                                                                                                                         |
|                          | The Broads SAC                               | 4.2                                                         | As above.                                                                                                                                                                                         |
|                          | Breydon Water SPA                            | 5.9                                                         | As above.                                                                                                                                                                                         |
|                          | Breydon Water Ramsar                         | 5.9                                                         | As above.                                                                                                                                                                                         |
|                          | Benacre to Easton Bavents SAC                | 8.5                                                         | Coastal lagoons: a series of percolation lagoons have formed behind shingle barriers and are a feature of a geomorphologically dynamic system.                                                    |
| Proposed CSR             | Dew's Ponds SAC                              | 1.2                                                         | Great crested newt.                                                                                                                                                                               |
|                          | Minsmere to Walberswick Heaths & Marshes SAC | 7                                                           | Habitats including: drift lines, dry heath, and stony banks.                                                                                                                                      |
|                          | Minsmere-Walberswick SPA                     | 7                                                           | Breeding birds: Bittern, Marsh Harrier, Nightjar, Avocet, Little Tern, Gadwall, Shoveler, Teal.<br>Wintering birds: Hen Harrier, Gadwall, Greater White-fronted Goose, Shoveler.                  |
|                          | Minsmere-Walberswick Ramsar                  | 7                                                           | Mosaic of coastal habitats, including shingle beaches, dunes, estuarine mudflats, grazing marshes, lagoons, reedbeds and heathland. The site supports an outstanding diversity of breeding birds. |

| EIA Scoping Area Section                | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                            |
|-----------------------------------------|----------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed WSR                            | Waveney & Little Ouse Valley Fens SAC        | 6.8                                                         | Freshwater habitats including: fens, and fen meadow.<br>The habitats support the following species: Desmoulin's whorl snail.                                                                                                                                                              |
|                                         | Redgrave & South Lopham Fens Ramsar          | 6.8                                                         | Extensive example of lowland base-rich valley mire, with dry birch woodland, scrub and carr, floristically-rich fen grassland, mixed fen, wet heath and areas of reed and saw sedge. The site supports many rare and scarce invertebrates, including a population of the fen raft spider. |
| Proposed AWRP to River Waveney Pipeline | Broadland SPA                                | 0.2                                                         | As above.                                                                                                                                                                                                                                                                                 |
|                                         | Broadland Ramsar                             | 0.2                                                         | As above.                                                                                                                                                                                                                                                                                 |
|                                         | The Broads SAC                               | 0.2                                                         | As above.                                                                                                                                                                                                                                                                                 |
|                                         | Breydon Water SPA                            | 6.6                                                         | As above.                                                                                                                                                                                                                                                                                 |
|                                         | Breydon Water Ramsar                         | 6.6                                                         | As above.                                                                                                                                                                                                                                                                                 |
| Proposed Barsham WTW to CSR Pipeline    | Dew's Ponds SAC                              | 1.4                                                         | As above.                                                                                                                                                                                                                                                                                 |
|                                         | Broadland SPA                                | 2.4                                                         | As above.                                                                                                                                                                                                                                                                                 |
|                                         | Broadland Ramsar                             | 2.4                                                         | As above.                                                                                                                                                                                                                                                                                 |
|                                         | The Broads SAC                               | 2.4                                                         | As above.                                                                                                                                                                                                                                                                                 |
|                                         | Minsmere to Walberswick Heaths & Marshes SAC | 6.9                                                         | As above.                                                                                                                                                                                                                                                                                 |

| EIA Scoping Area Section            | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                  |
|-------------------------------------|----------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------|
|                                     | Minsmere-Walberswick SPA                     | 6.9                                                         | As above.                                                       |
|                                     | Minsmere-Walberswick Ramsar                  | 6.9                                                         | As above.                                                       |
| Proposed CSR to WSR Pipeline        | Dew's Ponds SAC                              | 2.1                                                         | As above.                                                       |
|                                     | Minsmere to Walberswick Heaths & Marshes SAC | 7.9                                                         | As above.                                                       |
|                                     | Minsmere-Walberswick SPA                     | 7.9                                                         | As above.                                                       |
|                                     | Minsmere-Walberswick Ramsar                  | 7.9                                                         | As above.                                                       |
|                                     | Waveney & Little Ouse Valley Fens SAC        | 8.4                                                         | As above.                                                       |
|                                     | Redgrave & South Lopham Fens Ramsar          | 8.4                                                         | As above.                                                       |
| Proposed CSR to Saxmundham Pipeline | Dew's Ponds SAC                              | 1.3                                                         | As above.                                                       |
|                                     | Sandlings SPA                                | 5                                                           | Breeding birds: Nightjar, Woodlark.                             |
|                                     | Alde-Ore & Butley Estuaries SAC              | 5.1                                                         | Estuary habitats including mudflats, sandflats, and salt marsh. |

| EIA Scoping Area Section            | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                   |
|-------------------------------------|----------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|                                     | Alde-Ore Estuary SPA                         | 5.1                                                         | Breeding birds: Avocet, Lesser Back-backed Gull, Little Tern, Marsh Harrier, Sandwich Tern<br>Wintering: Avocet, Ruff, Redshank. |
|                                     | Alde-Ore Estuary Ramsar                      | 5.1                                                         | Breeding birds: Lesser Back-backed Gull<br>Wintering birds: Avocet, Redshank.                                                    |
|                                     | Minsmere to Walberswick Heaths & Marshes SAC | 7                                                           | As above.                                                                                                                        |
|                                     | Minsmere-Walberswick SPA                     | 7                                                           | As above.                                                                                                                        |
|                                     | Minsmere-Walberswick Ramsar                  | 7                                                           | As above.                                                                                                                        |
| Proposed Saxmundham to SZC Pipeline | Minsmere to Walberswick Heaths & Marshes SAC | 0.04                                                        | As above.                                                                                                                        |
|                                     | Minsmere-Walberswick SPA                     | 0.04                                                        | As above.                                                                                                                        |
|                                     | Minsmere-Walberswick Ramsar                  | 0.04                                                        | As above.                                                                                                                        |
|                                     | Sandlings SPA                                | 2                                                           | As above.                                                                                                                        |
|                                     | Dew's Ponds SAC                              | 5.8                                                         | As above.                                                                                                                        |
|                                     | Alde-Ore & Butley Estuaries SAC              | 6.1                                                         | As above.                                                                                                                        |

| EIA Scoping Area Section            | Designated Site                       | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                   |
|-------------------------------------|---------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------|
|                                     | Alde-Ore Estuary SPA                  | 6.1                                                         | As above.                                                                        |
|                                     | Alde-Ore Estuary Ramsar               | 6.1                                                         | As above.                                                                        |
|                                     | Orfordness-Shingle Street SAC         | 9.6                                                         | Habitats including: coastal lagoons, vegetation of drift lines, and stony banks. |
| Proposed Western Distribution Mains | Waveney & Little Ouse Valley Fens SAC | 6.6                                                         | As above.                                                                        |
|                                     | Redgrave & South Lopham Fens Ramsar   | 6.6                                                         | As above.                                                                        |
| Proposed Eastern Distribution Mains | Waveney & Little Ouse Valley Fens SAC | 8.5                                                         | As above.                                                                        |
|                                     | Redgrave & South Lopham Fens Ramsar   | 8.5                                                         | As above.                                                                        |

6.4.7 Table 6-4 provides a summary of nationally and locally designated sites within 2km of each section of the EIA Scoping Area. These are shown on Figure 6-2.

Table 6-4: Summary of Nationally and Locally Designated Sites within 2km of each EIA Scoping Area Section

| EIA Scoping Area Section | Designated Site    | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                         |
|--------------------------|--------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed AWRP            | Lound Lakes CWS    | 2.4                                                         | Open standing water, acid grassland, fen, reedbed, and woodland. Bats, birds, invertebrates, amphibians and reptiles.                                                                                                                  |
| Proposed LSO             | Ness Point CWS     | 0                                                           | Over-wintering purple sandpiper.                                                                                                                                                                                                       |
|                          | Gunton Warren CWS  | 0                                                           | A mosaic of habitats including sand dunes, vegetated shingle and acid grassland.                                                                                                                                                       |
|                          | Corton Woods CWS   | 0.2                                                         | Excellent range of habitats, from scrub and woodland to short grassland and ponds.                                                                                                                                                     |
|                          | Gunton Pond CWS    | 0.3                                                         | Assemblage of water plants including water violet and fine-leaved water dropwort (which are both uncommon in Suffolk), as well as more commonly occurring species such as water plantain, water mint, water dock and yellow flag iris. |
|                          | Gunton Meadow CWS  | 0.3                                                         | The meadow is notable for large colonies of the rare and locally distributed green-winged orchid and adder's-tongue fern along with a large number of common spotted orchids, ox-eye daisy and agrimony                                |
|                          | Lound Lakes CWS    | 0.4                                                         | As above                                                                                                                                                                                                                               |
|                          | Foxburrow Wood CWS | 0.5                                                         | Mature, mixed woodland with a wide variety of tree species such as oak, ash, and hornbeam                                                                                                                                              |

| EIA Scoping Area Section | Designated Site                        | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                               |
|--------------------------|----------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Great Eastern Linear Park CWS          | 0.6                                                         | Linear stretch of habitat creating a corridor for wildlife in the heart of Lowestoft.                                                                                                                        |
|                          | Lowestoft Harbour Kittiwake Colony CWS | 0.8                                                         | Breeding kittiwake.                                                                                                                                                                                          |
|                          | St Margaret's Churchyard CWS           | 1                                                           | Unimproved grassland.                                                                                                                                                                                        |
|                          | Parkhill Wood CWS                      | 1.4                                                         | Mature, mixed woodland.                                                                                                                                                                                      |
|                          | Whitehouse Farm Meadow CWS             | 1.6                                                         | A complex area consisting of a number of different plant communities.                                                                                                                                        |
|                          | Blundeston Prison Lake and Woods CWS   | 1.7                                                         | A lake that is surrounded by secondary woodland.                                                                                                                                                             |
|                          | Oulton Road Pond and Meadow CWS        | 1.8                                                         | Semi improved grassland, hedgerow, broad-leaved woodland, an area of dense scrub and a pond in the north which offer a range of habitats for a number of species.                                            |
| Proposed CSR             | Dew's Ponds SSSI                       | 1.3                                                         | The site supports one of the largest known breeding populations of great crested newts in the UK. There are 12 ponds within the site, ranging from long established to more recently established farm ponds. |
|                          | Kendall's Wood / Cats Covert CWS       | 0.5                                                         | Ancient woodland.                                                                                                                                                                                            |
|                          | Big Wood CWS                           | 1.1                                                         | A long-established woodland.                                                                                                                                                                                 |

| EIA Scoping Area Section | Designated Site                      | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                 |
|--------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Abbey Wood CWS                       | 1.4                                                         | Ancient woodland.                                                                                                                                                                                                                                                              |
|                          | Kingstall Wood CWS                   | 1.5                                                         | Ancient woodland.                                                                                                                                                                                                                                                              |
|                          | Heveningham Park Wet Grassland CWS   | 1.9                                                         | An area of wet meadow, which supports a good diversity of flowering plants.                                                                                                                                                                                                    |
| Proposed WSR             | Gypsy Camp Meadows, Thrandeston SSSI | 1                                                           | These wet meadows on poorly drained boulder clay have a rich variety of flora, and drainage ditches, areas of drier grassland and hedges add to the diversity. Plants include early purple orchid, ragged robin, zig-zag clover and water avens.                               |
|                          | Broome Field CWS                     | 0.0                                                         | A species-rich grassland site which contains a range of soil types from dry gravels to wet clay, supporting a diverse plant community such as agrimony, common centaury, fleabane, grass vetchling and imperforate St John's-wort as well as six difference species of orchid. |
|                          | Railway Meadows CWS                  | 0.9                                                         | A herb-rich community including a number of scarce Suffolk plants such as yellow rattle, ragged-robin, lesser spearwort and fen bedstraw.                                                                                                                                      |
|                          | Thrandeston Marsh CWS                | 0.9                                                         | An important wetland community including a number of wetland plants which are becoming increasingly scarce in Suffolk such as lesser spearwort, meadow-rue and meadow thistle.                                                                                                 |
|                          | Stuston Common CWS                   | 1.4                                                         | A range of plant communities, including calcareous grassland, acid grassland, and neutral grassland.                                                                                                                                                                           |



| EIA Scoping Area Section                | Designated Site                      | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                 |
|-----------------------------------------|--------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Mellis Common CWS                    | 1.4                                                         | Species rich grassland supporting quaking-grass, green-winged orchid and field wood-rush, ponds.                                                                                                                                               |
| Proposed AWRP to River Waveney Pipeline | Stanley and Alder Carrs, Aldeby SSSI | 0.2                                                         | Extensive area of regularly flooded alder carr woodland and fen.                                                                                                                                                                               |
|                                         | Geldeston Meadows SSSI               | 0.3                                                         | Exceptionally diverse example of the traditionally managed grazing meadows of the area.                                                                                                                                                        |
|                                         | Barnby Broad & Marshes SSSI          | 1.7                                                         | Open water, carr woodland, fen, grazing marsh and dykes (ditches).                                                                                                                                                                             |
|                                         | Gunton Warren and Corton Woods LNR   | 1.2                                                         | A range of habitats including: sand dunes, shingle, lowland heath and cliff slopes, mature trees.                                                                                                                                              |
|                                         | Gunton Woods LNR                     | 1.8                                                         | 4,000 new trees, paths, seats and a pond to provide a haven for wildlife and nature lovers.                                                                                                                                                    |
|                                         | River Waveney CWS                    | 0                                                           | Reedbed which is of high conservation value. This linear reedbed provides suitable nesting conditions for warblers, for example reed and sedge warblers and reed bunting. In winter it provides shelter for overwintering wildfowl and waders. |
|                                         | Meadows at Boon's Plantation CWS     | 0                                                           | Species rich marshy grassland.                                                                                                                                                                                                                 |
|                                         | Gillingham Wood & Thicks CWS         | 0.1                                                         | Ancient woodland.                                                                                                                                                                                                                              |
|                                         | Primrose Grove & Old Grove CWS       | 0.1                                                         | Broadleaved woodland.                                                                                                                                                                                                                          |

| EIA Scoping Area Section | Designated Site                        | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                          |
|--------------------------|----------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Great Wood CWS                         | 0.2                                                         | Coppice woodland.                                                                                                                                                                                                                       |
|                          | New Dyke and Shipmeadow Marshes CWS    | 0.3                                                         | Fish and dragonflies. The edges of the water course are colonised by a very good range of marginal plants.                                                                                                                              |
|                          | Wheatacre Marshes CWS                  | 0.4                                                         | Carr and marshy grassland.                                                                                                                                                                                                              |
|                          | Middle Row Wood CWS                    | 0.4                                                         | Ancient woodland.                                                                                                                                                                                                                       |
|                          | Blundeston Prison Lake and Woods CWS   | 0.4                                                         | As above.                                                                                                                                                                                                                               |
|                          | Somerleyton and Blundeston Marshes CWS | 0.5                                                         | The main wildlife interest lies in the system of drainage dykes. The dykes are species-rich and colonised with a range of common water plants but also provide a valuable refuge for a number of nationally rare and declining species. |
|                          | Flixton Decoy Meadows                  | 0.7                                                         | Wet meadow community which supports a good range of wetland plants for example, ragged robin, southern marsh orchid and common spike-rush.                                                                                              |
|                          | Stanley Hills CWS                      | 0.9                                                         | Habitats including acid grassland, bracken, and scattered scrub.                                                                                                                                                                        |
|                          | Geldeston Marshes CWS                  | 1.0                                                         | Grazing marsh and associated species.                                                                                                                                                                                                   |
|                          | Church Road RNR                        | 1.0                                                         | No data.                                                                                                                                                                                                                                |
|                          | Gillingham Roundabout                  | 1.1                                                         | No data.                                                                                                                                                                                                                                |

| EIA Scoping Area Section | Designated Site              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                       |
|--------------------------|------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|                          | Shell Garage RNR             |                                                             |                                                                                                                      |
|                          | Corton Woods CWS             | 1.1                                                         | As above.                                                                                                            |
|                          | RNR 173                      | 1.2                                                         | Chalk flora including three species of orchids.                                                                      |
|                          | Whitehouse Farm Meadow CWS   | 1.2                                                         | As above.                                                                                                            |
|                          | Station Road Meadow CWS      | 1.2                                                         | Marshy grassland crossed by wide dykes over fen peat soils.                                                          |
|                          | Boons Heath CWS              | 1.3                                                         | Bracken-dominated heath on sandy, gravelly soils.                                                                    |
|                          | Norwich Road (A146) RNR      | 1.3                                                         | No data.                                                                                                             |
|                          | Grassland at Aldeby Hall CWS | 1.4                                                         | No data.                                                                                                             |
|                          | Lound Lakes CWS              | 1.4                                                         | As above.                                                                                                            |
|                          | Carlton Marshes CWS          | 1.4                                                         | Tall fen, fen meadow, and coastal and floodplain grazing marsh with their associated dykes, reedbeds and alder carr. |
|                          | Beccles Marshes CWS          | 1.5                                                         | Fen, reedbeds, wet woodland and floodplain grazing marsh.                                                            |
|                          | Gunton Meadow CWS            | 1.6                                                         | As above.                                                                                                            |
|                          | Black's Grove CWS            | 1.7                                                         | Ancient woodland.                                                                                                    |
|                          | Gunton Pond CWS              | 1.7                                                         | As above.                                                                                                            |

| EIA Scoping Area Section             | Designated Site                                                | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                           |
|--------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | Raveningham Covert CWS                                         | 1.8                                                         | Ancient woodland.                                                                                                                                                                                                                        |
|                                      | Town Wood and Eight-Acre Plantation CWS                        | 1.8                                                         | Ancient, replanted woodland.                                                                                                                                                                                                             |
|                                      | Parkhill Wood CWS                                              | 1.8                                                         | As above.                                                                                                                                                                                                                                |
|                                      | Gunton Warren CWS                                              | 1.8                                                         | As above.                                                                                                                                                                                                                                |
|                                      | Herringfleet Marshes CWS                                       | 1.8                                                         | Unimproved pasture.                                                                                                                                                                                                                      |
|                                      | Foxburrow Wood CWS                                             | 1.9                                                         | As above.                                                                                                                                                                                                                                |
| Proposed Barsham WTW to CSR Pipeline | Dew's Ponds SSSI                                               | 1.3                                                         | The site supports one of the largest known breeding populations of great crested newts in the UK. There are 12 ponds within the site, ranging from long established to more recently established farm ponds.                             |
|                                      | RNR 141                                                        | 0.2                                                         | Boulder clay flora.                                                                                                                                                                                                                      |
|                                      | Long Meadow CWS                                                | 0.2                                                         | Unimproved lowland meadow and supports a species-rich plant community typical of boulder clay hay meadows including sneezewort and pepper saxifrage. Green-winged orchids have been recorded at the eastern end of the meadow.           |
|                                      | The Commons of Ilketshall St Andrew and Ilketshall St John CWS | 0.3                                                         | A mosaic of grassland, scrub, ponds and interconnecting hedgerows and verges of the Commons supports a diverse range of habitats and associated wildlife. Two of the Commons (Mill and Holden's), are unimproved species rich grassland. |

| EIA Scoping Area Section | Designated Site                 | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                        |
|--------------------------|---------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Great And Briery Woods CWS      | 0.5                                                         | Ancient Woodland.                                                                                                                                                                                                                                     |
|                          | St Lawrence Green Pond CWS      | 0.6                                                         | A large pond, and had records of fine-leaved water dropwort, an uncommon plant in Suffolk.                                                                                                                                                            |
|                          | Furze Common CWS                | 0.7                                                         | A mosaic of semi-natural woodland, scrub and rough grassland.                                                                                                                                                                                         |
|                          | New Reach River and Marsh CWS   | 0.9                                                         | This tributary, associated banks and adjacent wet meadow support a diverse range of wildlife.                                                                                                                                                         |
|                          | Kendall's Wood/ Cats Covert CWS | 1.0                                                         | Ancient woodland.                                                                                                                                                                                                                                     |
|                          | Birds Folly CWS                 | 1.1                                                         | A mosaic of habitat types, including secondary mature woodland, dense scrub, acid grassland and heath.                                                                                                                                                |
|                          | Halesworth Cemetery CWS         | 1.1                                                         | Species-rich grassland containing abundant and varied grass and wildflower species, with scattered trees and scrub.                                                                                                                                   |
|                          | Rectory Meadow Ponds CWS        | 1.2                                                         | Two ponds with a varied emergent and submerged flora including scarce and declining species orange foxtail, greater spearwort and bur-marigold as well as more common aquatic species such as celery-leaved buttercup, common fleabane and gypsywort. |
|                          | Kingstall Wood CWS              | 1.3                                                         | Ancient woodland.                                                                                                                                                                                                                                     |
|                          | Gorse Thick CWS                 | 1.3                                                         | Ancient woodland.                                                                                                                                                                                                                                     |

| EIA Scoping Area Section     | Designated Site                    | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                              |
|------------------------------|------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | Heveningham Park Wet Grassland CWS | 1.4                                                         | As above.                                                                                                                                                                   |
|                              | Big Wood CWS                       | 1.5                                                         | As above.                                                                                                                                                                   |
|                              | Abbey Wood CWS                     | 1.5                                                         | As above.                                                                                                                                                                   |
|                              | Fairview Farm Meadow CWS           | 1.5                                                         | Meadow supporting a diverse range of flora which varies across the site. Species associated with wetland plant communities such as hard rush and marsh woundwort.           |
|                              | Ilketshall John Wet Meadow CWS     | 1.7                                                         | Wet meadow habitat.                                                                                                                                                         |
|                              | Weston Crossing Meadow CWS         | 1.7                                                         | A sheltered mosaic of grassland and scrub of varying age and structure, making it ideal habitat for many grassland butterflies. It also supports slow-worm and grass snake. |
|                              | Sparrow's Thicks CWS               | 1.8                                                         | Broadleaved woodland.                                                                                                                                                       |
|                              | Rumburgh Wood CWS                  | 1.9                                                         | Ancient woodland.                                                                                                                                                           |
| Proposed CSR to WSR Pipeline | The Pennings, Eye LNR              | 1.4                                                         | Hay meadow. Fauna on the river bank include kingfishers and water voles.                                                                                                    |
|                              | Redlingfield Wood CWS              | 0.2                                                         | Ancient woodland.                                                                                                                                                           |
|                              | Horham Churchyard CWS              | 0.2                                                         | Species rich grassland.                                                                                                                                                     |

| EIA Scoping Area Section | Designated Site                 | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features |
|--------------------------|---------------------------------|-------------------------------------------------------------|--------------------------------|
|                          | Athelington Wood CWS            | 0.3                                                         | Ancient woodland.              |
|                          | Broome Field CWS                | 0.4                                                         | As above.                      |
|                          | Coldham Wood CWS                | 0.6                                                         | Coldham.                       |
|                          | Laxfield Wood CWS               | 0.6                                                         | Ancient woodland.              |
|                          | Old Rectory Meadow CWS          | 0.7                                                         | Species rich grassland.        |
|                          | Laxfield Cemetery CWS           | 0.8                                                         | Species rich grassland.        |
|                          | RNR 199                         | 0.8                                                         | Sulphur clover.                |
|                          | Laxfield Meadows CWS            | 0.9                                                         | Species rich grassland.        |
|                          | Ubbeston Wood CWS               | 0.9                                                         | Ancient woodland.              |
|                          | Kendall's Wood/ Cats Covert CWS | 1.0                                                         | Ancient woodland.              |
|                          | Gothic Farm Meadow CWS          | 1.1                                                         | Unimproved grassland.          |
|                          | Abbey Wood CWS                  | 1.2                                                         | As above.                      |
|                          | Big Wood CWS                    | 1.3                                                         | As above.                      |
|                          | RNR 193                         | 1.4                                                         | Sulphur clover.                |
|                          | Denham Churchyard CWS           | 1.5                                                         | Species rich grassland.        |

| EIA Scoping Area Section            | Designated Site                    | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                            |
|-------------------------------------|------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | Little Wood CWS                    | 1.5                                                         | Ancient woodland.                                                                                                                                                                                         |
|                                     | Stradbroke Cemetery CWS            | 1.5                                                         | Species rich grassland.                                                                                                                                                                                   |
|                                     | Stradbroke Meadow CWS              | 1.6                                                         | Unimproved grassland.                                                                                                                                                                                     |
|                                     | Heveningham Park Wet Grassland CWS | 1.7                                                         | As above.                                                                                                                                                                                                 |
|                                     | Stuston Common CWS                 | 1.7                                                         | As above.                                                                                                                                                                                                 |
|                                     | Grove Wood CWS                     | 1.9                                                         | Ancient woodland.                                                                                                                                                                                         |
| Proposed CSR to Saxmundham Pipeline | Dew's Ponds SSSI                   | 1.3                                                         | The site supports one of the largest known breeding populations of great crested newts in the UK. There are 12 ponds within the site, ranging from long established farm ponds to more recently dug ones. |
|                                     | Abbey Wood CWS                     | 0.0                                                         | As above.                                                                                                                                                                                                 |
|                                     | Big Wood CWS                       | 0.0                                                         | As above.                                                                                                                                                                                                 |
|                                     | Hencoop Wood CWS                   | 0.0                                                         | Ancient woodland.                                                                                                                                                                                         |
|                                     | RNR 121                            | 0.1                                                         | Sulphur clover and pyramidal orchids.                                                                                                                                                                     |
|                                     | Kendall's Wood/ Cats Covert CWS    | 0.2                                                         | Ancient woodland.                                                                                                                                                                                         |
|                                     | The Spring Wood CWS                | 0.2                                                         | Broadleaved woodland.                                                                                                                                                                                     |



| EIA Scoping Area Section | Designated Site                    | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                              |
|--------------------------|------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|                          | Lonely Wood CWS                    | 0.2                                                         | Ancient woodland.                                                                           |
|                          | RNR 187                            | 0.4                                                         | Sulphur clover.                                                                             |
|                          | Coe Wood CWS                       | 0.5                                                         | Ancient woodland.                                                                           |
|                          | Dodd's Wood CWS                    | 0.6                                                         | Ancient woodland.                                                                           |
|                          | Benhall Churchyard CWS             | 0.8                                                         | Unimproved grassland.                                                                       |
|                          | Peasenhall Cemetery CWS            | 0.8                                                         | Species rich grassland.                                                                     |
|                          | Hernsey Wood CWS                   | 0.8                                                         | Ancient woodland.                                                                           |
|                          | Benhall Green Meadows CWS          | 1.0                                                         | Flower rich marsh.                                                                          |
|                          | Bruisyard Wood CWS                 | 1.4                                                         | Ancient woodland.                                                                           |
|                          | Great Glemham Small Woods CWS      | 1.5                                                         | Ancient woodland.                                                                           |
|                          | RNR 216                            | 1.7                                                         | ████████████████████<br>████████████                                                        |
|                          | Manor Farm Meadows CWS             | 1.8                                                         | Small wet meadows supporting a good wet grassland flora typical of lowland grazing meadows. |
|                          | Kingstall Wood CWS                 | 1.9                                                         | Ancient woodland.                                                                           |
|                          | Heveningham Park Wet Grassland CWS | 1.9                                                         | As above.                                                                                   |

| EIA Scoping Area Section            | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                     |
|-------------------------------------|----------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed Saxmundham to SZC Pipeline | Sizewell Marshes SSSI                        | Adjacent                                                    | Large area of lowland, unimproved wet meadows which support outstanding assemblages of invertebrates and breeding birds. Several nationally scarce plants are also present.                                                                                                        |
|                                     | Minsmere-Walberswick Heaths and Marshes SSSI | Adjacent                                                    | A complex series of habitats, notably mudflats, shingle beach, reedbeds, heathland and grazing marsh, which combine to create an area of exceptional scientific interest.                                                                                                          |
|                                     | Sizewell Levels and Associated Areas CWS     | 0.0                                                         | Woodland, plantation, wet meadow, osier beds and scrub. The main importance of the grazing marshes lies in the diversity and abundance of the birds which inhabit the area.                                                                                                        |
|                                     | Leiston Airfield CWS                         | 0.0                                                         | A mosaic of species-rich grassland and scrub.                                                                                                                                                                                                                                      |
|                                     | Theberton Woods CWS                          | 0.0                                                         | Semi-natural boulder clay woodland that supports a diverse woodland flora including butterfly and bird's nest orchids.                                                                                                                                                             |
|                                     | Kelsale Morio Meadow CWS                     | 0.1                                                         | No data.                                                                                                                                                                                                                                                                           |
|                                     | Southern Minsmere Levels CWS                 | 0.1                                                         | The entire valley is of great importance for wildlife forming perhaps the last unspoilt and least improved of Suffolk's larger marshland river valleys. This eastern portion of the valley is of interest principally for breeding wader and wildfowl and for overwintering birds. |
|                                     | RNR 187                                      | 0.2                                                         | Sulphur Clover.                                                                                                                                                                                                                                                                    |

| EIA Scoping Area Section            | Designated Site                                   | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                  |
|-------------------------------------|---------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | Suffolk Shingle Beaches CWS                       | 0.2                                                         | Vegetated shingle.                                                                                                                                                              |
|                                     | Tiggins Lane, RNR 209                             | 0.4                                                         | Boulder clay flora including Sulphur Clover, Yellow Rattle, Field Scabious, Sneezewort, Pepper Saxifrage, Wild Basil, Red Bartsia, Cowslips, False Oxlip, Ramsons and Primrose. |
|                                     | RNR 216                                           | 0.4                                                         | As above.                                                                                                                                                                       |
|                                     | Kiln Grove & Meadow CWS                           | 0.5                                                         | Ancient woodland.                                                                                                                                                               |
|                                     | Minsmere Valley Eastbridge to Reckford Bridge CWS | 0.5                                                         | Herb rich, unimproved marshes.                                                                                                                                                  |
|                                     | Lonely Wood CWS                                   | 0.7                                                         | As above.                                                                                                                                                                       |
|                                     | Leiston Common CWS                                | 0.9                                                         | Lowland acid grassland and lowland heathland.                                                                                                                                   |
|                                     | Coe Wood CWS                                      | 1.2                                                         | As above.                                                                                                                                                                       |
|                                     | RNR 102                                           | 1.3                                                         | Sulphur Clover & Dyer's Greenwood.                                                                                                                                              |
|                                     | Sizewell Rigs CWS                                 | 1.4                                                         | Breeding colony of kittiwakes.                                                                                                                                                  |
|                                     | Buckle's Wood CWS                                 | 1.4                                                         | Coppice woodland.                                                                                                                                                               |
|                                     | Hernsey Wood CWS                                  | 1.8                                                         | As above.                                                                                                                                                                       |
| Proposed Eastern Distribution Mains | Gypsy Camp Meadows, Thrandeston SSSI              | 0.8                                                         | These wet meadows on poorly drained boulder clay have a rich variety of flora, and drainage ditches, areas of drier grassland                                                   |

| EIA Scoping Area Section            | Designated Site              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                     |
|-------------------------------------|------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|                                     |                              |                                                             | and hedges add to the diversity. Plants include early purple orchid, ragged robin, zig-zag clover and water avens. |
|                                     | Major Farm, Braiseworth SSSI | 1.5                                                         | Damp and species-rich unimproved hay meadow.                                                                       |
|                                     | Mellis Common CWS            | 0.0                                                         | As above.                                                                                                          |
|                                     | Broome Field CWS             | 0.0                                                         | As above.                                                                                                          |
|                                     | Thornham Estate Woods CWS    | 0.8                                                         | Ancient woodland.                                                                                                  |
|                                     | Railway Meadows CWS          | 0.9                                                         | As above.                                                                                                          |
|                                     | Thrandeston Marsh CWS        | 0.9                                                         | As above.                                                                                                          |
|                                     | Thornham Parva Meadow CWS    | 1.2                                                         | Unimproved species-rich grassland.                                                                                 |
|                                     | Stuston Common CWS           | 1.4                                                         | As above.                                                                                                          |
| Proposed Western Distribution Mains | RNR 212                      | 0.0                                                         | Sulphur Clover, Pyramidal Orchid, Bee Orchid.                                                                      |
|                                     | RNR 211                      | 0.1                                                         | Sulphur Clover, Pyramidal Orchid, Bee Orchid.                                                                      |
|                                     | Topcroft Farm Meadows CWS    | 0.7                                                         | Herb-rich grassland.                                                                                               |
|                                     | Thornham Estate Woods CWS    | 0.8                                                         | As above.                                                                                                          |

| EIA Scoping Area Section | Designated Site     | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features     |
|--------------------------|---------------------|-------------------------------------------------------------|------------------------------------|
|                          | Westhorpe Green CWS | 1.3                                                         | Unimproved species-rich grassland. |

### Priority and Irreplaceable Habitats

6.4.8 Table 6-5 provides a summary of priority and irreplaceable habitats within 500m of each section of the EIA Scoping Area that have been identified from desk-based study data. These are shown on Figure 6-3.

Table 6-5: Summary of Priority and Irreplaceable Habitats within 500m of each EIA Scoping Area Section

| EIA Scoping Area Section                | Summary of Priority and Irreplaceable Habitats                                                                                                                                                                                                                                    |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed AWRP                           | Deciduous woodland, purple moor grass and rush pastures, ancient/veteran trees.                                                                                                                                                                                                   |
| Proposed LSO                            | Deciduous woodland, ancient woodland, coastal sand dunes, lowland heathland, maritime cliff and slope, traditional orchard, purple moor grass and rush pastures, good quality semi-improved grassland, ancient/veteran trees.                                                     |
| Proposed CSR                            | Deciduous woodland, ancient woodland, ponds, ancient/veteran trees.                                                                                                                                                                                                               |
| Proposed WSR                            | Deciduous woodland, wood pasture and parkland, traditional orchard, lowland meadows, ancient/veteran trees.                                                                                                                                                                       |
| Proposed AWRP to River Waveney Pipeline | Deciduous woodland, ancient woodland, coastal and floodplain grazing marsh, lowland fen, ponds, reedbeds, good quality semi-improved grassland, traditional orchard, purple moor grass and rush pastures, lowland dry acid grassland, open mosaic habitat, ancient/veteran trees. |

| EIA Scoping Area Section             | Summary of Priority and Irreplaceable Habitats                                                                                                                                                                                                                                 |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed Barsham WTW to CSR Pipeline | Deciduous woodland, ancient woodland, wood pasture and parkland, coastal and floodplain grazing marsh, ponds, good quality semi-improved grassland, traditional orchard, ancient/veteran trees.                                                                                |
| Proposed CSR to WSR Pipeline         | Deciduous woodland, ancient woodland, wood pasture and parkland, coastal and floodplain grazing marsh, ponds, traditional orchard, ancient/veteran trees.                                                                                                                      |
| Proposed CSR to Saxmundham Pipeline  | Deciduous woodland, ancient woodland, wood pasture and parkland, coastal and floodplain grazing marsh, traditional orchard, ancient/veteran trees.                                                                                                                             |
| Proposed Saxmundham to SZC Pipeline  | Deciduous woodland, ancient woodland, wood pasture and parkland, coastal and floodplain grazing marsh, traditional orchard, lowland fen, ponds, lowland heathland, coastal sand dunes, good quality semi-improved grassland, coastal vegetated shingle, ancient/veteran trees. |
| Proposed Eastern Distribution Mains  | Deciduous woodland, wood pasture and parkland, lowland meadows, traditional orchard, good quality semi-improved grassland, ancient/veteran trees.                                                                                                                              |
| Proposed Western Distribution Mains  | Deciduous woodland, ancient/veteran trees.                                                                                                                                                                                                                                     |

## Habitats

- 6.4.9 This Section provides a summary of the habitat types identified within the EIA Scoping Area, based on current information. Habitats have been classified in accordance with the UKHAB [11].
- 6.4.10 Information on habitats has been obtained using satellite imagery from the last growing season in 2025 (~30cm resolution), which was then analysed using an artificial intelligence ('AI') tool to define habitat parcels, linear features and waterbodies and assign habitat types. Using this method has enabled habitat data to be collected early in the EIA process, allowing the Applicant to use this to inform the early stages of the emerging design of the Proposed Development, inform field surveying, and consider BNG. Chapter 3 EIA methodology of this Scoping Report states how the ES and

DCO application will summarise how the use of this data complies with guidance from the Planning Inspectorate [12] on the use of AI tools.

- 6.4.11 The data obtained from the AI tool covered the emerging EIA Scoping Area, which was the most current boundary available at that time. Subsequently, the design of the Proposed Development has evolved, and some additional areas have been included within the EIA Scoping Area. Habitat data for these additional areas is being collected during field surveys in 2026 and 2027, and a complete dataset will be available to inform the ES and BNG assessment to be submitted in support of the DCO application.
- 6.4.12 To ensure robustness and for the purposes of validation, the AI tool's data is being 'ground truthed' during field surveys being undertaken in 2026 and 2027. During field surveys, the broad habitat types are verified, and more detailed information on the habitat is collected such as species lists or other contextual information. Where relevant, the condition of each habitat parcel is assessed using Statutory Biodiversity Metric Condition Assessment Sheets [13].
- 6.4.13 Habitat data presented within the ES and used to inform the final assessment will have been through this verification process.
- 6.4.14 Table 6-6 provides a summary of the habitat types within each EIA Scoping Area section using UKHab data procured from the AI tool, where this is available for the EIA Scoping Area.

Table 6-6: Summary of UKHab Data (AI Tool) within each EIA Scoping Area Section

| EIA Scoping Area Section | Summary of Main Habitats                                                                                                                                               |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed AWRP            | Predominantly farmland with cereal crops or grass/clover leys. Broadleaved woodland, scrub, trees, and hedgerows are present within the landscape.                     |
| Proposed LSO             | Predominantly farmland with cereal crops or grass/clover leys, modified grassland. Broadleaved woodland, scrub, trees, and hedgerows are present within the landscape. |

| EIA Scoping Area Section                | Summary of Main Habitats                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Coastal and intertidal habitats present within this area include maritime cliffs and slopes and littoral coarse sediment.                                                                                                                                                                                                                                                                                                               |
| Proposed CSR                            | Predominantly farmland with cereal crops. Broadleaved woodland, ponds, scrub, trees and hedgerows are present within the landscape.                                                                                                                                                                                                                                                                                                     |
| Proposed WSR                            | Predominantly farmland with cereal crops, modified grassland, and arable field margins. Broadleaved woodland, ponds, scrub, trees, hedgerows, and other rivers and streams are present within the landscape.                                                                                                                                                                                                                            |
| Proposed AWRP to River Waveney Pipeline | Predominantly farmland with cereal crops, non-cereal crops, temporary grass and clover leys, other neutral grassland, modified grassland, acidic grassland, and arable field margins. Broadleaved woodland, ponds, scrub, trees, hedgerows, and other rivers and streams are present within the landscape.<br>The River Waveney floodplain contains coastal floodplain grazing marsh, fen, ponds, other rivers and streams and ditches. |
| Proposed Barsham WTW to CSR Pipeline    | Predominantly farmland with cereal crops, temporary grass and clover leys, other neutral grassland, modified grassland, and arable field margins. Broadleaved woodland, ponds, scrub, trees, and hedgerows are present within the landscape.<br>The River Blythe floodplain contains coastal floodplain grazing marsh, ponds, other rivers and streams, and ditches.                                                                    |
| Proposed CSR to WSR Pipeline            | Predominantly farmland with cereal crops, non-cereal crops, temporary grass and clover leys, other neutral grassland, modified grassland, horticulture, and arable field margins. Broadleaved woodland, ponds, scrub, trees, ditches and hedgerows are present within the landscape.<br>The River Dove floodplain contains coastal floodplain grazing marsh, other rivers and streams.                                                  |
| Proposed CSR to Saxmundham Pipeline     | Predominantly farmland with cereal crops, non-cereal crops, temporary grass and clover leys, other neutral grassland, modified grassland, and arable field margins. Broadleaved woodland, ponds, scrub, trees, ditches and hedgerows are present within the landscape.<br>The River Yox floodplain contains coastal floodplain grazing marsh, and other rivers and streams.                                                             |



| EIA Scoping Area Section            | Summary of Main Habitats                                                                                                                                                                                                                                                     |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed Saxmundham to SZC Pipeline | Predominantly farmland with cereal crops, temporary grass and clover leys, other neutral grassland, modified grassland, and arable field margins. Woodland, wood-pasture and parkland, ponds, scrub, trees, ditches and hedgerows are present within the landscape.          |
| Proposed Eastern Distribution Mains | Predominantly farmland with cereal crops, temporary grass and clover leys, other neutral grassland, modified grassland, and arable field margins. Woodland, orchards, ponds, scrub, trees, other rivers and streams, ditches and hedgerows are present within the landscape. |
| Proposed Western Distribution Mains | Predominantly farmland with cereal crops, other neutral grassland, modified grassland, and arable field margins. Woodland, scrub, trees, and hedgerows are present within the landscape.                                                                                     |

## Species

- 6.4.15 Surveys for wintering birds have been undertaken between October 2025 and March 2026 inclusive. A summary of the results is presented below, and full survey results will be presented in the ES. Other species-specific surveys are being undertaken during relevant seasonal periods in 2026 and 2027. The ES will include the results of these surveys and the supporting justification of the approach used for each survey type.
- 6.4.16 The assessment of the nature conservation importance of all terrestrial biodiversity receptors will be informed by the ongoing surveys and will be provided and justified in the ES. The methodology for evaluation will follow the CIEEM Guidelines, with the importance of each ecological feature being determined against a geographical context (refer to Section 6.8 below).

## Wintering Birds

- 6.4.17 As set out within the Wintering Bird Survey Scope 2025/2026 (Appendix 6.3), the wintering bird survey area included land where the emerging EIA Scoping Area [14] was within 5km of an SPA or Ramsar site designated for birds. This resulted in two separate survey areas:

- A 'northern' survey area which covered much of the proposed AWRP to River Waveney Pipeline route (within 5km of Broadlands SPA/Ramsar and Breydon Water SPA/Ramsar).
- A 'southern' survey area which covered the eastern part of the Saxmundham to SZC Pipeline route (within 5km of Minsmere SPA/Ramsar, Sandlings SPA, Alde Ore SPA/Ramsar).

6.4.18 Areas over 5km from an SPA or Ramsar site designated for birds were not included within the wintering bird survey area.

6.4.19 Surveys of the northern survey area recorded a range of target species, including qualifying species of the nearby SPA/Ramsar sites and schedule 1 raptors. Most birds were recorded using the grazing marsh habitats adjacent to the River Waveney, which supported regular flocks of pink-footed geese, white-fronted geese, bean geese, redshank, golden plover, and lapwing. Other species recorded included bearded tits, marsh harrier, peregrine, and red kites. In other parts of the northern survey area, away from the Waveney Valley, fewer target species were recorded, other than occasional flocks of golden plover and lapwing within stubble fields, and the occasional marsh harrier.

6.4.20 Surveys of the southern survey area recorded only one target species, lapwing, with occasional flocks recorded roosting in arable fields.

## 6.5 Likely Significant Effects

6.5.1 The Proposed Development has the potential for a range of impacts on important biodiversity features. As set out in the CIEEM Guidelines, impacts can be either direct or indirect:

- A direct impact is considered to be a direct/immediate consequence of the Proposed Development, or particular activity, without any intervening steps. In this instance, this is a physical loss or gain of a habitat, or direct mortality/damage of an individual, or species population.
- An indirect impact is considered to be an impact on one individual, population, or habitat arising from an impact on an intermediary or as a result of an impact pathway.

6.5.2 Potential impact pathways from the Proposed Development which have been identified at this scoping stage include:

- Habitat loss (e.g. a section of hedgerow being removed), or habitat gain (e.g. creation of new hedgerow as part of the landscaping design for the Proposed Development [15]).
- Habitat degradation (e.g. through pollution, disturbance or changes to hydrology).
- Fragmentation of populations or habitats (e.g. fragmentation of bat population through removal of commuting habitat).
- Disturbance and/or displacement of species (e.g. birds displaced from a habitat due to noise and visual disturbance).
- Species injury or mortality (e.g. through collision with construction vehicles).

6.5.3 Whether an impact pathway has a potential to result in a likely significant effect will depend upon a range of factors, such as:

- The nature and scale of the Proposed Development.
- The proximity to the biodiversity feature.
- The sensitivity of the biodiversity feature.

6.5.4 Impacts may be either permanent (e.g. loss of a habitat during construction of permanent infrastructure), or temporary. Temporary impacts may be either:

- Short-term e.g. associated with temporary construction activities.
- Medium-term e.g. loss of a hedgerow which is subsequently reinstated.
- Long-term e.g. where operational activities or persistent environmental changes alter habitat conditions or species assemblages.

6.5.5 Taking into account the impact pathways described above, the likely significant effects that may occur during the construction, operational and decommissioning phases of the Proposed Development, in the absence of mitigation, are set out in the sections below.

### Construction Phase

6.5.6 In the context of the impact pathways described in paragraph 6.5.2, the following likely significant effects on terrestrial biodiversity receptors have been identified during construction:

- Direct and indirect impacts on designated sites and/or their interest features (including international sites, SSSIs and non-statutory sites) through loss of, or damage to, habitats, increase in deposition of pollutants (e.g. from vehicles), changes to hydrology, and disturbance of qualifying species.
- Indirect impacts on international sites and/or their interest features through disturbance and/or displacement of qualifying species.
- Indirect impacts on international sites and/or their interest features through loss of, or damage to, habitats which provide a supporting function (FLL [16]).
- Permanent and temporary terrestrial habitat loss, including coastal and intertidal habitats up to MHWS.
- Degradation of, or disturbance to, terrestrial habitats, including coastal and intertidal habitats up to MHWS, from construction activities including, but not limited to, site clearance, excavation, surface or groundwater pollution, and dust.
- Displacement, species loss and isolation through fragmentation (e.g. to foraging and commuting bats).
- Direct injury or mortality of wildlife during site clearance and construction.
- Disturbance of wildlife from construction activities including visual, noise, vibration and lighting.
- Spread of INNS.

## Operational Phase

6.5.7 In the context of the impact pathways described in paragraph 6.5.2, the following potential likely significant effects on terrestrial biodiversity receptors have been identified during operation:

- Direct and indirect impacts on designated sites (including international sites, SSSIs and non-statutory designated sites) through:
  - An increase in deposition of pollutants (e.g. from vehicles).
  - Changes to hydrology (e.g. through severance of existing hydrological pathways, changes to flows on the River Waveney, or through creation of new hydrological pathways).
  - Disturbance of qualifying species from operational activities which may generate noise or visual stimuli or impacts on habitats which provide a supporting function.

- Direct disturbance to species from visual stimuli, noise, vibration and lighting.
- Changes in hydrological regimes of watercourses and surface or ground water drainage during operation affecting habitats and supporting floral and faunal species.
- Spread of INNS between terrestrial habitats during routine maintenance or washouts [17].

### Decommissioning Phase

6.5.8 Decommissioning for the Proposed Development is anticipated for infrastructure to either be left in situ or involve the removal of above-ground infrastructure components (including the proposed AWRP, CSR and WSR). The underground infrastructure including pipeline components and the LSO (Option 1) are anticipated to be left in situ but could potentially be removed. Effects on terrestrial biodiversity receptors are anticipated to be similar in nature to those during construction, although potentially of reduced magnitude if pipelines are left permanently in-situ following decommissioning.

6.5.9 In the context of the impact pathways described in paragraph 6.5.2, the following likely significant effects have been identified during decommissioning:

- Direct and indirect impacts on designated sites (including international sites, SSSIs and non-statutory designated sites) through loss or damage to habitats, increase in deposition of pollutants (e.g. from vehicles), changes to hydrology, or disturbance of qualifying species.
- Indirect impacts to international sites through loss or damage to habitats which provide a supporting function (FLL).
- Temporary habitat loss, damage or disturbance to habitats from decommissioning activities.
- Displacement, species loss and isolation through fragmentation.
- Direct mortality of wildlife.
- Disturbance of wildlife including visual stimuli, noise, vibration and lighting.
- Spread of INNS.

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## 6.6 Impacts Scoped Out of the Assessment

- 6.6.1 Potential impacts are proposed to be scoped out of the assessment where there is no realistic impact pathway linking activities from the Proposed Development to terrestrial biodiversity receptors, or where effects would clearly be negligible.
- 6.6.2 The following potential impacts are proposed to be scoped out of the assessment in the ES:
- Pre-construction ecological mitigation (including advanced planting or the erection of temporary barriers to protect ecological interests) (as identified in chapter 3 EIA methodology).
  - Biodiversity surveys and monitoring, including site walkovers, habitat surveys, and species-specific surveys (as identified in chapter 3 EIA methodology).
  - Potential impacts on terrestrial biodiversity receptors beyond the specified study areas. The study areas have been developed to identify terrestrial biodiversity receptors that may be directly, or indirectly, affected by the Proposed Development. These allow for all identified indirect impact pathways such as effects from air quality or impacts to FLL and have been extended where hydrological pathways occur, e.g. receptors in the immediate vicinity of the River Waveney. As such, beyond the study areas, any potential impacts are unlikely to be significant.
  - Potential impacts on designated sites located further than 2km from the EIA Scoping Area where no impact pathways are evident (such as mobile qualifying species (as identified on the relevant citation), hydrological connectivity (to be confirmed through hydrological assessment), or air quality (to be confirmed through air quality assessment/modelling)). Whilst these sites may be sensitive, due to the spatial separation and/or absence of impact pathways, there would be no mechanism for effects from the Proposed Development.
  - Potential impacts on statutory designated sites located beyond 5km from the EIA Scoping Area which are designated for bird species or bird assemblages, unless available data indicate that use by qualifying species is likely within, or in the vicinity of, the EIA Scoping Area. The 5km wintering bird survey area was based on NE's SSSI Risk Impact Zones [18] to identify areas that could potentially be functionally linked to nearby sites designated for birds. Whilst these sites may be sensitive, for those located over 5km from the EIA Scoping Area, due to the spatial separation and/or absence of impact pathways, there would be no potential for effects [19]. Details of the designated sites (and the qualifying bird species) which have been identified within 5km are

identified within the Wintering Bird Survey Scope 2025/2026 (Appendix 6.3).

- Potential impacts on terrestrial biodiversity receptors which are not considered to be ‘important ecological features’ [20], [21]. In order to determine the likelihood of a significant ecological effect, the ES will identify whether a terrestrial biodiversity receptor is sufficiently important for a significant effect upon it to be material in decision-making. This assessment will follow the CIEEM Guidelines and will value the importance of terrestrial biodiversity receptors with reference to a geographical framework.
- Impacts on coastal and intertidal habitats during the Proposed Development’s operational phase are proposed to be scoped out of the assessment in the ES. Options for disposal of the concentrated residual water generated by the Proposed Development include a new LSO (Option 1), which would use horizontal directional drilling (‘HDD’) to install a pipe which would pass beneath the coastal cliffs within the EIA Scoping Area, avoiding any direct impacts on coastal and intertidal habitats. Other options for the LSO component involve connections to existing infrastructure on land, which would then convey effluent offshore. As such, there would be no operational impacts on coastal and intertidal habitats.

6.6.3 The Planning Inspectorate’s Nationally Significant Infrastructure Projects (‘NSIPs’): Pre-Application Advice on Environmental Impact Assessment (July 2026) [22]. For each potential impact scoped out, the supporting justification for proposing to scope out an assessment of the impacts in paragraph 6.6.2 from the ES has been based on the consideration of:

- The absence of realistic impact pathways.
- The sensitivity and conservation importance of receptors.
- The geographic scale of potential effects.
- The potential for cumulative impacts.

6.6.4 Where uncertainty exists regarding potential impact pathways or receptor sensitivity, impacts have been proposed to be scoped into the assessment in the ES on a precautionary basis. Further additional ecological receptors, or impact pathways, may be scoped out of assessment in the ES for some or all of the Proposed Development’s components as survey data is collected and the understanding of impacts from the Proposed Development is developed, such that the assessment will only include



potential impacts that could result in likely significant effects on terrestrial biodiversity.

- 6.6.5 Irreplaceable habitats within the study area for notable habitats will not be scoped out under any circumstances.

## 6.7 Proposed Approach to Mitigation

- 6.7.1 A hierarchical approach to mitigation is being adopted through the design process which seeks to avoid adverse impacts in the first instance through an iterative approach to the emerging design of the Proposed Development, e.g. avoiding the inclusion of sensitive terrestrial biodiversity receptors within the Order Limits, where possible. In areas where avoidance is not possible, measures will be proposed to prevent or reduce potentially significant negative effects. Measures to compensate negative effects may also be required, e.g. habitat creation to offset impacts associated with habitat loss and fragmentation, where these cannot be avoided. This approach is cognisant of the mitigation hierarchy considerations under the National Policy Statement for Water Resources Infrastructure (2023) [23] ('NPSWRI') and the need to also consider and demonstrate consideration of the mitigation hierarchy with respect to the anticipated mandatory requirement for the Proposed Development to deliver BNG.
- 6.7.2 It is important to note that outline mitigation measures described below should be treated as preliminary and will be reviewed and developed as the design evolves and further survey data is available. A preliminary summary of mitigation measures is provided below.
- 6.7.3 Primary, secondary and tertiary mitigation relevant to terrestrial biodiversity effects would include, but are not limited to, the following measures.

### Primary (Inherent) Mitigation

- Avoidance of high value terrestrial biodiversity receptors, such as designated sites and notable habitats, within the Order Limits.
- Use of trenchless crossing techniques (e.g. HDD) to avoid sensitive habitats such as rivers, where possible.



- Where there are areas of permanent land take (such as the proposed AWRP, CSR and WSR components of the Proposed Development), design and provision of an ecologically informed landscape design. Design to include habitats of ecological value which are relevant to and support the terrestrial biodiversity priorities of the local area. Local priorities would seek to be established through engagement and consultation with local stakeholders such as Local Planning Authorities, and the use of LNRs [24], [25].
- Sustainable Drainage Systems ('SuDS') for surface water management.
- Potential impacts on coastal and intertidal habitats have been considered in the emerging design for the LSO component of the Proposed Development. Mitigation for Option 1 in the emerging design includes a 200m set back from the current cliff tops, and which models the LSO up to 2133 (assuming an approximate 100-year design life). Option 2 and Option 3 utilise existing infrastructure which would avoid impacts to coastal and intertidal habitats.

### Secondary (Foreseeable) Mitigation

- Habitat creation within the Order Limits. This may be supported by the production of management and monitoring plans covering all phases of the Proposed Development.
- Implementation of ecologically informed management plans, including:
  - Outline Construction Environmental Management Plan ('OCEMP').
  - Outline Landscape and Environmental Management Plan ('OLEMP').
  - Outline Decommissioning Environmental Management Plan ('ODEMP').
- Lighting sensitively designed to avoid, or minimise illumination of sensitive terrestrial biodiversity receptors, such as habitats that support commuting and foraging bats. The lighting strategy will have regard to industry guidance and be developed in consultation with a suitably qualified ecologist.
- Provision of temporary habitat linkages for wildlife during construction.
- Where possible, construction activities programmed to avoid sensitive periods for fauna such as breeding birds, wintering birds, dormice, roosting bats and badgers.

### Tertiary (Inexorable) Mitigation

- Pollution prevention guidelines and standard construction best practices, such as use of spill kits and silt fencing.
- Compliance with protected species legislation and licensing requirements, including delivery of mitigation measures such as

translocation and/or habitat creation/enhancement, where appropriate for the particular species.

- Implementation of INNS Biosecurity Protocol.
- Environmental monitoring and incident response procedures.

## 6.8 Proposed Approach to the ES

### Best Practice Guidance

6.8.1 The assessment of effects on terrestrial biodiversity receptors will follow the standard industry approach as set out in the CIEEM Guidelines.

6.8.2 The use of the CIEEM Guidelines diverges from the more general EIA approach set out in chapter 3 EIA methodology, although it is acknowledged in paragraph 3.3.28 of chapter 3 that some disciplines may use different methodology. The CIEEM Guidelines are considered the industry standard for biodiversity and as such has been adopted for the assessment of effects on terrestrial biodiversity receptors.

### Assessment Methodology

6.8.3 This section sets out the proposed methodology for the assessment of likely significant effects on terrestrial biodiversity in the ES. This is based on professional judgement and previous experience, together with guidance outlined above. The assessment will be undertaken in accordance with the CIEEM Guidelines.

6.8.4 Baseline conditions will be established through an ongoing desk-based study and field surveys undertaken between 2025 and 2027, as set out in Section 6.4 above.

6.8.5 The ES will present an assessment of likely significant effects on important ecological features, and as such, does not require consideration of effects on every species or habitat that may be present. To determine whether there are likely to be significant effects, it is first necessary to identify whether an ecological feature is 'important', and therefore whether an effect upon it could be significant, and thus, material in decision-making.

- 6.8.6 The terrestrial biodiversity chapter of the ES will assess effects on important ecological features with regard to the positive (beneficial) or negative (adverse) nature, extent, magnitude, duration, timing, frequency, and reversibility of the impacts. For each ecological feature identified as being important, relevant impacts will be characterised, effects defined (in light of any primary or tertiary ecological mitigation) and their significance assessed, secondary mitigation identified (where required) and residual effects will also be reported.
- 6.8.7 The terms 'impact' and 'effect' are often used synonymously, and this can lead to confusion. For the purposes of the terrestrial biodiversity chapter of the ES, they will be defined as follows, in accordance with the CIEEM Guidelines:
- Impacts: Actions resulting in changes to an ecological feature. For example, the construction activities removing a hedgerow.
  - Effects: Outcome to an ecological feature from an impact. For example, the effects on a breeding bird population from a loss of a hedgerow.

### Sensitivity of Receptors

- 6.8.8 The importance of each ecological feature within the study areas will be determined having regard to a number of contributory factors relating to conservation value. The CIEEM Guidelines recognise that determining importance is a complex process, which is a matter of professional judgement guided by a number of factors. These include designation and legislative protection as well as biodiversity value, potential value and secondary/supporting value (e.g. rarity, scarcity, function within ecosystem, population trends). Consideration of each ecological feature having regard to these factors allows their importance to be determined, with reference to the geographic context set out in Table 6-7 below.

Table 6-7: Levels of Ecological Importance and Description/Rationale

| Ecological Importance                   | Description/ Rationale                                                                                                                                                                                    |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| International (European or Worldwide)   | The highest level of importance assigned to features which may be designated at an international level (such as SACs or SPAs), or internationally important habitats, species, or assemblages of species. |
| National (England)                      | Assigned to features which may be designated at a national level (such as SSSIs), or nationally important habitats, species, or assemblages of species.                                                   |
| Regional (East of England)              | Features which are considered to be important at a regional level, for instance an important assemblage of bats.                                                                                          |
| County (Suffolk or Norfolk)             | Features which may be designated at a county level (such as a CWS), or habitats, species, or assemblages of species considered to be of importance at a county level.                                     |
| Local (within the local authority area) | Features which do not meet the threshold for county importance but which are considered to be important at a local level, such as a small area of woodland, or a population of scarce species.            |
| Less than Local                         | Habitats, species, or assemblages of species which are common or widespread in the area.                                                                                                                  |

6.8.9 For the purposes of the assessment, any ecological feature of local importance or above will be considered an ‘important ecological feature’ and taken forward for assessment. Features of less than local importance will not be considered ‘important ecological features’ and will be scoped out of any further assessment. Where protected species (of ‘less than local’ importance) are nonetheless present, measures to enable compliance with relevant wildlife legislation and policy will also be considered in the terrestrial biodiversity chapter of the ES.

### Impact Magnitude

6.8.10 The magnitude of an impact reflects the degree of change to an ecological receptor caused by the Proposed Development, independent of its importance or sensitivity. Magnitude is assessed on a scale ranging from very low to high, see Table 6-8.

Table 6-8: Impact Magnitude Criteria for Terrestrial Biodiversity Receptors

| Magnitude | Definition                                                                                                                                                                                                                       |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High      | Total loss or major/substantial alteration to key elements/features of the baseline conditions such that the post development character/composition/attributes will be fundamentally changed.                                    |
| Medium    | Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.                                       |
| Low       | A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes will be similar to the baseline condition. |
| Very Low  | Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.                                                                                                            |

- 6.8.11 Magnitude will be determined through a quantified approach as far as possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.

### Effect Significance

- 6.8.12 The nature and extent of the impacts of the Proposed Development will be informed by other assessments reported within and undertaken to support the ES, as required (such as in respect of noise, hydrology and air quality). The predicted impacts may be direct or indirect in nature and may occur in the construction, operational, or decommissioning phases of the Proposed Development. The determination and description of the significance of the predicted ecological effects will be undertaken in accordance with the CIEEM Guidelines along with professional judgement. When considering the likely significant effects, the following characteristics will be considered:
- The positive (beneficial) or negative (adverse) nature.
  - Extent.
  - Magnitude.
  - Duration.
  - Frequency and timing.

- 
- Reversibility of the impacts assessed.
- 6.8.13 The assessment may also be informed by conservation objectives for the affected feature, where available (for example conservation objectives for international sites, or in habitat and species action plans). The ‘conservation status’ or the degree to which a feature is exhibiting ‘integrity’ in terms of structure, function and condition will also be considered.
- 6.8.14 These factors provide a means of characterising the impacts of the Proposed Development and thereby support an assessment of the significance of the effects on the important ecological features determined as relevant in this assessment. The CIEEM Guidelines encourage the expression of significance of ecological effects with reference to the geographic frame of reference, as described above. The CIEEM Guidelines state that an effect should be determined as being significant in ecological terms when it *‘either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general’*. Significance is a concept related to the weight that should be afforded to effects when decisions are made, and to the consequences, in terms of legislation, policy and/or development control. Therefore, a significant negative (adverse) effect on a feature of importance at one level would be likely to trigger related planning policies and, if permissible at all, generate the need for development control mechanisms, such as planning conditions or legal obligations, as described in those policies.
- 6.8.15 An effect on an important ecological feature may be significant at the same geographic scale at which the feature is determined to be important, or at a lesser geographical scale, depending on the characterisation of the impact. For example, limited impacts on a woodland of county importance might be assessed as being significant at a local level.
- 6.8.16 It should be noted that this approach differs from that set out in Table 3-4, chapter 3 EIA methodology and used in some other chapters where effects are assessed using a matrix, and classified as either: major, moderate, minor or negligible.
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## Mitigation and Residual Effects

- 6.8.17 The CIEEM Guidelines state that ‘a sequential process should be adopted to avoid, mitigate and compensate negative ecological impacts and effects’. This is often referred to as the ‘Mitigation Hierarchy’ which is also supported by the NPSWRI and the National Planning Policy Framework (2026) [26] (‘NPPF’). As set out in Section 6.7 above, the terrestrial biodiversity chapter of the ES will take into account primary and tertiary ecological mitigation. Where potential effects arise, secondary mitigation will be described. Residual effects will be those that remain after the implementation of mitigation measures.

## In-combination Effects

- 6.8.18 The assessment in the terrestrial biodiversity chapter of the ES will consider in-combination effects where impacts from multiple aspects of the Proposed Development interact to produce greater effects on terrestrial biodiversity receptors. Potential in-combination effects include:
- Combined effects on sensitive species (e.g. wintering birds) from construction noise and vibration disturbance in-combination with temporary habitat loss during construction.
  - Permanent habitat loss in-combination with temporary fragmentation of ecological corridors affecting population connectivity.
  - Habitat degradation through physical disturbance in-combination with effects from a reduction in air quality.
  - Habitat degradation at multiple different locations where more than one construction area is present.
- 6.8.19 In-combination effects will be assessed for each important ecological feature, with mitigation designed to address the combined pressure rather than individual impacts in isolation.
- 6.8.20 As set out in chapter 23 cumulative effects assessment of this Scoping Report, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within the ES.



- 6.8.21 A separate in-combination assessment in relation to international sites will also be set out within a separate Habitats Regulations Assessment ('HRA') for the Proposed Development.

### Limitations and Assumptions

- 6.8.22 The following limitations and assumptions have been identified in relation to the assessment of potentially significant effects on terrestrial biodiversity receptors:
- For some receptors, surveys may not cover the full study area but will be targeted to areas of suitable habitat or selected locations within that study area where there is ecological justification to do so. This would be clearly noted within the relevant baseline report.
  - The study area for each receptor will be reviewed as the design evolves, and more information becomes available through consultation and data gathering.
  - Whilst the Applicant will seek to gain access to all land within the study area for the purpose of field surveys, this may not be possible for all areas. As such, the geographical extent of field surveys may differ from that stated in Section 6.2. Any such limitations, and how these have been addressed or considered, will be described clearly within terrestrial biodiversity chapter of the ES.
  - Data supplied by records centres provides useful baseline information on the species that have been recorded within a local area and details of sites with nature conservation designations. This data often includes surveys undertaken by third parties on an 'ad hoc' basis so may be incomplete. Absence of species records may not therefore indicate absence of that species from an area. Despite these limitations, sourcing existing ecological data is a useful component part of the ecological assessment process and will be considered carefully in the assessment. However, it will not be relied on alone.
  - The BDCS for the assessment of the Proposed Development's likely significant effects refers to initial habitat data being secured through remote sensing. The use of habitat data secured through remote sensing will be undertaken in accordance with government guidance, as described in Section 6.4 and will not be relied upon alone for habitat valuation and BNG assessments. The habitat data will be 'ground-truthed' and condition assessment data collected for relevant habitats through on-site surveys in the relevant survey periods (where access allows, as above).
  - Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. The ecological surveys undertaken to support the



assessment may not therefore produce a complete list of plants and animals. The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it would not be present in the future.

- The assessment of likely significant effects in the terrestrial biodiversity chapter of the ES will assess the maximum parameters and ‘*cautious ‘worst case’*” in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026) with reference to basing assessments on a ‘*cautious ‘worst case’ approach*’.

### Biodiversity Net Gain

- 6.8.23 The Applicant is developing a BNG Implementation Plan for the Proposed Development which provides an overview of the approach to enable delivery of BNG and informs consultation with stakeholders.
- 6.8.24 The ES will also summarise the results of a BNG assessment with a full report appended to the ES. This assessment will assess the predicted habitat losses and gains associated with the Proposed Development and will set out how the Proposed Development anticipates achieving BNG, including any off-setting requirements.
- 6.8.25 The BNG assessment will describe how the Proposed Development will meet relevant policy or legislative requirements relating to BNG at the time of the submission of the DCO application. It should be noted that the regulations relating to the mandating of BNG for NSIPs are due to come into force prior to the submission of the DCO application. Defra’s Statutory Biodiversity Metric will be used for all calculations of biodiversity change for the Proposed Development and will take into account impacts on terrestrial (area) habitats, linear habitats and watercourses, where relevant. The calculations will take into account both permanent and temporary land-take associated with the Proposed Development, where relevant and in accordance with current guidance.
- 6.8.26 For clarity, the provision of BNG would not mitigate the loss of irreplaceable habitat.

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## Habitats Regulations Assessment

6.8.27 A separate HRA under the requirements of The Conservation of Habitats and Species Regulations 2017 (as amended) [27] will be undertaken to assess any likely significant effects from the Proposed Development. NE, the EA, and the Marine Management Organisation will be consulted with respect to the proposed approach to, and findings of, the HRA. The HRA will be undertaken in line with the Planning Inspectorate's NSIPs: Advice on Habitats Regulations Assessments [28] (the 'HRA guidance').

6.8.28 The following sites will be included within the HRA:

- SACs.
- SPAs.
- Proposed SACs.
- Potential SPAs.
- Ramsar sites (both listed and proposed).
- Sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation.

6.8.29 The HRA guidance sets out a three-stage approach to undertaking an HRA and emphasises the iterative nature of the process.

### Stage 1: Screening

6.8.30 The Screening stage involves the determination of the international sites which could potentially be affected by a proposed development and their determining interests; and whether the proposed development could result in a likely significant effect, either alone or 'in-combination' with other plans and projects.

### Stage 2: Appropriate Assessment

6.8.31 In the event that likely significant effects are identified at the Screening stage (in the absence of mitigation/avoidance measures), on the basis of objective information, the competent authority should proceed to the next stage of assessment. During Stage 2 (Appropriate Assessment), an assessment of whether there would be an adverse effect on the integrity of

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the international site concerned, and the consideration of measures to address this effect, is required. The precautionary principle should be applied, with the focus being on objectively demonstrating, with supporting evidence, that there will be no adverse effects on the integrity of the international site. Where this is not possible, adverse effects must be assumed.

- 6.8.32 Where appropriate measures can be put in place and the competent authority considers that the proposed development will not adversely affect the integrity of the international site, consent can be granted.
- 6.8.33 Where it is not possible to identify suitable measures to address the identified likely significant effects, or uncertainty remains, consideration of Stage 3 (Derogations) is required.

### Stage 3: Derogations

- 6.8.34 Stage 3 (Derogations) includes the following three tests:
- Assessment of alternative solutions.
  - Consideration of imperative reasons of overriding public interest ('IROPI').
  - Compensatory measures.
- 6.8.35 The assessment should identify and assess alternatives that have been considered. Alternative solutions could include a proposed development of a different scale, a different location, and an option of not having the proposed development at all (the 'do nothing' approach).
- 6.8.36 Where it can be demonstrated that there are no alternative solutions to the proposed development, that would have a lesser effect or avoid an adverse effect on the integrity of the international site, the proposed development may still be carried out if the competent authority is satisfied that it must be carried out for IROPI and that sufficient compensation measures have been provided.

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## 6.9 Summary of Impacts and Effects

- 6.9.1 Table 6-9 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the terrestrial biodiversity chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 6-9: Summary of Terrestrial Biodiversity Scope

| Receptor                                                                                                                       | Effects                                                                                                                                                                                                                                | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                      | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-------------------------------------------------|-----------------------|
| <b>Construction Phase</b>                                                                                                      |                                                                                                                                                                                                                                        |                       |                                     |                                                |                                                 |                       |
| Designated sites within 2km of the EIA Scoping Area (including international sites, SSSIs and non-statutory designated sites). | Loss of, or damage to, habitats through increase in deposition of pollutants (e.g. from vehicles), changes to hydrology, disturbance of qualifying species, loss of, or damage to, habitats which provide a supporting function (FLL). | Medium                | Up to International                 | Significant                                    | Timing restrictions, sensitive working methods. | Scoped in             |
| Designated sites located further than 2km from the EIA Scoping Area where                                                      | None – due to lack of impact pathways.                                                                                                                                                                                                 | Negligible            | Up to International                 | Not Significant                                | None required.                                  | Scoped out            |

| Receptor                                                                                                             | Effects                                                                                | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                               | Scoped in/ Scoped out |
|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| no impact pathways are evident.                                                                                      |                                                                                        |                       |                                     |                                                |                                                                                                                                                          |                       |
| Statutory designated sites located beyond 5km of the site which are designated for bird species or bird assemblages. | None – due to lack of impact pathways.                                                 | Negligible            | Up to International                 | Not Significant                                | None required.                                                                                                                                           | Scoped out            |
| Habitats                                                                                                             | Habitat loss, degradation or disturbance. Spread of INNS between terrestrial habitats. | High                  | Local – County                      | Significant                                    | Sensitive working methods. ecologically informed landscape design, implementation of INNS Biosecurity Protocol.                                          | Scoped in             |
| Coastal and intertidal habitats.                                                                                     | Habitat degradation or disturbance. Spread of INNS.                                    | Medium                | Local – County                      | Significant                                    | LSO design (Option 1) set back approximately 200m from clifftop, use of HDD technology. LSO design (Option 2 and Option 3) uses existing infrastructure. | Scoped in             |

| Receptor                                                                                                                       | Effects                                                                                                                                                                                                                                          | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                    | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Species, species groups.                                                                                                       | Displacement, species loss and isolation through fragmentation.<br>Direct mortality of wildlife during site clearance and construction.<br>Disturbance of wildlife from construction activities including visual, noise, vibration and lighting. | High                  | Local – Regional                    | Significant                                    | Compliance with protected species legislation and licensing requirements, sensitive working methods, temporary habitat linkages for wildlife. | Scoped in             |
| <b>Operational Phase</b>                                                                                                       |                                                                                                                                                                                                                                                  |                       |                                     |                                                |                                                                                                                                               |                       |
| Designated sites within 2km of the EIA Scoping Area (including international sites, SSSIs and non-statutory designated sites). | Increase in deposition of pollutants (e.g. from vehicles), changes to hydrology, disturbance of qualifying species                                                                                                                               | Medium                | Up to International                 | Significant                                    | Mitigation strategies, habitat enhancement/ compensation, sensitive operational working methods.                                              | Scoped in             |

| Receptor                                                                                                             | Effects                                                                                                                            | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures              | Scoped in/ Scoped out |
|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-----------------------------------------|-----------------------|
|                                                                                                                      | from operational activities which may generate noise or visual stimuli or impacts to habitats which provide a supporting function. |                       |                                     |                                                |                                         |                       |
| Designated sites located further than 2km from the EIA Scoping Area where no impact pathways are evident.            | None – due to lack of impact pathways.                                                                                             | Negligible            | Up to International                 | Not Significant                                | None required.                          | Scoped out            |
| Statutory designated sites located beyond 5km of the site which are designated for bird species or bird assemblages. | None – due to lack of impact pathways.                                                                                             | Negligible            | Up to International                 | Not Significant                                | None required.                          | Scoped out            |
| Habitats.                                                                                                            | Increase in deposition of                                                                                                          | Low                   | Local – County                      | Significant                                    | Ecologically informed landscape design, | Scoped in             |



| Receptor                                                       | Effects                                                                                                         | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                        | Scoped in/ Scoped out |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-------------------------------------------------------------------|-----------------------|
|                                                                | pollutants (e.g. from vehicles), changes to hydrology. Spread of INNS (during routine maintenance or washouts). |                       |                                     |                                                | INNS Biosecurity Protocol.                                        |                       |
| Coastal and intertidal habitats.                               | None – no impact pathways due to LSO passing beneath habitats.                                                  | Negligible            | Local – County                      | Not Significant                                | None required.                                                    | Scoped out            |
| Species, species groups.                                       | Disturbance to species from changes to hydrology, visual stimuli, noise, vibration and lighting.                | Low                   | Local – Regional                    | Significant                                    | Sensitive lighting design, sensitive operational working methods. | Scoped in             |
| <b>Decommissioning Phase</b>                                   |                                                                                                                 |                       |                                     |                                                |                                                                   |                       |
| Designated sites within 2km of the EIA Scoping Area (including | Loss of, or damage to, habitats through increase in                                                             | Medium                | Up to International                 | Significant                                    | Timing restrictions, sensitive working methods.                   | Scoped in             |

| Receptor                                                                                                  | Effects                                                                                                                                                                            | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/ Scoped out |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------|-----------------------|
| international sites, SSSIs and non-statutory designated sites).                                           | deposition of pollutants (e.g. from vehicles), changes to hydrology, disturbance of qualifying species, loss of, or damage to, habitats which provide a supporting function (FLL). |                       |                                     |                                                |                            |                       |
| Designated sites located further than 2km from the EIA Scoping Area where no impact pathways are evident. | None – due to lack of impact pathways.                                                                                                                                             | Negligible            | Up to International                 | Not Significant                                | None required.             | Scoped out            |
| Statutory designated sites located beyond 5km of the site which are designated for bird                   | None – due to lack of impact pathways.                                                                                                                                             | Negligible            | Up to International                 | Not Significant                                | None required.             | Scoped out            |

| Receptor                         | Effects                                                                  | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                      | Scoped in/ Scoped out                                                                                                                                                                                                                                                    |
|----------------------------------|--------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| species or bird assemblages.     |                                                                          |                       |                                     |                                                |                                                                                                                 |                                                                                                                                                                                                                                                                          |
| Habitats.                        | Habitat loss, degradation or disturbance.<br>Spread of INNS.             | High                  | Local – County                      | Significant                                    | Sensitive working methods, ecologically informed landscape design, implementation of INNS Biosecurity Protocol. | Scoped in (other than impacts on terrestrial biodiversity receptors during decommissioning of the proposed pipeline components. Decommissioning is likely to involve leaving the pipes in situ, and so there would be no impacts to terrestrial biodiversity receptors). |
| Coastal and intertidal habitats. | Decommissioning is likely to involve leaving the pipe in situ, but could | Medium                | Local – County                      | Significant                                    | LSO design (Option 1) to be left in situ.                                                                       | Scoped in                                                                                                                                                                                                                                                                |

| Receptor                 | Effects                                                                                                                                                                                                                                          | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                    | Scoped in/ Scoped out                                                                                                                                                                                                               |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | potentially be removed resulting in temporary habitat loss, damage or disturbance to habitats from decommissioning activities.                                                                                                                   |                       |                                     |                                                | LSO design (Option 2 and 3) uses existing infrastructure.                                                                                     |                                                                                                                                                                                                                                     |
| Species, species groups. | Displacement, species loss and isolation through fragmentation.<br>Direct mortality of wildlife during site clearance and construction.<br>Disturbance of wildlife from construction activities including visual, noise, vibration and lighting. | High                  | Local – Regional                    | Significant                                    | Compliance with protected species legislation and licensing requirements, sensitive working methods, temporary habitat linkages for wildlife. | Scoped in (other than impacts on terrestrial biodiversity receptors during decommissioning of the proposed pipeline components. Decommissioning is likely to involve leaving the pipes in situ, and so there would be no impacts to |

| Receptor | Effects | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/ Scoped out                |
|----------|---------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------|--------------------------------------|
|          |         |                       |                                     |                                                |                            | terrestrial biodiversity receptors). |

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## 7 Freshwater Biodiversity

### 7.1 Introduction

- 7.1.1 This chapter outlines the proposed scope and methodology for the assessment of the likely significant effects arising from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on freshwater biodiversity including designated sites, habitats and notable species. The assessment will be presented within an Environmental Statement (‘ES’) submitted with the application for a Development Consent Order (‘DCO’). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.
- 7.1.2 The EIA Scoping Area is shown on Figure 1-1. This chapter should be read in conjunction with the following chapters of this Scoping Report:
- Chapter 2 The Proposed Development.
  - Chapter 3 EIA Methodology.
  - Chapter 6 Terrestrial Biodiversity.
  - Chapter 8 Marine Biodiversity.
  - Chapter 11 Water Environment.
- 7.1.3 The assessment will identify and evaluate freshwater biodiversity receptors that are dependent upon freshwater aquatic environments for all or critical stages of their life cycle. These receptors include in-channel freshwater habitats, fish populations (including resident and migratory species), macroinvertebrate and diatom communities, aquatic macrophytes, and designated sites with freshwater qualifying features. This includes both lotic [1] and lentic [2] freshwater systems, together with associated lowland ditch, dyke and wetland habitats hydrologically connected to affected watercourses. Receptors that utilise freshwater habitats opportunistically, but do not depend on aquatic environments for their entire life cycle (such as semi-aquatic mammals and amphibians), are considered within chapter
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6 terrestrial biodiversity. Similarly, Groundwater Dependent Terrestrial Ecosystems ('GWDTEs') are also addressed within chapter 6 terrestrial biodiversity.

- 7.1.4 While Water Framework Directive [3] ('WFD') water bodies constitute the relevant management units for a river's catchment, they are not assessed as standalone ecological receptors within this chapter to avoid duplication with chapter 11 water environment. Instead, this chapter considers effects on the specific Biological Quality Elements ('BQEs'), comprising fish, macroinvertebrates, phytobenthic and aquatic macrophytes, that underpin the 'ecological status' of these water bodies.
- 7.1.5 The findings of the freshwater biodiversity assessment will inform both the EIA and a separate WFD Compliance Assessment. Freshwater ecological effects and their significance will be fully assessed within the ES as part of the EIA process. The WFD Compliance Assessment will be undertaken as a parallel regulatory assessment to determine compliance with WFD objectives, drawing on relevant BQEs and physicochemical and hydromorphological data. The WFD Compliance Assessment will therefore complement, but not replace, the assessment of the Proposed Development's likely significant ecological effects in the freshwater biodiversity chapter of the ES.
- 7.1.6 This freshwater biodiversity assessment will be undertaken by an experienced aquatic ecologist with professional accreditation through the Chartered Institute of Ecology and Environmental Management ('CIEEM'). The ecologist has extensive experience in freshwater biodiversity, aquatic survey methodologies, WFD Compliance Assessments, and Ecological Impact Assessment ('EclA') for major water resources infrastructure projects. The ecologist also holds an appropriate qualification in ecology and has experience with East of England river systems, including specialist knowledge of fish ecology, macroinvertebrate taxonomy, macrophyte identification, and river habitat assessment.

7.2 Study Area

- 7.2.1 The proposed study areas for freshwater biodiversity have been defined to identify receptors that may be directly, or indirectly, affected by the Proposed Development. The EIA Scoping Area, principal watercourses and associated freshwater habitats are shown on Figure 7-1. The study areas reflect anticipated Zones of Influence (‘Zol’) during the Proposed Development’s construction, operational, and decommissioning phases, accounting for potential impact pathways including changes to hydrology, water quality, species’ movement, and geomorphological processes. Potential pathways have also been identified with reference to hydraulic connectivity, downstream transport mechanisms and ecological connectivity between watercourses and associated wetland systems. The Zol will vary for different ecological features depending on their sensitivity to an environmental change, or the extent of their range. The approach is consistent with the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland Version 1.3 (2024) [4] (‘the CIEEM Guidelines’).
- 7.2.2 Appendix 7.1 to this chapter sets out the legislation, policy and guidance relevant to freshwater biodiversity. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.
- 7.2.3 For the desk-based study, the study areas for each receptor are set out in Table 7-1, along with supporting justification.

Table 7-1: Desk-based Study Search Areas

| Freshwater Biodiversity Receptor                                                                                                                                                                         | Study Area                             | Justification                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Statutory designated sites with aquatic or wetland interest: Special Areas of Conservation (‘SACs’), Ramsar sites, Special Sites of Scientific Interest (‘SSSIs’), National Nature Reserves (‘NNRs’) and | 10km radius from the EIA Scoping Area. | Reflects the potential for hydrological connectivity, particularly for sites associated with river systems, wetlands and floodplain habitats. Designated sites hydrologically connected to the Proposed Development |



| Freshwater Biodiversity Receptor                                        | Study Area                             | Justification                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Local Nature Reserves ('LNRs').                                         |                                        | will be considered irrespective of distance.                                                                                                                                                                                                                                                                                                                  |
| Fish, macroinvertebrates, diatoms and macrophytes (records).            | 2km radius from the EIA Scoping Area.  | Identifies records of aquatic species and biological communities that may indicate baseline ecological conditions within potentially affected watercourses. Accounts for local catchment-scale ecological records relevant to assessing potential impacts on BQEs.                                                                                            |
| Riparian habitats and watercourse features.                             | 500m radius from the EIA Scoping Area. | Identifies riparian habitats, channel features and ecological receptors that may be influenced by construction activities or localised hydrological changes.                                                                                                                                                                                                  |
| Migratory fish populations and catchment-scale ecological connectivity. | Wider Broadland Rivers Catchment.      | Identifies potential effects on migratory fish species and broader hydrological pathways resulting from connectivity to the wider catchment. The wider catchment context will also inform understanding of ecological connectivity, species movement and the potential propagation of hydrological and water quality effects beyond the immediate study area. |

7.2.4 The study areas will be reviewed iteratively as field survey results and hydrological, hydraulic, water quality and geomorphological evidence become available. Where this evidence identifies a wider Zol or additional ecological connectivity than is currently anticipated, the desk-study and field-survey areas will be extended to encompass the full predicted pathway and the distribution or extent of relevant receptors. This may include additional downstream reaches and hydrologically connected ditches, wetlands and designated sites. Any revised study area and its supporting justification will be reported in the ES and discussed with the relevant consultation bodies, where appropriate.

7.2.5 The following study areas will be used for survey data collection:

1. Primary study areas:

- All watercourses intersected by, crossed by, or located within, 500m of the EIA Scoping Area, and associated construction during the construction phase. This area reflects the zone within which direct disturbance, habitat modification, sediment mobilisation or pollution pathways could occur.

2. Secondary study areas:

- Downstream river reaches that may experience hydrological, hydraulic or water quality changes associated with operational discharge from the Proposed Development. The extent of downstream assessment will be determined based on the predicted Zol identified through hydrological and water quality assessments.

7.2.6 The survey study areas will be refined as the Proposed Development evolves. However, it is anticipated that the survey study areas for the ES will comprise the Order Limits and associated Zol, together with the radii described above, where appropriate.

## 7.3 Consultation and Engagement

7.3.1 Since June 2025, the Applicant has held monthly virtual meetings with representatives from Natural England ('NE') and the Environment Agency ('EA'), referred to as the 'Environmental Stakeholder Forum'. These meetings have included discussions on the proposed approach to the assessment of the Proposed Development's likely significant effects on freshwater biodiversity.

7.3.2 The Applicant has developed a Biodiversity Data Collection Strategy ('BDCS') (Appendix 6.2) which sets out the proposed approach to programme, study areas, and timing for data collection for freshwater biodiversity surveys that will be undertaken to inform the design evolution and assessment of likely significant effects resulting from the Proposed Development.

7.3.3 The aim of the BDCS is to ensure that data collection activities are suitable and proportionate. The BDCS was initially shared with NE and the EA on 5 June 2025, and comments were received from the EA on 18 August 2025,

requesting refinement of specific methods used for fish habitat surveys and timing of macrophyte surveys. The BDCS was updated to account for the EA's feedback in September 2025.

7.3.4 A topic-specific freshwater biodiversity virtual meeting was held with the EA on 7 November 2025. Matters discussed included:

- Aquatic monitoring strategy for the River Waveney.
- Survey approaches for watercourse crossings.
- Precautionary assumptions on species presence based on habitat suitability.
- Review of existing EA datasets (comprising macroinvertebrates, diatoms and fish).
- Requirements for baseline data to inform the ES.

7.3.5 The EA has provided initial feedback on the proposed assessment and monitoring approach, subject to the availability of detailed design information and supporting evidence. In addition to engagement with NE and the EA, the Applicant will engage with the following stakeholders in relation to freshwater biodiversity:

- The Broads Authority.
- Local Planning Authorities.
- River Waveney Trust.
- Local angling clubs and fisheries groups.
- Local community groups and environmental stakeholders.
- Internal Drainage Boards, where relevant.

7.3.6 A virtual meeting was held with Local Planning Authorities ('LPAs') on 22 January 2026. The LPAs that were present included Suffolk County Council, East Suffolk Council, Mid Suffolk District Council, Norfolk County Council, the Broads Authority, South Norfolk and Broadland District Councils. During the meeting, queries were raised regarding potential impacts on the River Waveney and the wider Broadland Rivers network. These included potential effects on designated sites, aquatic habitats and protected species, with particular emphasis placed on the need to maintain water quality and ecological connectivity. In response, these considerations

will be incorporated into the assessment of the Proposed Development's likely significant effects on freshwater biodiversity that has been proposed to be scoped into the ES. The assessment will consider potential effects on aquatic habitats, fish communities, aquatic invertebrates, macrophytes and designated sites during the construction, operational and decommissioning phases.

- 7.3.7 Further engagement with LPAs during a virtual meeting held on 12 May 2026 raised queries regarding the proposed monitoring strategy, the use of existing baseline datasets, and the assessment of effects associated with watercourse crossings and operational water transfers. Existing EA, WFD and ecological datasets will be used to inform the baseline, supported by targeted surveys, monitoring and modelling where required. Watercourse crossing methodologies and operational effects associated with abstraction and discharge activities will also be assessed within the ES. Additional scoping engagement was undertaken with the River Waveney Trust and Suffolk Wildlife Trust during a virtual meeting held on 15 January 2026, during which the importance of the River Waveney catchment, fish populations, habitat connectivity and ongoing river restoration initiatives was highlighted. Information provided by these stakeholders will be used to inform baseline characterisation, identify sensitive receptors and potential enhancement opportunities, and support the assessment of potential effects on fish populations, aquatic habitats and ecological connectivity in the ES.

## 7.4 Baseline Environment

- 7.4.1 The Proposed Development's components intersect several watercourses within the River Waveney catchment and wider North Suffolk area, including the Hundred River, the River Blyth catchment, and multiple small tributaries. Several of the Proposed Development's components also intersect lowland ditch systems, floodplain drainage channels and hydrologically connected wetland habitats associated with the Broads and coastal marsh systems. The Proposed Development also includes a proposed discharge to the River Waveney as shown in Figure 7-3.

- 7.4.2 At this scoping stage, baseline information has been derived from a desk-based study of available datasets, the sources for the baseline data are outlined in Table 7-2.

Table 7-2: Baseline Data Sources

| Data Source                                                                                                                         | Contents                                                           | Date Data Accessed/Received |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------|
| Multi Agency Geographic Information for the Countryside ('MAGIC') Maps (Department for Environment, Food & Rural Affairs ('Defra')) | Designated sites.                                                  | 1 June 2026.                |
| NE                                                                                                                                  | Designated site citations.                                         | 1 June 2026.                |
| EA Ecology and Fish Data Explorer                                                                                                   | Macroinvertebrate, diatom, macrophyte and fish monitoring records. | 1 June 2026.                |
| EA Catchment Data Explorer                                                                                                          | Water body status, pressures and objectives.                       | 1 June 2026.                |
| Ordnance Survey ('OS')                                                                                                              | Open Rivers dataset.                                               | 1 June 2026.                |
| Suffolk and Norfolk Biodiversity Information Services.                                                                              | Records of protected and notable freshwater species.               | 25 June 2026.               |

- 7.4.3 These sources provide a robust preliminary understanding of freshwater ecological conditions within the study areas and allow identification of potentially sensitive receptors and hydrological linkages between the Proposed Development and downstream water bodies.
- 7.4.4 A preliminary review has identified a long-term EA dataset for the River Waveney (Water Body ID: GB105034045900), including macroinvertebrate and diatom samples dating back to 1989, and fish monitoring at Broome Waterworks and Beccles Boat Yards from 1989 to 2025. These long-term datasets will assist in understanding baseline ecological variability and identifying trends against which potential effects arising from the Proposed Development can be assessed.

- 
- 7.4.5 Field surveys will be undertaken within the EIA Scoping Area to collect data on:
- Freshwater habitat quality.
  - Flow and hydromorphological conditions.
  - Macroinvertebrate communities.
  - Macrophyte and phytobenthos assemblages.
  - Fish habitat suitability and fish presence where required.
  - Riparian and in-channel habitat features.
  - Invasive Non-Native Species ('INNS') presence.
- 7.4.6 These datasets will be used to characterise relevant WFD BQEs and to support both the EIA and WFD compliance assessments.
- 7.4.7 Survey design and spatial coverage will be refined as the design of the Proposed Development evolves and will be agreed where appropriate with relevant consultation bodies including the EA and NE.
- 7.4.8 The ES will provide a full characterisation of freshwater ecological conditions based on desk study and field survey data and will describe and justify all data collection methods in accordance with the CIEEM Guidelines.
- 7.4.9 The scope and design of field surveys have been developed to align with the identified receptors and impact pathways described in this chapter, ensuring that sufficient baseline data is collected to support a robust assessment of likely significant effects.
- 7.4.10 The baseline environment in relation to freshwater biodiversity within the study area is summarised within the sections below.
- 7.4.11 Freshwater biodiversity receptors have been grouped into geographical areas, referred to as 'sections of the EIA Scoping Area', based on the following components of the Proposed Development (refer to Figure 1-3):
- Proposed Advanced Water Recycling Plant ('AWRP').
  - Proposed Long Sea Outfall ('LSO').
  - Proposed Central Service Reservoir ('CSR').
-

- Proposed Western Service Reservoir ('WSR').
- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
- Proposed CSR to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

7.4.12 Further information on each component is provided in chapter 2 the Proposed Development.

### Designated Sites

7.4.13 Table 7-3 provides a summary of international sites relevant to freshwater and transitional water biodiversity receptors within 10km of each section of the EIA Scoping Area. The terrestrial biodiversity Figures 6-1 and 6-2 presented in chapter 6 terrestrial biodiversity include these sites but are not limited to freshwater receptors.

Table 7-3: Summary of International Sites within 10km of each EIA Scoping Area Section

| EIA Scoping Area Section | Designated Site  | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                   |
|--------------------------|------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed AWRP            | Broadland Ramsar | 6.3                                                         | Diversity of wetland habitats and associated wetland bird species, as well as large numbers of rare plants and invertebrates.<br>Waterfowl assemblage of international importance.<br>Wintering birds: Bewick's Swan, Wigeon, Gadwall, Shoveler. |
|                          | The Broads SAC   | 6.3                                                         | Freshwater habitats including lakes, mire, bogs, fens, and wet woodland.                                                                                                                                                                         |

| EIA Scoping Area Section | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                                                                               |
|--------------------------|----------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |                                              |                                                             | The habitats support the following species: Desmoulin's whorl snail, Fen orchid, Ramshorn snail, otter.                                                                                                                                                                                                                                      |
| Proposed LSO             | Broadland Ramsar                             | 4.2                                                         | As above.                                                                                                                                                                                                                                                                                                                                    |
|                          | The Broads SAC                               | 4.2                                                         | As above.                                                                                                                                                                                                                                                                                                                                    |
|                          | Benacre to Easton Bavents SAC                | 8.5                                                         | Coastal lagoons: a series of percolation lagoons have formed behind shingle barriers and are a feature of a geomorphologically dynamic system.                                                                                                                                                                                               |
| Proposed CSR             | Minsmere to Walberswick Heaths & Marshes SAC | 7                                                           | Habitats including: drift lines, dry heath, and stony banks.                                                                                                                                                                                                                                                                                 |
|                          | Minsmere-Walberswick Ramsar                  | 7                                                           | Mosaic of coastal habitats, including shingle beaches, dunes, estuarine mudflats, grazing marshes, lagoons, reedbeds and heathland. The site supports an outstanding diversity of breeding birds.                                                                                                                                            |
| Proposed WSR             | Waveney & Little Ouse Valley Fens SAC        | 6.8                                                         | Freshwater habitats including: fens, and fen meadow.<br>The habitats support the following species: Desmoulin's whorl snail.                                                                                                                                                                                                                 |
|                          | Redgrave & South Lopham Fens Ramsar          | 6.8                                                         | The designated features of Redgrave and South Lopham Fens Ramsar site are its internationally important spring-fed valley fen system, which represents one of the finest examples of calcareous fen in the UK. This includes extensive reedbeds, sedge fen, flushes, and open water channels, supporting rich assemblages of fen vegetation, |



| EIA Scoping Area Section                | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                               |
|-----------------------------------------|----------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         |                                              |                                                             | rare and specialised wetland invertebrates including a population of the fen raft spider, and a naturally functioning groundwater-fed hydrological system. This includes areas of wet heath and areas of reed and saw sedge. |
| Proposed AWRP to River Waveney Pipeline | Broadland Ramsar                             | 0.2                                                         | As above.                                                                                                                                                                                                                    |
|                                         | The Broads SAC                               | 0.2                                                         | As above.                                                                                                                                                                                                                    |
| Proposed Barsham WTW to CSR Pipeline    | Broadland Ramsar                             | 2.4                                                         | As above.                                                                                                                                                                                                                    |
|                                         | The Broads SAC                               | 2.4                                                         | As above.                                                                                                                                                                                                                    |
|                                         | Minsmere To Walberswick Heaths & Marshes SAC | 6.9                                                         | As above.                                                                                                                                                                                                                    |
|                                         | Minsmere-Walberswick Ramsar                  | 6.9                                                         | As above.                                                                                                                                                                                                                    |
| Proposed CSR to WSR Pipeline            | Minsmere To Walberswick Heaths & Marshes SAC | 7.9                                                         | As above.                                                                                                                                                                                                                    |
|                                         | Minsmere-Walberswick Ramsar                  | 7.9                                                         | As above.                                                                                                                                                                                                                    |
|                                         | Waveney & Little Ouse Valley Fens SAC        | 8.4                                                         | As above.                                                                                                                                                                                                                    |

| EIA Scoping Area Section            | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                   |
|-------------------------------------|----------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------|
|                                     | Redgrave & South Lopham Fens Ramsar          | 8.4                                                         | As above.                                                                        |
| Proposed CSR to Saxmundham Pipeline | Alde-Ore & Butley Estuaries SAC              | 5.1                                                         | Estuary habitats including mudflats, sandflats, and salt marsh.                  |
|                                     | Minsmere to Walberswick Heaths & Marshes SAC | 7.0                                                         | As above.                                                                        |
|                                     | Minsmere-Walberswick Ramsar                  | 7.0                                                         | As above.                                                                        |
| Proposed Saxmundham to SZC Pipeline | Minsmere to Walberswick Heaths & Marshes SAC | 0.04                                                        | As above.                                                                        |
|                                     | Minsmere-Walberswick Ramsar                  | 0.04                                                        | As above.                                                                        |
|                                     | Alde-Ore & Butley Estuaries SAC              | 6.1                                                         | As above.                                                                        |
|                                     | Orfordness-Shingle Street SAC                | 9.6                                                         | Habitats including: coastal lagoons, vegetation of drift lines, and stony banks. |
| Proposed Eastern Distribution Mains | Waveney & Little Ouse Valley Fens SAC        | 6.6                                                         | As above.                                                                        |
|                                     | Redgrave & South Lopham Fens Ramsar          | 6.6                                                         | As above.                                                                        |

| EIA Scoping Area Section            | Designated Site             | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                 |
|-------------------------------------|-----------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed Western Distribution Mains | None identified within 10km | N/A                                                         | No internationally designated sites have currently been identified within 10km of this section of the EIA Scoping Area. Hydrologically connected sites will nevertheless be considered irrespective of distance where a credible impact pathway is identified. |

7.4.14 Table 7-4 summarises nationally and locally designated sites for freshwater and brackish water biodiversity located within 2km of each section of the EIA Scoping Area.

Table 7-4: Summary of Nationally and Locally Designated Sites within 2km of each EIA Scoping Area Section

| EIA Scoping Area Section | Designated Site | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------|-----------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed AWRP            | Lound Lakes CWS | 0.7                                                         | The site contains extensive freshwater lake habitats with diverse aquatic vegetation, including water lilies, water starworts, floating bur-reed, water violet, and lesser water plantain. It also supports notable stonewort (charophyte) communities such as <i>Nitella translucens</i> and <i>Chara virgata</i> . These open water systems provide important conditions for aquatic plant diversity and freshwater habitat structure. |
| Proposed LSO             | Lound Lakes CWS | 0.7                                                         | As above.                                                                                                                                                                                                                                                                                                                                                                                                                                |

| EIA Scoping Area Section                | Designated Site                      | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------|--------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed CSR                            | Dew's Ponds SSSI                     | 1.3                                                         | The aquatic interest of the site lies in its network of 12 freshwater ponds, which range from long-established farm ponds to more recently created ponds. These ponds support a variety of emergent and submerged aquatic vegetation, including the nationally scarce bearded stonewort ( <i>Chara canescens</i> ), and provide exceptional breeding habitat for one of the UK's largest known populations of great crested newts, alongside other amphibian species. |
| Proposed WSR                            | Gypsy Camp Meadows, Thrandeston SSSI | 1.0                                                         | The aquatic features of Gypsy Camp Meadows consist of a network of drainage ditches and permanently wet meadow systems on poorly drained boulder clay with a high-water table. These wet habitats support a range of aquatic and semi-aquatic macrophytes, contributing to the site's high freshwater botanical diversity.                                                                                                                                            |
| Proposed AWRP to River Waveney Pipeline | Stanley and Alder Carrs, Aldeby SSSI | 0.2                                                         | Extensive area of regularly flooded alder carr woodland and fen. The site supports a diverse range of macrophytes.                                                                                                                                                                                                                                                                                                                                                    |
|                                         | Geldeston Meadows SSSI               | 0.3                                                         | The site lies within the River Waveney floodplain and includes a high water-table wet meadow system, seasonal winter flooding, a network of drainage dykes, and areas of alder carr. These aquatic and semi-aquatic habitats support a diverse range of macrophytes, together with fen meadow species associated with permanently wet conditions.                                                                                                                     |

| EIA Scoping Area Section             | Designated Site                              | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------|----------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | Barnby Broad & Marshes SSSI                  | 1.7                                                         | Open water, carr woodland, fen, grazing marsh and dykes (ditches).                                                                                                                                                                                                                                                                                                                                                                                    |
| Proposed Barsham WTW to CSR Pipeline | Dew's Ponds SSSI                             | 1.3                                                         | As above.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Proposed CSR to WSR Pipeline         | N/A                                          |                                                             | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Proposed CSR to Saxmundham Pipeline  | Dew's Ponds SSSI                             | 1.3                                                         | As above.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Proposed Saxmundham to SZC Pipeline  | Sizewell Marshes SSSI                        | Adjacent                                                    | Sizewell Marshes comprise a low-lying wetland system with a permanently high-water table, extensive ditch networks, wet meadows, reedbeds, and alder carr. The ditches support a rich aquatic flora, including nationally scarce species such as soft hornwort, fen pondweed, and whorled water-milfoil, while the diverse wetland habitats provide important breeding areas for waterbirds and support outstanding aquatic invertebrate communities. |
|                                      | Minsmere-Walberswick Heaths and Marshes SSSI | Adjacent                                                    | The site is of national importance for its diverse aquatic habitats, including tidal mudflats, saltmarshes, brackish lagoons, reedbeds, grazing marshes, and species-rich dykes. These interconnected coastal wetlands support important populations of waterbirds, diverse aquatic plant communities, and nationally rare wetland invertebrates.                                                                                                     |

| EIA Scoping Area Section            | Designated Site                      | Approximate Distance (km) from the EIA Scoping Area Section | Summary of Qualifying Features                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed Eastern Distribution Mains | Gypsy Camp Meadows, Thrandeston SSSI | 0.8                                                         | As above.                                                                                                                                                                                                                                                                                                                                                                                                       |
| Proposed Western Distribution Mains | None within 2km                      | N/A                                                         | No nationally or locally designated sites with relevant freshwater or brackish-water features have been identified within 2km of the Western Distribution Mains section of the EIA Scoping Area based on the current desk-study information. Any designated sites located beyond 2km will still be considered where a credible hydrological or ecological connection to the Proposed Development is identified. |

### Priority Rivers and Priority Habitat Watercourses

- 7.4.15 Table 6-4 and Figure 6-3 in chapter 6 terrestrial biodiversity provide a summary, including the location, of priority and irreplaceable habitats within 500m of each section of the EIA Scoping Area.
- 7.4.16 No priority river habitats were identified within 500m of the EIA Scoping Area. However, a section of the River Blyth located in proximity to the proposed CSR section of the EIA Scoping Area is identified as a priority river habitat and is hydrologically connected to the EIA Scoping Area. Although located marginally beyond the defined search radius, it will be considered within the assessment due to its ecological importance and potential hydrological connectivity. The location of the River Blyth priority river habitat is shown on Figure 7-2 and Figure 6-3.

7.4.17 No additional priority river habitat watercourses were identified within 500m of the other EIA Scoping Area sections based on currently available desk-based study information.

### Watercourse Type (Habitats)

7.4.18 This section provides a summary of the watercourses identified within the EIA Scoping Area based on currently available information. Watercourses and associated aquatic habitats have been identified using OS mapping, aerial imagery, the EA Statutory Main Rivers Map and available desk-based environmental datasets [5]. These are summarised in Table 7-5 and shown in Figure 7-1. Further details of terrestrial habitats relevant to each location are highlighted in Table 6-5 of chapter 6 terrestrial biodiversity.

Table 7-5: Summary of Watercourses within 500m of each EIA Scoping Area Section

| EIA Scoping Area Section | Summary of Watercourses within the EIA Scoping Area and a 500m radius of the EIA Scoping Area                                                                                                                                                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed AWRP            | Tributaries of the River Waveney, including The Fleet, are located within the EIA Scoping Area and/or within 500m of its boundary. Mill Water and associated drainage features are also located within the study area. These watercourses form part of a network of lowland rivers, ordinary watercourses and drainage ditches with hydrological connectivity to the wider Waveney Valley. |
| Proposed LSO             | Mill Water and associated ordinary watercourses and drainage ditches are located within 500m of this section of the EIA Scoping Area. The surrounding area includes lowland wetland and drainage habitats with hydrological connectivity to the wider Broads catchment.                                                                                                                    |
| Proposed CSR             | Ditches connected to Packway Water and tributaries of the River Blyth are located within this section of the EIA Scoping Area and/or within 500m of its boundary. Watercourses in this area are predominantly low-gradient lowland systems comprising modified channels, ordinary watercourses and agricultural drainage ditches.                                                          |
| Proposed WSR             | Tributaries of the River Dove and associated ordinary watercourses and drainage ditches are located within this section of the EIA Scoping Area and/or within 500m of its boundary. The surrounding landscape includes                                                                                                                                                                     |

| EIA Scoping Area Section                | Summary of Watercourses within the EIA Scoping Area and a 500m radius of the EIA Scoping Area                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | wet ditches and floodplain drainage features that provide ecological and hydrological connectivity to the wider River Waveney catchment.                                                                                                                                                                                                                                                                                 |
| Proposed AWRP to River Waveney Pipeline | The River Waveney, Bowling Alley Reach and an extensive network of floodplain drainage ditches and ordinary watercourses are located within this section of the EIA Scoping Area and/or within 500m of its boundary. These watercourses form a complex lowland river and drainage network, with potential tidal influence and strong hydrological connectivity to designated wetland habitats.                           |
| Proposed Barsham WTW to CSR Pipeline    | Barsham Beck and its tributaries are located within or within 500m of this section of the EIA Scoping Area. The corridor also intersects or passes close to the River Blyth and a network of associated tributaries, ordinary watercourses and agricultural drainage ditches. Watercourses within this area include both semi-natural and modified lowland channels supporting a range of aquatic and riparian habitats. |
| Proposed CSR to WSR Pipeline            | The River Dove and its tributaries are located within this section of the EIA Scoping Area, together with associated ordinary watercourses and agricultural drainage ditches. The corridor also lies within the wider River Blyth catchment. The area comprises a network of lowland tributaries, modified drainage channels and locally connected wetland habitats.                                                     |
| Proposed CSR to Saxmundham Pipeline     | The River Yox, the River Fromus and their tributaries are located within this section of the EIA Scoping Area and/or within 500m of its boundary. The corridor also intersects a network of ordinary watercourses and agricultural drainage ditches. These watercourses comprise predominantly lowland river and drainage systems with locally connected wetland habitats.                                               |
| Proposed Saxmundham to SZC Pipeline     | The River Fromus and the Hundred River are located within or within 500m of this section of the EIA Scoping Area. The corridor also intersects or passes close to ordinary watercourses, drainage ditches and wetland habitats associated with the Sizewell and Minsmere marsh systems.                                                                                                                                  |
| Proposed Eastern Distribution Mains     | The River Dove and its tributaries, together with a network of ordinary watercourses and agricultural drainage ditches, are located within the Eastern                                                                                                                                                                                                                                                                   |



| EIA Scoping Area Section            | Summary of Watercourses within the EIA Scoping Area and a 500m radius of the EIA Scoping Area                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | Distribution Mains section of the EIA Scoping Area and/or within 500m of its boundary. These watercourses extend through the lowland landscape around Mellis, Yaxley, Thrandeston and Eye and include wet ditch and floodplain drainage habitats with ecological connectivity to the wider River Waveney catchment.                                                                                                          |
| Proposed Western Distribution Mains | The Dove tributary – Finningham and associated tributaries, ordinary watercourses and agricultural drainage ditches are located within the Western Distribution Mains section of the EIA Scoping Area and/or within 500m of its boundary. These are predominantly small, low-gradient lowland channels around Finningham, with downstream hydrological connectivity to the River Dove and the wider River Waveney catchment. |

7.4.19 WFD status information for water bodies within the study areas and hydrologically connected catchments is summarised in Table 7-6, the relevant WFD water bodies are shown on Figure 7-1. The majority of affected water bodies are classified as ‘moderate’ ecological status or potential, with several designated as Heavily Modified Water Bodies (‘HMWBs’). BQE classifications indicate varying ecological sensitivities across the study areas, including water bodies currently affected by fish, macrophyte and invertebrate pressures. These classifications provide an important baseline for understanding the existing ecological condition of receiving water environments and informing the assessment of likely significant effects resulting from the Proposed Development.

Table 7-6: WFD Status Classifications

| Operational Catchment | Water Body ID  | Water Body                                 | Hydromorphological Designation                | Classification Item | Year | Status   | Cycle |
|-----------------------|----------------|--------------------------------------------|-----------------------------------------------|---------------------|------|----------|-------|
| Waveney               | GB105034045660 | Dove tributary - Finningham                | Not designated artificial or heavily modified | Ecological          | 2022 | Moderate | 3     |
|                       |                |                                            |                                               | Invertebrates       | 2022 | Good     | 3     |
|                       |                |                                            |                                               | Phytobenthos        | 2022 | Good     | 3     |
|                       | GB105034045690 | Chickering Beck                            | Not designated artificial or heavily modified | Ecological          | 2022 | Moderate | 3     |
|                       |                |                                            |                                               | Phytobenthos        | 2014 | Good     | 2     |
|                       | GB105034045710 | Dove                                       | Heavily modified                              | Ecological          | 2022 | Moderate | 3     |
|                       |                |                                            |                                               | Fish                | 2022 | Moderate | 3     |
|                       |                |                                            |                                               | Invertebrates       | 2022 | Good     | 3     |
|                       |                |                                            |                                               | Macrophytes         | 2022 | Moderate | 3     |
|                       | GB105034045903 | Waveney (Ellingham Mill - Burgh St. Peter) | Heavily modified                              | Ecological          | 2022 | Moderate | 3     |
|                       |                |                                            |                                               | Invertebrates       | 2022 | Good     | 3     |
| Suffolk Coastal       | GB105035045980 | Fromus                                     |                                               | Ecological          | 2022 | Poor     | 3     |
|                       |                |                                            |                                               | Fish                | 2022 | Poor     | 3     |

| Operational Catchment | Water Body ID  | Water Body                              | Hydromorphological Designation                | Classification Item | Year | Status   | Cycle |
|-----------------------|----------------|-----------------------------------------|-----------------------------------------------|---------------------|------|----------|-------|
|                       |                |                                         | Not designated artificial or heavily modified | Invertebrates       | 2022 | Good     | 3     |
|                       |                |                                         |                                               | Macrophytes         | 2022 | Good     | 3     |
|                       | GB105035046030 | Blyth (Hevingham Hall - d/s Halesworth) | Heavily modified                              | Ecological          | 2022 | Good     | 3     |
|                       |                |                                         |                                               | Fish                | 2014 | Moderate | 1     |
|                       |                |                                         |                                               | Invertebrates       | 2022 | High     | 3     |
|                       |                |                                         |                                               | Macrophytes         | 2022 | Good     | 3     |
|                       |                |                                         |                                               |                     |      |          |       |
|                       | GB105035046050 | Chediston Watercourse                   | Heavily modified                              | Ecological          | 2022 | Moderate | 3     |
|                       |                |                                         |                                               | Invertebrates       | 2022 | Good     | 3     |
|                       | GB105035046070 | Blyth (u/s Halesworth)                  | Heavily modified                              | Ecological          | 2022 | Moderate | 3     |
|                       |                |                                         |                                               | Invertebrates       | 2022 | Poor     | 3     |
|                       | GB105035046270 | Minsmere Old River                      | Heavily modified                              | Ecological          | 2022 | Moderate | 3     |
|                       |                |                                         |                                               | Fish                | 2022 | Poor     | 3     |
|                       |                |                                         |                                               | Invertebrates       | 2022 | Good     | 3     |
|                       |                |                                         |                                               | Macrophytes         | 2022 | Moderate | 3     |
|                       | GB510503410700 |                                         |                                               | Ecological          | 2022 | Moderate | 3     |

| Operational Catchment                          | Water Body ID | Water Body                      | Hydromorphological Designation | Classification Item | Year | Status   | Cycle |
|------------------------------------------------|---------------|---------------------------------|--------------------------------|---------------------|------|----------|-------|
| Norfolk East Transitional and Coastal ('TraC') |               | Bure & Waveney & Yare & Lothing | Heavily modified               | Fish                | 2012 | Good     | 1     |
|                                                |               |                                 |                                | Invertebrates       | 2022 | Moderate | 3     |

- 7.4.20 The principal reasons for not achieving ‘good’ ecological status or ‘good’ ecological potential across affected water bodies relate to nutrient enrichment, sewage discharge, sedimentation, physical modification, barriers to fish movement, land drainage activities and abstraction pressures. These pressures are particularly relevant to the assessment of potential effects associated with discharge, flow alteration, sediment mobilisation and habitat connectivity.
- 7.4.21 Protected area designations associated with the affected water bodies include international nature conservation sites, Drinking Water Protected Areas, Nitrate Vulnerable Zones (‘NVZs’), Urban Waste Water Treatment Directive [6] protected areas and Safeguard Zones.

Table 7-7: Protections within the Impacted Water Bodies

| Protected Area                           | Protection                   | GB105035046<br>270 | GB105035046<br>030 | GB105034045<br>690 | GB105034045<br>903 | GB105035045<br>980 | GB105035046<br>070 | GB105035046<br>050 | GB105034045<br>710 | GB510503410<br>700 | GB105034045<br>660 |
|------------------------------------------|------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Sandlings and Chelmsford                 | Nitrates Directive           | x                  |                    |                    |                    | x                  |                    |                    |                    |                    |                    |
| Minsmere-Walberswick                     | Ramsar Site                  | x                  |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Minsmere-Walberswick                     | Special Protection Area      | x                  |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Minsmere to Walberswick Heaths & Marshes | Special Area of Conservation | x                  |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Yoxford                                  | Nitrates Directive           | x                  |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Leiston Beck NVZ                         | Nitrates Directive           | x                  |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Leiston Beck and Minsmere Old River NVZ  | Nitrates Directive           | x                  |                    |                    |                    |                    |                    |                    |                    |                    |                    |

| Protected Area                             | Protection                            | GB105035046<br>270 | GB105035046<br>030 | GB105034045<br>690 | GB105034045<br>903 | GB105035045<br>980 | GB105035046<br>070 | GB105035046<br>050 | GB105034045<br>710 | GB510503410<br>700 | GB105034045<br>660 |
|--------------------------------------------|---------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Outer Thames Estuary                       | Special Protection Area               | x                  |                    |                    |                    |                    |                    |                    |                    | x                  |                    |
| Blyth NVZ                                  | Nitrates Directive                    | x                  | x                  |                    |                    |                    | x                  | x                  |                    |                    |                    |
| Byford                                     | Nitrates Directive                    |                    | x                  |                    |                    |                    |                    |                    |                    |                    |                    |
| River Waveney NVZ                          | Nitrates Directive                    |                    |                    | x                  | x                  |                    |                    |                    | x                  |                    | x                  |
| The Broads                                 | Special Area of Conservation          |                    |                    |                    | x                  |                    |                    |                    |                    | x                  |                    |
| Broadland                                  | Special Protection Area               |                    |                    |                    | x                  |                    |                    |                    |                    | x                  |                    |
| Broadland                                  | Ramsar Site                           |                    |                    |                    | x                  |                    |                    |                    |                    | x                  |                    |
| Norwich Crag and Gravels                   | Nitrates Directive                    |                    |                    |                    | x                  |                    |                    |                    |                    |                    |                    |
| Waveney (Ellingham Mill - Burgh St. Peter) | Drinking Water Protected Area         |                    |                    |                    | x                  |                    |                    |                    |                    |                    |                    |
| River Waveney/ Starston Brook & River Dove | Urban Waste Water Treatment Directive |                    |                    |                    | x                  |                    |                    |                    | x                  | x                  |                    |
| River Waveney                              | Safeguard Zone                        |                    |                    |                    | x                  |                    |                    |                    |                    |                    |                    |
| Fromus NVZ                                 | Nitrates Directive                    |                    |                    |                    |                    | x                  |                    |                    |                    |                    |                    |
| River Bure                                 | Urban Waste Water Treatment Directive |                    |                    |                    |                    |                    |                    |                    |                    | x                  |                    |
| Breydon Water                              | Ramsar Site                           |                    |                    |                    |                    |                    |                    |                    |                    | x                  |                    |

| Protected Area | Protection              | GB105035046<br>270 | GB105035046<br>030 | GB105034045<br>690 | GB105034045<br>903 | GB105035045<br>980 | GB105035046<br>070 | GB105035046<br>050 | GB105034045<br>710 | GB510503410<br>700 | GB105034045<br>660 |
|----------------|-------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Breydon Water  | Special Protection Area |                    |                    |                    |                    |                    |                    |                    |                    | X                  |                    |

7.4.22 The EA Ecology and Fish Data Explorer was reviewed for monitoring locations within 2km of crossing points and 5km of discharge/abstraction locations (Table 7-8). Within the defined study area, a relatively limited number of monitoring locations have been sampled within the last 10 years. The search focused on monitoring locations within close proximity to proposed watercourse crossings, discharge locations and abstraction locations, although additional monitoring data are available elsewhere within the wider catchments.

Table 7-8: Environment Agency Monitoring Locations within 2km of Crossing Points and 5km of Discharge Locations

| Receptor | Operational Catchment | WBID           | Name                                       | Site ID | NGR          | Count Of Samples | Last Sample Date |
|----------|-----------------------|----------------|--------------------------------------------|---------|--------------|------------------|------------------|
| Diatom   | Suffolk Coastal       | GB105035046070 | Blyth (u/s Halesworth)                     | 160452  | TM3828977729 | 1                | 15/05/2013       |
|          | Waveney               | GB105034045710 | Dove                                       | 92416   | TM1591075710 | 3                | 31/08/2012       |
|          |                       |                |                                            | 92413   | TM1504073780 | 2                | 31/08/2012       |
| Fish     | Norfolk East TraC     | GB510503410700 | Bure & Waveney & Yare & Lothing            | 1678    | TM4970093800 | 4                | 30/09/1999       |
|          | Suffolk Coastal       | GB105035045980 | Fromus                                     | 617     | TM3850065200 | 2                | 01/02/2006       |
|          |                       | GB105035046270 | Minsmere Old River                         | 629     | TM3790070000 | 2                | 20/02/2006       |
|          |                       | GB105035046030 | Blyth (Hevingham Hall - d/s Halesworth)    | 24      | TM3900076500 | 4                | 17/05/1995       |
|          |                       |                |                                            | 23      | TM3750075500 | 2                | 18/05/1995       |
|          |                       |                | Blyth (d/s Halesworth)                     | 25      | TM3970076800 | 7                | 01/08/2016       |
|          | Waveney               | GB105034045690 | Chickering Beck                            | 1746    | TM1770077300 | 3                | 31/08/1999       |
|          |                       | GB105034045710 | Dove                                       | 1743    | TM1730077500 | 8                | 07/05/2024       |
|          |                       |                |                                            | 1740    | TM1510073700 | 6                | 24/07/2012       |
|          |                       |                |                                            | 1741    | TM1581975255 | 5                | 19/04/2006       |
|          |                       |                |                                            | 1742    | TM1680076700 | 5                | 18/04/2006       |
|          |                       | GB105034045903 | Waveney (Ellingham Mill - Burgh St. Peter) | 1679    | TM5010093700 | 3                | 30/09/1999       |
|          |                       |                |                                            | 1671    | TM4220091400 | 3                | 01/10/1999       |
|          |                       |                |                                            | 32250   | TM4204191229 | 16               | 09/01/2025       |
|          |                       |                |                                            | 1673    | TM4320092600 | 4                | 05/10/1999       |
|          |                       |                |                                            | 1672    | TM4230092300 | 3                | 01/10/1999       |



| Receptor     | Operational Catchment | WBID           | Name                                      | Site ID | NGR          | Count Of Samples | Last Sample Date |
|--------------|-----------------------|----------------|-------------------------------------------|---------|--------------|------------------|------------------|
|              |                       |                | Broome Beck                               | 1735    | TM3588691661 | 2                | 20/04/1993       |
|              |                       |                | Waveney (Starston Brook - Ellingham Mill) | 1732    | TM3530090400 | 3                | 11/07/1996       |
|              |                       |                |                                           | 1733    | TM3580091200 | 5                | 21/08/2014       |
|              |                       |                |                                           | 12808   | TM3515790238 | 11               | 25/09/2023       |
|              |                       |                |                                           | 1731    | TM3500090200 | 5                | 28/06/2006       |
|              |                       |                | Broome Beck                               | 1734    | TM3430092300 | 2                | 25/05/1993       |
| Invertebrate | Suffolk Coastal       | GB105035046070 | Blyth (u/s Halesworth)                    | 160452  | TM3828977729 | 9                | 10/04/2025       |
|              |                       | GB105035046030 | Blyth (Hevingham Hall - d/s Halesworth)   | 54789   | TM3900076400 | 29               | 07/04/2009       |
|              |                       |                |                                           | 160455  | TM3751375521 | 12               | 30/04/2022       |
|              |                       | GB105035046050 | Chediston Watercourse                     | 80706   | TM3821277539 | 28               | 06/11/2019       |
|              |                       |                | Blyth (New Reach through Halesworth)      | 54788   | TM3850077500 | 19               | 12/10/2004       |
|              | Waveney               | GB105034045710 | Dove                                      | 54837   | TM1510073770 | 60               | 01/10/2025       |
|              |                       |                |                                           | 54838   | TM1700077000 | 23               | 09/03/2015       |
|              |                       |                | Broome Beck                               | 54940   | TM3550092200 | 31               | 05/09/2013       |
|              |                       |                | Waveney (Starston Brook - Ellingham Mill) | 56672   | TM3380090300 | 1                | 14/07/1989       |
| Macrophyte   | Suffolk Coastal       | GB105035046030 | Blyth (Hevingham Hall - d/s Halesworth)   | 160456  | TM3903376468 | 1                | 15/07/2013       |
|              |                       |                | Blyth (New Reach through Halesworth)      | 160454  | TM3895077366 | 1                | 15/07/2013       |
|              | Waveney               | GB105034045710 | Dove                                      | 92416   | TM1591075710 | 9                | 26/07/2012       |

| Receptor | Operational Catchment | WBID | Name        | Site ID | NGR          | Count Of Samples | Last Sample Date |
|----------|-----------------------|------|-------------|---------|--------------|------------------|------------------|
|          |                       |      |             | 146620  | TM1520874245 | 1                | 29/08/2007       |
|          |                       |      |             | 92413   | TM1504073780 | 11               | 15/07/2014       |
|          |                       |      | Broome Beck | 161085  | TM3551892151 | 2                | 11/08/2015       |

## Fish

- 7.4.23 Existing EA fish monitoring data is available for the River Waveney, including long-term records from Broome Waterworks and Beccles Boat Yards between 1989 and 2025. This data provides a useful baseline for understanding fish community composition, temporal variability and the potential presence of migratory and resident fish species within the Zol of the proposed discharge and abstraction locations.
- 7.4.24 The River Waveney and its tributaries may support a range of fish species, including species associated with slow-flowing lowland rivers, marginal vegetation and connected ditch systems. Fish habitat suitability will be assessed during field surveys, with particular attention to spawning, nursery, refuge and migration habitat, and to any areas that may be sensitive to changes in flow, water quality, entrainment risk or temporary construction disturbance. Consideration will be given to species sensitive to barriers, reduced dissolved oxygen, sediment mobilisation and altered flow conditions.
- 7.4.25 The study area supports a wide variety of fish species, the most varied assemblages evidenced within the Waveney Operational Catchment (Table 7-9).

Table 7-9: Species List (and the Number of Samples Where Fish is Present) of Fish Present within 2km/5km of Crossing/Discharge Locations (EA Ecology and Fish Data Explorer)

| Species                | Norfolk East TraC | Suffolk Coastal | Waveney |
|------------------------|-------------------|-----------------|---------|
| Common bream           | 2                 |                 | 30      |
| Common goby            | 1                 |                 |         |
| European eels > elvers | 1                 | 14              | 33      |
| Flounder               | 3                 |                 | 5       |
| Gudgeon                | 1                 | 2               | 35      |
| Roach                  | 4                 | 8               | 72      |
| Ruffe                  | 1                 |                 | 13      |
| Smelt                  | 2                 |                 | 4       |
| 10-spined stickleback  |                   | 4               | 8       |
| 3-spined stickleback   |                   | 9               | 24      |

| Species                     | Norfolk East TraC | Suffolk Coastal | Waveney |
|-----------------------------|-------------------|-----------------|---------|
| Dace                        |                   | 10              | 48      |
| Feral [brown] goldfish      |                   | 1               |         |
| Pike                        |                   | 1               | 63      |
| Rudd                        |                   | 4               | 19      |
| Stone loach                 |                   | 12              | 31      |
| Bullhead                    |                   |                 | 11      |
| Chub                        |                   |                 | 37      |
| Common [wild] carp          |                   |                 | 1       |
| European eel                |                   |                 | 4       |
| Minnow                      |                   |                 | 1       |
| Perch                       |                   |                 | 52      |
| Pike varieties              |                   |                 | 1       |
| Roach x chub hybrid         |                   |                 | 2       |
| Roach x common bream hybrid |                   |                 | 11      |
| Roach x dace hybrid         |                   |                 | 2       |
| Roach x rudd hybrid         |                   |                 | 3       |
| Tench                       |                   |                 | 11      |

## Macroinvertebrates

- 7.4.26 EA macroinvertebrate monitoring data are available for watercourses within the River Waveney and Suffolk Coastal catchments, with records extending back to 1989. These data comprise routine biomonitoring surveys undertaken to support WFD classification and provide an important evidence base for characterising baseline ecological condition and sensitivity to environmental change.
- 7.4.27 Watercourses within the study area comprise a range of lowland river, drainage ditch and floodplain wetland habitats that are expected to support diverse macroinvertebrate assemblages. Community composition is likely to vary according to habitat type, flow regime, substrate characteristics, aquatic vegetation cover and water quality conditions. Consideration will be given to assemblages associated with slow-flowing and lowland watercourses that may be sensitive to changes in fine sediment deposition,

dissolved oxygen concentrations, nutrient enrichment and hydrological regime.

7.4.28 Review of EA monitoring records identified a number of notable aquatic invertebrate taxa within the wider catchments, including the nationally scarce water beetles *Anacaena limbata* and *Nebrioporus depressus*, the mayfly *Baetis fuscatus*, the water bug *Plea minutissima*, the soldier fly *Oxycera morrisii*, and the crane fly *Tipula melanoceros*. Notable mollusc species recorded include *Gyraulus laevis*, *Segmentina nitida*, *Valvata macrostoma* and *Viviparus contectus*. These records indicate that parts of the wider catchment support aquatic habitats of elevated ecological interest and will inform the baseline characterisation and assessment of potential effects on macroinvertebrate communities.

7.4.29 Macroinvertebrate monitoring highlights the presence of notable and protected taxa from a range of taxon groups within the study areas (Table 7-10).

Table 7-10: Notable, Protected and Non-Native Species Recorded during EA Aquatic Ecology Monitoring events within 2km of Crossing Locations and 5km of Abstraction/Discharge Locations F - False T - True

| Taxon Group                  | Preferred Name                             | Non-Native | Protected Taxa | Suffolk Coastal | Waveney |
|------------------------------|--------------------------------------------|------------|----------------|-----------------|---------|
| Bird                         | <i>Alcedo atthis</i>                       | F          | T              | 1               |         |
| Bony fish (Actinopterygii)   | <i>Cottus gobio</i>                        | F          | T              |                 | 18      |
| Crustacean                   | <i>Crangonyx pseudogracilis</i>            | T          | F              | 2               | 2       |
|                              | <i>Crangonyx pseudogracilis/floridanus</i> | T          | F              | 8               | 20      |
| Flowering plant              | <i>Elodea</i>                              | T          | F              |                 | 1       |
|                              | <i>Elodea canadensis</i>                   | T          | F              |                 | 3       |
|                              | <i>Groenlandia densa</i>                   | F          | T              |                 | 1       |
|                              | <i>Impatiens glandulifera</i>              | T          | F              | 18              |         |
|                              | <i>Lemna minuta</i>                        | T          | F              |                 | 1       |
| Insect - beetle (Coleoptera) | <i>Anacaena limbata</i>                    | F          | T              | 3               | 1       |
|                              | <i>Nebrioporus depressus</i>               | F          | T              | 9               | 27      |

| Taxon Group                     | Preferred Name                            | Non-Native | Protected Taxa | Suffolk Coastal | Waveney |
|---------------------------------|-------------------------------------------|------------|----------------|-----------------|---------|
| Insect - mayfly (Ephemeroptera) | <i>Baetis fuscatus</i>                    | F          | T              |                 | 1       |
| Insect - true bug (Hemiptera)   | <i>Plea minutissima</i>                   | F          | T              | 2               |         |
| Insect - true fly (Diptera)     | <i>Oxycera morrisii</i>                   | F          | T              | 1               |         |
|                                 | <i>Tipula melanoceros</i>                 | F          | T              | 1               |         |
| Mollusc                         | <i>Gyraulus laevis</i>                    | F          | T              |                 | 1       |
|                                 | <i>Potamopyrgus antipodarum</i>           | T          | F              | 14              | 18      |
|                                 | <i>Segmentina nitida</i>                  | F          | T              |                 | 1       |
|                                 | <i>Stagnicola palustris/fuscus/corvus</i> | F          | T              | 2               | 4       |
|                                 | <i>Valvata macrostoma</i>                 | F          | T              |                 | 5       |
|                                 | <i>Viviparus contectus</i>                | F          | T              |                 | 1       |

## INNS

- 7.4.1 Records obtained from the EA Ecology and Fish Data Explorer identified several INNS within the wider operational catchments (Table 7-9). These include Himalayan balsam *Impatiens glandulifera*, Canadian waterweed *Elodea canadensis*, least duckweed *Lemna minuta*, New Zealand mud snail *Potamopyrgus antipodarum* and the amphipod *Crangonyx pseudogracilis*. These species are commonly associated with lowland rivers, drainage ditches and disturbed riparian habitats and indicate that INNS are established within parts of the River Waveney and Suffolk Coastal catchments.
- 7.4.2 The presence of INNS will be considered within the freshwater biodiversity assessment, particularly in relation to the potential for accidental spread during construction activities. Potential pathways include vegetation clearance, excavation works, movement of soils and sediments, temporary drainage activities and transfer of plant and equipment between watercourses. Appropriate biosecurity procedures and pollution prevention measures will be incorporated into construction phase planning, where required.

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## Macrophytes and Phytobenthos

- 7.4.3 The study area includes a diverse range of aquatic habitat types capable of supporting macrophyte and phytobenthic communities, including lowland rivers, drainage ditches, floodplain channels, wet dykes and ponded water bodies. Several designated sites within the wider study area, including the Broadland wetland system, are recognised for their aquatic plant communities and associated wetland vegetation assemblages.
- 7.4.4 Existing EA macrophyte and diatom monitoring data are available for watercourses within the River Waveney catchment and will be reviewed to inform baseline characterisation and the WFD Compliance Assessment. Available records indicate the presence of notable aquatic plant species, including opposite-leaved pondweed *Groenlandia densa*. Macrophyte and phytobenthic communities will be considered in relation to potential changes in flow regime, nutrient concentrations, sediment deposition, shading, salinity and hydrological connectivity associated with the Proposed Development.

## 7.5 Likely Significant Effects

- 7.5.1 The identification of potential likely significant effects has been informed by a pathway-based understanding of how the Proposed Development could interact with freshwater habitats and species. As set out in the CIEEM Guidelines, impacts can be either direct or indirect:
- A direct impact is considered to be a direct/ immediate consequence of the Proposed Development, or particular activity, without any intervening steps. In this instance this is a physical loss or gain of a habitat, or direct mortality/ damage of an individual, or species population.
  - An indirect impact is considered to be an impact on one individual, population, or habitat arising from an impact on an intermediary or as a result of an impact pathway.
- 7.5.2 Potential impact pathways from the Proposed Development which have been identified at this scoping stage include:
- Temporary disturbance to river channels and riparian habitats during pipeline construction and watercourse crossings.

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- Sediment mobilisation or pollution incidents affecting water quality.
  - Changes to hydrology and flow regime associated with discharge or construction activities.
  - Temporary barriers or disturbance affecting fish movement or spawning behaviour.
  - Introduction or spread of INNS through construction and maintenance activities, and the transfer of aquatic organisms or viable propagules [7] between source and receiving catchments through operational water transfers.
- 7.5.3 Creation, restoration or enhancement of river, ditch and riparian habitats, including habitat reinstatement and measures delivered through BNG, with potential beneficial effects on habitat condition, ecological connectivity and aquatic communities.
- 7.5.4 Whether an impact pathway has the potential to result in a likely significant effect will depend upon a range of factors such as:
- The nature and scale of the Proposed Development.
  - The linear character of the pipeline infrastructure.
  - The proximity of watercourse crossings and discharge infrastructure to sensitive receptors.
  - Hydrological connectivity between the Proposed Development and downstream designated sites and aquatic habitats.
- 7.5.5 These pathways have been identified where there is a realistic mechanism for the Proposed Development's construction, operational or decommissioning phase activities to interact with freshwater biodiversity receptors either directly or indirectly.
- 7.5.6 Impacts may be either permanent (e.g. loss of a habitat during construction of permanent infrastructure), or temporary. Temporary impacts may be either:
- Short-term e.g. associated with temporary construction activities.
  - Medium-term e.g. loss of a hedgerow which is subsequently reinstated.
  - Long-term e.g. where operational activities or persistent environmental changes alter habitat conditions or species assemblages.
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- 7.5.7 The likelihood for such effects to be significant is influenced by receptor sensitivity, hydrological connectivity, the spatial extent of affected habitats and the duration and timing of the impact.
- 7.5.8 Short-term effects are expected to arise primarily during construction and may include temporary habitat disturbance, sediment mobilisation and short-term disruption to fish movement. While generally reversible, such effects may nonetheless be ecologically significant where sensitive receptors are present, for example, where temporary barriers affect migratory fish movements during key migration periods. Given the number of proposed watercourse crossings associated with the Proposed Development's pipeline components, temporary effects may occur at multiple locations across connected catchments.
- 7.5.9 Longer-term ecological effects may arise where operational activities alter water quality, flow regime or habitat conditions over extended periods. These effects could influence aquatic community composition or habitat suitability downstream of discharge locations or within hydrologically connected water bodies. This is particularly relevant where discharge, abstraction or altered hydraulic conditions may influence downstream lowland river, ditch and wetland habitats.
- 7.5.10 Due to the hydrological connectivity of the River Waveney catchment, potential effects may extend beyond the immediate footprint of the Proposed Development to downstream water bodies and designated sites with freshwater qualifying features, including The Broads SAC. At this early design stage of the Proposed Development, effects on hydrologically connected designated sites cannot be excluded where plausible hydrological, hydrogeological, water quality or ecological pathways may exist. The nature and significance of any effects will be assessed through the EIA, WFD and Habitats Regulations Assessment [8] ('HRA') processes as further design information becomes available.
- 7.5.11 Taking into account the impact pathways described above, the likely significant effects that may occur during the construction, operational and
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decommissioning phases of the Proposed Development, in the absence of mitigation, are set out in the sections below.

### Construction Phase

- 7.5.12 Construction activities associated with pipeline installation and watercourse crossings are expected to generate predominantly short-term disturbances to freshwater habitats and species. However, certain construction effects may be significant where sensitive receptors are present or where disturbance occurs during ecologically important periods. Construction effects are anticipated to be associated primarily with pipeline installation, watercourse crossings, temporary dewatering activities and associated riparian working areas.
- 7.5.13 Potential effects may arise either directly through physical disturbance to habitats and species, or indirectly through changes to water quality, hydrology or habitat connectivity. Potential construction effects include:
- Direct and indirect impacts to designated sites and/or their interest features (including international sites, SSSIs and non-statutory sites) through loss of, or damage to, habitats, increase in deposition of pollutants (e.g. from vehicles), changes to hydrology, and disturbance of qualifying species.
  - Temporary loss or degradation of riparian and freshwater habitats.
  - Deterioration in water quality arising from sediment mobilisation, accidental spills or concrete contamination.
  - Localised hydrological changes associated with temporary flow diversion or dewatering.
  - Disturbance to freshwater species during construction activities.
  - Temporary obstruction or disturbance to fish movement during in-channel works.
  - Spread of INNS through movement of equipment or disturbance of substrates.

### Operational Phase

- 7.5.14 Operational effects are primarily associated with discharge from the proposed AWRP to the River Waveney and with potential changes to flow regime within receiving water bodies. Operational effects are anticipated to

be predominantly indirect in nature, arising through changes to water quality, flow characteristics and aquatic habitat conditions.

- 7.5.15 In line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s Nationally Significant Infrastructure Projects (‘NSIPs’): Pre-Application Advice on Environmental Impact Assessment (July 2026) [9] the assessment will adopt a precautionary approach based on ‘*cautious ‘worst case’’* assumptions regarding discharge volumes, water quality parameters and mixing behaviour within the receiving water body. This approach reflects the emerging design of the Proposed Development and the sensitivity of hydrologically connected downstream receptors.
- 7.5.16 The ES will assess discharge scenarios using ‘*cautious ‘worst case’’* assumptions regarding:
- Maximum discharge flow rates.
  - Potential contaminant concentrations within treated effluent.
  - The extent of mixing zones within the receiving watercourse.
- 7.5.17 These assumptions will inform the identification of potential operational phase effects resulting from the Proposed Development and ensure that receptors potentially affected by ‘worst case’ discharge conditions are appropriately scoped into the assessment.
- 7.5.18 Operational phase effects may occur both within the immediate receiving water body and within downstream hydrologically connected habitats and designated sites. Potential operational phase effects include:
- Changes to aquatic community composition resulting from water quality changes associated with the proposed AWRP component’s discharge.
  - Direct impacts through modification of flow regime and water quantity affecting habitat availability.
  - Direct or indirect impacts due to changes to channel morphology and sediment transport processes.
  - Direct or indirect impacts affecting fish populations including migratory species such as eel, lamprey and sea trout.
  - Changes to macroinvertebrate communities resulting from long-term water quality changes.

- Indirect effects on downstream designated sites with hydrological connectivity (for example, The Broads SAC).
- Potential spread of aquatic INNS associated with operational water transfers.

### Decommissioning Phase

- 7.5.19 Decommissioning for the Proposed Development is anticipated for infrastructure to either be left in situ or involve the removal of above-ground infrastructure components (including the proposed AWRP, CSR and WSR). The underground infrastructure including pipeline components are anticipated to be left in situ but could potentially be removed. Effects on freshwater biodiversity receptors are anticipated to be similar in nature to those during construction, although potentially of reduced magnitude if pipelines are left permanently in situ following decommissioning. Potential effects are expected to be localised and temporary, reflecting the reduced scale and duration of decommissioning activities relative to construction.
- 7.5.20 Decommissioning effects are therefore expected to comprise predominantly short-term disturbances associated with removal of infrastructure and reinstatement activities such as:
- Direct and indirect impacts through temporary disturbance to riparian and freshwater habitats.
  - Direct impacts through sediment mobilisation during infrastructure removal.
  - Removal of above-ground infrastructure.
  - Potential spread of INNS through equipment movement.

## 7.6 Impacts Scoped Out of the Assessment

- 7.6.1 Potential impacts are proposed to be scoped out of the assessment where there is no realistic impact pathway linking activities associated with the Proposed Development to freshwater biodiversity receptors, or where effects would clearly be negligible.
- 7.6.2 The following potential impacts are proposed to be scoped out of the assessment in the ES:

- 
- Pre-construction ecological mitigation, including advance habitat creation, protective fencing or temporary barriers installed to protect freshwater ecological interests, as identified in chapter 3 EIA methodology.
  - Freshwater biodiversity surveys and monitoring, including habitat surveys, fish habitat assessments and surveys of fish, macroinvertebrates, macrophytes, phytobenthos and INNS, as identified in chapter 3 EIA methodology.
  - Potential impacts on freshwater biodiversity receptors beyond the specified study areas where there is no realistic hydrological, hydrogeological or ecological pathway. The study areas have been developed to identify receptors that may be directly or indirectly affected by the Proposed Development and will be extended where hydrological, water quality, geomorphological or ecological evidence identifies a wider Zol. Beyond these study areas, potential effects are unlikely to be significant.
  - Potential impacts on designated sites located beyond the defined study areas where no impact pathway is evident, including the absence of hydrological or hydrogeological connectivity, downstream water quality effects, effects on supporting aquatic habitats, or connectivity for relevant mobile species. While such sites may be sensitive, spatial separation and the absence of a credible pathway would mean that there is no mechanism for significant effects arising from the Proposed Development.
  - Potential impacts on watercourses, waterbodies and associated freshwater habitats that have no direct or indirect interaction with the Proposed Development. This includes receptors located outside the predicted Zol and which are not connected to the Proposed Development through surface water, groundwater, floodplain, drainage or ecological pathways.
  - Potential impacts on freshwater biodiversity receptors that are not considered to be important ecological features. To determine whether a significant ecological effect could occur, the ES will identify whether a freshwater biodiversity receptor is sufficiently important for an effect upon it to be material to decision-making. This assessment will follow the CIEEM Guidelines and will evaluate the importance of freshwater biodiversity receptors with reference to an appropriate geographical framework.
  - Effects on WFD water bodies as standalone ecological receptors. Effects on relevant biological quality elements, including fish, macroinvertebrates, macrophytes and phytobenthos, will remain within the scope of the freshwater biodiversity chapter of the ES. Water body-level effects and compliance with WFD objectives will be assessed within the water environment chapter of the ES and the standalone WFD Compliance Assessment.
  - Potential impacts on semi-aquatic mammals, amphibians and other species that may use freshwater habitats but are not dependent on
-

aquatic environments for all or critical stages of their life cycle. These receptors are assessed within chapter 6 terrestrial biodiversity. The freshwater biodiversity chapter of the ES will nevertheless assess effects on the aquatic habitats, hydrology and water quality upon which those species may depend.

- Operational effects associated with buried pipeline and distribution main sections where there would be no routine interaction with a watercourse or freshwater habitat. Effects resulting from construction, maintenance, washout, emergency discharge and INNS pathways will remain scoped in, where relevant.

7.6.3 In line with the approach set out in chapter 3 EIA methodology, for each potential impact scoped out, the supporting justification for proposing to omit an assessment of the impacts identified in paragraph 7.6.2 from the ES has been based on consideration of:

- The absence of realistic impact pathways.
- The sensitivity and conservation importance of receptors.
- The geographic scale of potential effects.
- The duration, timing and reversibility of potential effects.
- The potential for cumulative and combined effects.

7.6.4 Where uncertainty exists regarding potential impact pathways or receptor sensitivity, impacts have been proposed to be scoped into the assessment in the ES on a precautionary basis. Further freshwater biodiversity receptors or impact pathways may be scoped out of the assessment for some or all components of the Proposed Development as survey data are collected, modelling is completed and the understanding of potential effects is refined. Any such scoping decisions will be supported by receptor- and pathway-specific justification, such that the assessment focuses on potential impacts that could result in likely significant effects on freshwater biodiversity.

7.6.5 Only impacts arising from the Proposed Development that are not predicted to result in likely significant effects, prior to the implementation of any additional mitigation measures, are proposed to be scoped out of the assessment in the ES. Potential impacts with a realistic pathway to significant effects will remain scoped into the assessment and will be evaluated in accordance with the EIA Regulations.

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## 7.7 Proposed Approach to Mitigation

- 7.7.1 A hierarchical approach to mitigation is being adopted through the design process which seeks to avoid adverse impacts in the first instance through an iterative approach to the emerging design of the Proposed Development, e.g. avoiding the inclusion of sensitive freshwater biodiversity receptors within the Order Limits, where possible. In areas where avoidance is not possible, measures will be proposed to prevent or reduce potentially significant negative effects. Measures to compensate negative effects may also be required, e.g. habitat creation to offset impacts associated with habitat loss and fragmentation, where these cannot be avoided. This approach is cognisant of the mitigation hierarchy considerations under the National Policy Statement for Water Resources Infrastructure (2023) [10] ('NPSWRI') and the need to consider and demonstrate consideration of the mitigation hierarchy with respect to the anticipated mandatory requirement for the Proposed Development to deliver BNG, although this chapter will focus on the watercourse metric only.
- 7.7.2 It is important to note that outline mitigation measures described below should be treated as preliminary and will be reviewed and developed as the design evolves and further survey data is available. A preliminary summary of mitigation measures is provided below.
- 7.7.3 Primary, secondary and tertiary mitigation relevant to freshwater biodiversity effects would include, but are not limited to, the following measures.

### Primary (Inherent) Mitigation

- Avoidance of high-value freshwater habitats where practicable.
- The use of trenchless crossing techniques (e.g. horizontal directional drilling) for major watercourses.
- Design of fish-friendly intake and discharge structures.

### Secondary (Foreseeable) Mitigation

- Sediment control measures.
- Pollution prevention and spill response measures.
- Implementation of environmental management plans including:



- Outline Construction Environmental Management Plan ('OCEMP').
  - Outline Landscape and Environmental Management Plan ('OLEMP').
  - Outline Decommissioning Environmental Management Plan ('ODEMP').
- Timing restrictions to avoid sensitive ecological periods.
  - Habitat reinstatement following construction.

### **Tertiary (Inexorable) Mitigation**

- Compliance with pollution prevention guidance.
- Biosecurity protocols to prevent the spread of INNS.
- Measures required by wildlife legislation or regulatory compliance.

## **7.8 Proposed Approach to the ES**

### **Best Practice Guidance**

- 7.8.1 The assessment of effects on freshwater biodiversity receptors will follow the standard industry approach as set out in the CIEEM Guidelines. The assessment will also have regard to WFD technical guidance (the UK Technical Advisory Group on the Water Framework Directive's River Assessment Method Macrophytes and Phytobenthos (2014)) [11] relating to BQEs, including on fish, macroinvertebrates, macrophytes and phytobenthos, where relevant.

### **Assessment Methodology**

- 7.8.2 This section sets out the proposed methodology for the assessment of likely significant effects on freshwater biodiversity in the ES. The approach is based on professional judgement, previous experience with similar water resources infrastructure projects, and the guidance outlined above. The assessment will be undertaken in accordance with the CIEEM Guidelines.
- 7.8.3 Baseline conditions will be established through an ongoing desk-based study and field surveys undertaken between 2024 and 2027, as set out in Section 7.4 above.



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- 7.8.4 In accordance with chapter 3 EIA methodology, the ES will describe the future baseline in the absence of the Proposed Development where freshwater ecological conditions are reasonably expected to change. This will consider, where supported by sufficient evidence, the expected trajectory of WFD and River Basin Management Plan ('RBMP') objectives and measures, planned river restoration or catchment management activities, and climate-related changes to flow, water quality and habitat condition. Uncertainty in the future baseline will be clearly stated, and a precautionary approach will be adopted where necessary.
- 7.8.5 The ES will present an assessment of likely significant effects on important ecological features, and as such, does not require consideration of effects on every species or habitat that may be present. To determine whether there are likely to be significant effects, it is first necessary to identify whether an ecological feature is 'important', and therefore whether an effect upon it could be significant and material to decision-making.
- 7.8.6 The freshwater biodiversity chapter of the ES will assess effects on important ecological features with regard to the positive (beneficial) or negative (adverse) nature, extent, magnitude, duration, timing, frequency, and reversibility of the impacts. For each ecological feature identified as being important, relevant impacts will be characterised, effects defined (in light of any primary or tertiary ecological mitigation) and their significance assessed, secondary mitigation identified (where required) and residual effects will be reported.
- 7.8.7 The terms 'impact' and 'effect' are often used synonymously, and this can lead to confusion. For the purposes of the freshwater biodiversity chapter of the ES, they will be defined as follows, in accordance with the CIEEM Guidelines:
- Impacts: Actions resulting in changes to an ecological feature. For example, sediment mobilisation during pipeline construction affecting a river reach.
-

- Effects: Outcome to an ecological feature from an impact. For example, the effects on a macroinvertebrate community from smothering by sediment deposited during construction.

## Sensitivity of Receptors

- 7.8.8 In accordance with the CIEEM Guidelines for Ecological Impact Assessment, the freshwater biodiversity assessment adopts a topic-specific approach to characterising ecological receptors. Rather than applying the generic receptor sensitivity categories set out in chapter 3 EIA methodology, ecological features will first be assigned an ecological importance with reference to their conservation value and geographical context. This approach reflects established ecological assessment practice and provides the basis for determining the significance of effects on freshwater biodiversity receptors. The resulting ecological importance categories are broadly aligned with the overarching concept of receptor sensitivity described in chapter 3 EIA methodology.
- 7.8.9 The ecological importance of each ecological feature within the study areas will be determined having regard to a number of contributory factors relating to conservation value. These include designation and legislative protection, biodiversity value, potential value and secondary/supporting value (e.g. rarity, function within the ecosystem, population trends). Consideration of ecological features having regard to these factors allows their importance to be determined, with reference to the geographic context set out in Table 7-11 below.

Table 7-11: Levels of Ecological Importance and Description/Rationale

| Ecological Importance                 | Description/ Rationale                                                                                                                                                                                    |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| International (European or Worldwide) | The highest level of importance assigned to features which may be designated at an international level (such as SACs or SPAs), or internationally important habitats, species, or assemblages of species. |
| National (England)                    | Assigned to features which may be designated at a national level (such as SSSIs), or nationally important habitats, species, or assemblages of species.                                                   |
| Regional (East of England)            | Features which are considered to be important at a regional level.                                                                                                                                        |

| Ecological Importance                   | Description/ Rationale                                                                                                                                                                          |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| County (Suffolk or Norfolk)             | Features which may be designated at a county level (such as a CWS), or habitats, species, or assemblages of species considered to be of importance at a county level.                           |
| Local (within the local authority area) | Features which do not meet the threshold for county importance, but which are considered to be important at a local level, such as a small area of woodland, or a population of scarce species. |
| Less than Local                         | Habitats, species, or assemblages of species which are common or widespread in the area.                                                                                                        |

7.8.10 For the purposes of the assessment, any ecological feature of local importance or above will be considered an ‘important ecological feature’ and taken forward for assessment. Features of less than local importance will not be considered ‘important ecological features’ and will be scoped out of any further assessment. Where protected species (of less than 'local' importance) are nonetheless present, measures to enable compliance with relevant wildlife legislation and policy will be considered in the freshwater biodiversity chapter of the ES.

### Impact Magnitude

7.8.11 The magnitude of an impact reflects the degree of change to an ecological receptor arising from the Proposed Development and is assessed independently of the ecological importance assigned to that receptor. Magnitude will be assessed on a scale from very low to high (Table 7-12).

7.8.12 Magnitude will be determined, where possible, using a quantified approach (e.g. extent of habitat affected, changes in community composition, or changes in WFD status), supported by professional judgement and consultation with relevant specialists.

Table 7-12: Impact Magnitude Criteria for Freshwater Biodiversity Receptors

| Magnitude | Definition                                                                                                                    |
|-----------|-------------------------------------------------------------------------------------------------------------------------------|
| High      | Total loss or major/substantial alteration to key elements/features of the baseline conditions such that the post development |

| Magnitude | Definition                                                                                                                                                                                                                       |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | character/composition/attributes will be fundamentally changed.                                                                                                                                                                  |
| Medium    | Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.                                       |
| Low       | A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes will be similar to the baseline condition. |
| Very Low  | Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.                                                                                                            |

7.8.13 Magnitude will be determined through:

- Analysis of baseline survey data (extent of habitat, population size, community diversity).
- Desktop review of relevant guidance (e.g., WFD assessment criteria, fish passage standards).
- Professional experience and expert judgement.
- Liaison with specialists in related disciplines (hydrology, water quality, construction engineering).

### Effect Significance

7.8.14 The nature and extent of impacts will be informed by other assessments reported within the ES (including hydrology, water quality and geomorphology). The predicted impacts may be direct or indirect and may occur during construction, operational or decommissioning phases of the Proposed Development. The determination and description of the significance of the predicted ecological effects will be undertaken in accordance with the CIEEM Guidelines along with professional judgement. When considering the likely significant effects, the following characteristics will be considered:

- The positive (beneficial) or negative (adverse) nature.
- Probability.
- Extent.

- Magnitude.
- Duration.
- Frequency and timing.
- Reversibility of the impacts assessed.

- 7.8.15 The assessment will consider the interaction between Proposed Development activities, identified impact pathways, the ecological importance of freshwater biodiversity receptors and the magnitude of predicted impacts. In accordance with the CIEEM Guidelines, the significance of an effect will be determined using professional judgement, taking account of whether the effect supports or undermines the conservation objectives of an important ecological feature or biodiversity more generally. Accordingly, this chapter will not assign effects to the generic Major, Moderate, Minor or Negligible significance categories described in chapter 3. Instead, effects will be reported as either significant or not significant in EIA terms, with this discipline-specific approach representing a justified departure from the generic methodology.
- 7.8.16 The assessment may also be informed by the conservation objectives of the affected ecological feature (for example, conservation objectives for international sites or objectives set out in relevant habitat or species action plans). The ‘conservation status’ or the degree to which a feature is exhibiting ‘integrity’ in terms of its structure, function and condition will also be taken into account.
- 7.8.17 The assessment will also consider the influence of existing trends and pressures (both natural and anthropogenic) on the baseline condition of ecological features. This will ensure that the contribution of the Proposed Development to any ongoing change is appropriately understood, including where effects that may otherwise be considered minor could contribute to a significant cumulative effect. Consideration will be given to cumulative pressures affecting hydrologically connected lowland river, ditch and wetland systems.

- 7.8.18 An effect may be significant at the same geographic scale at which the feature is considered important, or at a lower geographic scale, depending on the nature of the impact.

### Mitigation and Residual Effects

- 7.8.19 The CIEEM Guidelines state that *‘a sequential process should be adopted to avoid, mitigate and compensate negative ecological impacts and effects’*. This is often referred to as the ‘Mitigation Hierarchy’ which is also supported by the NPSWRI and the National Planning Policy Framework (‘NPPF’) [12]. As set out in Section 7.7 above, the freshwater biodiversity chapter of the ES will take into account primary and tertiary ecological mitigation. Where potential effects arise, secondary mitigation will be described. Residual effects will be those that remain after the implementation of mitigation measures.
- 7.8.20 Construction activities with the potential to interact with freshwater habitats will be undertaken in accordance with an Invasive Non-Native Species (‘INNS’) Biosecurity Protocol. The protocol will include measures to prevent the introduction and spread of INNS between watercourses and waterbodies, including inspection and decontamination of personnel, vehicles, plant and equipment, appropriate management of soils and vegetation, and adherence to the Non-native Species Secretariat (‘NNSS’) [13] Check, Clean, Dry guidance.

### In-combination Effects

- 7.8.21 The assessment in the freshwater biodiversity chapter of the ES will consider in-combination effects where impacts from multiple aspects of the Proposed Development interact to produce greater effects on freshwater biodiversity receptors. Potential in-combination effects include:
- Sedimentation combined with flow changes.
  - Water quality changes combined with reduced dissolved oxygen.
  - Habitat loss combined with disturbance.
  - Barriers to fish movement combined with downstream habitat degradation.

- 7.8.22 These will be assessed for each important ecological feature, with mitigation designed to address combined pressures.
- 7.8.23 In-combination effects will be assessed for each important ecological feature, with mitigation designed to address the combined pressure rather than individual impacts in isolation.
- 7.8.24 As set out in chapter 3 EIA methodology, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within the cumulative effects assessment chapter of the ES.
- 7.8.25 A separate in-combination assessment in relation to international sites will also be set out within a separate HRA for the Proposed Development and submitted as part of the ES.

### Limitations and Assumptions

- 7.8.26 The following limitations and assumptions have been identified in relation to the assessment of potentially significant effects on freshwater biodiversity receptors.
- For some receptors, surveys may not cover the full study areas but will instead be targeted to watercourses, water bodies, habitats and locations where there is ecological and hydrological justification to do so. This approach reflects the need to focus survey effort on those areas with potential to support important ecological features and/or where likely impact pathways may arise. Any such limitations in survey coverage will be clearly described in the relevant baseline reports and taken into account in the assessment.
  - The study area for each receptor will be reviewed as the design evolves, and more information becomes available through consultation, desk-based study review and field surveys.
  - Whilst the Applicant will seek to gain access to third-party land within the study areas for the purpose of field surveys, this may not be possible for all areas. As such, the geographical extent of field surveys may differ from that stated in Section 7.2. Any such limitations, and how these have been addressed or taken into account, will be described clearly within the freshwater biodiversity chapter of the ES.
  - Field survey requirements within this secondary study area will be informed by the predicted extent of hydrological and water quality effects and will be refined through consultation with the EA.



- Existing data sources, including EA datasets and other baseline information, provide a useful evidence base for understanding the distribution and condition of freshwater receptors within the study areas. However, such datasets vary in age, spatial coverage and resolution, and may not fully reflect current site conditions. They will therefore be used to inform the assessment but will not be relied upon in isolation and will be supplemented by project-specific survey data where required.
- Ecological surveys are inherently constrained by factors such as survey timing, seasonal variation, hydrological conditions, species life cycles, detectability, and access. The surveys undertaken to support the assessment may not therefore identify all habitats, communities or species present at all times. Absence of evidence will not be assumed to represent evidence of absence, and professional judgement will be applied in considering likely presence where appropriate.
- Design parameters relevant to freshwater biodiversity, including discharge characteristics, flow regime, outfall design, crossing methods and construction techniques, will continue to be refined as the Proposed Development evolves. The assessment will therefore be undertaken on the basis of the maximum design parameters and a precautionary worst-case scenario.
- The assessment of likely significant effects in the freshwater biodiversity chapter of the ES will assess the maximum parameters and 'worst case' in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning Inspectorate's NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026).

7.8.27 Any use of artificial intelligence ('AI') tools to support the drafting or review of this chapter has been undertaken in accordance with the approach described in chapter 3 EIA methodology. AI tools have not been used as a substitute for professional judgement or to generate the underlying baseline datasets. All AI-assisted content has been checked and verified by appropriately qualified specialists, who retain responsibility for the accuracy and completeness of the chapter.

### Freshwater and Marine Interface

7.8.28 The freshwater biodiversity and marine biodiversity chapters should be read in conjunction with Section 7.8 (specifically the freshwater and marine interface), which defines the boundary between freshwater, transitional and marine assessments and the allocation of aquatic receptors between the respective ES chapters.



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- 7.8.29 The freshwater biodiversity chapter of the ES will assess inland watercourses, rivers and water bodies within the study areas, including freshwater reaches upstream of saline influence and those transitional waters where freshwater influence remains substantial and freshwater or estuarine communities are a relevant component of the receiving environment.
- 7.8.30 This will include the River Waveney from the Proposed Development's AWRP discharge point downstream to the defined saline limit, including assessment of freshwater and transitional water habitats and communities where freshwater influence remains substantial and freshwater or estuarine receptors are relevant to the assessment.
- 7.8.31 The marine biodiversity chapter of the ES will assess marine receptors associated with the proposed discharge of concentrated residual water to the marine environment, including marine and coastal waters potentially affected by either a proposed LSO at Hopton-on-Sea (Option 1), or a connection to the existing Anglian Water outfall network at the existing Lowestoft Water Recycling Centre (Option 2), or a connection to the existing Ness Point outfall structure (Option 3). The assessment will also include outer estuarine waters of the River Waveney estuary beyond the saline limit, where marine conditions and marine-dominated biological communities predominate.
- 7.8.32 The saline limit will represent the downstream boundary of the freshwater biodiversity assessment and the upstream boundary of the marine biodiversity assessment. It will be defined with reference to EA WFD transitional and coastal water body boundaries, together with the upstream extent of marine-dominated biological assemblages.
- 7.8.33 This delineation will ensure comprehensive coverage of aquatic receptors whilst avoiding unnecessary duplication between the freshwater biodiversity and marine biodiversity chapters of the ES. Where the position of the saline limit varies seasonally or in response to tidal or flow conditions, the
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assessment envelope will capture the full range of potential saline intrusion to ensure a precautionary worst-case approach.

### WFD Assessment

7.8.34 A standalone WFD compliance assessment will be submitted as part of the DCO application, to:

- Assess potential for deterioration.
- Determine effects on WFD biological, chemical and hydromorphological quality elements.
- Confirm compliance with RBMP objectives.
- Identify mitigation to ensure no deterioration.

7.8.35 Further details are provided in chapter 9 water environment of this Scoping Report.

### HRA

7.8.36 A separate HRA under the requirements of The Conservation of Habitats and Species Regulations 2017 (as amended) will be undertaken to assess any likely significant effects resulting from the Proposed Development. NE, the EA, and the Marine Management Organisation will be consulted with respect to the proposed approach to, and findings of, the HRA. The HRA will be undertaken in line with the Planning Inspectorate's NSIPs: Advice on Habitats Regulations Assessments (the 'HRA guidance') [14].

7.8.37 The following sites will be included within the HRA:

- SACs.
- SPAs.
- Proposed SACs.
- Proposed SPAs.
- Ramsar sites (both listed and proposed).
- Sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential SPAs, possible SACs.

7.8.38 The HRA guidance sets out a three-stage approach to undertaking an HRA and emphasises the iterative nature of the process.

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### Stage 1: Screening

- 7.8.39 The Screening stage involves the determination of the international sites which could potentially be affected by a proposed development and their determining interests; and whether the proposed development could result in a likely significant effect, either alone or 'in-combination' with other plans and projects.

### Stage 2: Appropriate Assessment

- 7.8.40 In the event that likely significant effects are identified at the Screening stage (in the absence of mitigation/avoidance measures), on the basis of objective information, the competent authority should proceed to the next stage of assessment. During Stage 2 (Appropriate Assessment), an assessment of whether there would be an adverse effect on the integrity of the international site concerned, and the consideration of measures to address this effect, is required. The precautionary principle should be applied, with the focus being on objectively demonstrating, with supporting evidence, that there will be no adverse effects on the integrity of the international site. Where this is not possible, adverse effects must be assumed.
- 7.8.41 Where appropriate measures can be put in place and the competent authority considers that the proposed development will not adversely affect the integrity of the international site, consent can be granted.
- 7.8.42 Where it is not possible to identify suitable measures to address the identified likely significant effects, or uncertainty remains, consideration of Stage 3 (Derogations) is required.

### Stage 3: Derogations

- 7.8.43 Stage 3 (Derogations) includes the following three tests:
- Assessment of alternative solutions.
  - Consideration of imperative reasons of overriding public interest ('IROPI').
  - Compensatory measures.

- 7.8.44 The assessment should identify and assess alternatives that have been considered. Alternative solutions could include a proposed development of a different scale, a different location, and an option of not having the proposed development at all (the 'do nothing' approach).
- 7.8.45 Where it can be demonstrated that there are no alternative solutions to the proposed development, that would have a lesser effect or avoid an adverse effect on the integrity of the international site, the proposed development may still be carried out if the competent authority is satisfied that it must be carried out for IROPI and that sufficient compensation measures have been provided.

## **7.9 Summary of Impacts and Effects**

- 7.9.1 Table 7-13 provides a summary of the freshwater biodiversity receptors, potentially significant effects, anticipated magnitude, ecological importance, significance and whether the receptor/effect is scoped in or out of the freshwater biodiversity ES chapter for the construction, operational and decommissioning phases of the Proposed Development.

Table 7-13: Summary of Freshwater Biodiversity

| Receptor                                                                                                                                       | Effects                                                                                                                                                                                                                                                                                                                                                                                           | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                        | Scoped in/ Scoped out |
|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Construction Phase</b>                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                   |                       |                                     |                                      |                                                                                                                                                                                                                                   |                       |
| Designated sites with freshwater qualifying features, including SACs, Ramsar sites, SSSIs and other hydrologically connected designated sites. | Secondary pathway/ precautionary inclusion: Changes to water quality, hydrology, hydrogeology, geomorphology and supporting habitat condition arising from construction activities, watercourse crossings, sediment mobilisation and pollution incidents. Effects are retained on a precautionary basis where hydrological or ecological connectivity to designated sites cannot yet be excluded. | Medium                | Up to International                 | Significant                          | Construction Environmental Management Plan in accordance with the OCEMP; pollution prevention measures; sensitive crossing design; hydrogeological assessment; sediment control measures; and embedded mitigation through design. | Scoped in             |

| Receptor                                                                                                           | Effects                                                                                                                                                                                                                                                                                                                                              | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                        | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Freshwater habitats and WFD water bodies, including rivers, tributaries, ditches, floodplain and wetland habitats. | Key driver: Direct habitat loss, degradation or disturbance associated with watercourse crossings and construction working areas, together with changes to channel morphology and ecological connectivity.<br>Secondary pathway: Effects arising from sediment mobilisation, changes to flow, deterioration in water quality and the spread of INNS. | Medium – High         | Local – County                      | Significant                          | Trenchless crossing techniques where appropriate; minimisation of working areas; habitat reinstatement; sediment control measures; and sensitive working methods. | Scoped in             |
| Fish communities, including migratory and resident fish species.                                                   | Key driver: Temporary barrier effects, habitat disturbance, injury or mortality and disruption to                                                                                                                                                                                                                                                    | Medium                | Local – Regional                    | Significant                          | Timing restrictions; fish rescue where required; maintenance of fish passage; sensitive crossing design; and                                                      | Scoped in             |

| Receptor                                                                         | Effects                                                                                                                                                                                                                        | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                     | Scoped in/ Scoped out |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                                  | spawning or migration during watercourse crossings and in-channel works.<br>Secondary pathway: Effects arising from sedimentation, deterioration in water quality and changes to flow or habitat condition.                    |                       |                                     |                                      | pollution prevention measures.                                                                                                                 |                       |
| Aquatic communities, including macroinvertebrates, macrophytes and phytobenthos. | Secondary pathway: Changes to community composition and habitat suitability resulting from habitat disturbance, sediment deposition, deterioration in water quality, changes to flow and changes to aquatic habitat structure. | Medium                | Local – County                      | Significant                          | Sediment control measures; habitat reinstatement; sensitive crossing techniques; pollution prevention measures; and monitoring where required. | Scoped in             |
| INNS.                                                                            | Secondary pathway: Introduction or                                                                                                                                                                                             | Medium                | Local                               | Significant                          | Implementation of an INNS Biosecurity                                                                                                          | Scoped in             |

| Receptor                                                                                                                                       | Effects                                                                                                                                                                                                                          | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                         | Scoped in/ Scoped out |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                                                                                                | spread of INNS through the movement of equipment, materials, soils, sediments and plant material, and through disturbance of aquatic and riparian habitats during construction.                                                  |                       |                                     |                                      | Protocol and adherence to NNSS Check, Clean, Dry guidance.                                                                                         |                       |
| <b>Operational Phase</b>                                                                                                                       |                                                                                                                                                                                                                                  |                       |                                     |                                      |                                                                                                                                                    |                       |
| Designated sites with freshwater qualifying features, including SACs, Ramsar sites, SSSIs and other hydrologically connected designated sites. | Key driver/ secondary pathway: Changes to supporting hydrology, flow regime, water quality, habitat condition and ecological functioning arising from operational discharge, abstraction and water transfer, including the River | Low – Medium          | Up to International                 | Significant                          | WFD-compliant design and operation; HRA process; discharge optimisation; operational controls; monitoring; and adaptive management where required. | Scoped in             |



| Receptor                                                                                                           | Effects                                                                                                                                                                                                                                                                                                                                          | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                                    | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                                                                    | Waveney discharge-abstraction pathway. Effects are retained where downstream connectivity to designated sites cannot be excluded.                                                                                                                                                                                                                |                       |                                     |                                      |                                                                                                                                                                               |                       |
| Freshwater habitats and WFD water bodies, including rivers, tributaries, ditches, floodplain and wetland habitats. | Key driver: Changes to flow regime, water quality, habitat condition and ecological connectivity arising from operational discharge, abstraction and water-transfer activities. Secondary pathway: Localised effects associated with maintenance, washout or emergency discharges and the spread of INNS. Beneficial effects may also arise from | Low – Medium          | Local – County                      | Significant                          | Discharge optimisation; WFD-compliant operation; habitat restoration and enhancement measures; INNS biosecurity protocol; monitoring; and adaptive management where required. | Scoped in             |

| Receptor                                                         | Effects                                                                                                                                                                                                                                                                                                                                                                              | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                 | Scoped in/ Scoped out |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                  | habitat creation, restoration or enhancement measures.                                                                                                                                                                                                                                                                                                                               |                       |                                     |                                      |                                                                                                                                                            |                       |
| Fish communities, including migratory and resident fish species. | Key driver: Changes to fish habitat suitability, behaviour, passage and population dynamics resulting from alterations to flow regime, water quality and habitat condition associated with discharge, abstraction and water transfer.<br>Secondary pathway: Potential effects arising from entrainment, changes to dissolved oxygen, sediment processes and ecological connectivity. | Low – Medium          | Local – Regional                    | Significant                          | WFD-compliant design and operation; fish-friendly intake and discharge design; discharge optimisation; monitoring; and adaptive management where required. | Scoped in             |

| Receptor                                                                         | Effects                                                                                                                                                                                                                                              | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                         | Scoped in/ Scoped out |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Aquatic communities, including macroinvertebrates, macrophytes and phytobenthos. | Secondary pathway: Changes to community composition, habitat suitability and ecological functioning resulting from alterations to flow regime, nutrient and contaminant concentrations, dissolved oxygen, sediment deposition and habitat condition. | Low – Medium          | Local – County                      | Significant                          | WFD-compliant operation; discharge optimisation; operational water-quality controls; monitoring; and adaptive management where required.                                                           | Scoped in             |
| INNS.                                                                            | Key driver/ precautionary inclusion: Potential movement of aquatic INNS, viable propagules or pathogens between the source and receiving catchments through the operational water-transfer                                                           | Low – Medium          | Local – Regional                    | Significant                          | Assessment of source and receiving catchment INNS records and pathways; treatment and screening barriers; INNS biosecurity protocol; operational controls; monitoring; and contingency or adaptive | Scoped in             |

| Receptor                                                                                                                                       | Effects                                                                                                                                                                                                   | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                                           | Scoped in/ Scoped out |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                                                                                                | pathway, with subsequent establishment or spread within receiving waters. Secondary pathway: Spread during maintenance activities or where operational changes create conditions favouring establishment. |                       |                                     |                                      | management measures where required.                                                                                                                                                  |                       |
| <b>Decommissioning Phase</b>                                                                                                                   |                                                                                                                                                                                                           |                       |                                     |                                      |                                                                                                                                                                                      |                       |
| Designated sites with freshwater qualifying features, including SACs, Ramsar sites, SSSIs and other hydrologically connected designated sites. | Precautionary inclusion/secondary pathway: Effects similar to those arising during construction may occur where infrastructure is removed, including disturbance, sediment mobilisation, changes to       | Low – Medium          | Up to International                 | Significant                          | Decommissioning Environmental Management Plan in accordance with the ODEMP; pollution prevention measures; sediment controls; sensitive working methods; and reinstatement measures. | Scoped in             |

| Receptor                                                                                                           | Effects                                                                                                                                                                                                                                                     | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                     | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                                                                    | hydrology and deterioration in water quality. Effects are retained where connectivity to designated sites cannot be excluded.                                                                                                                               |                       |                                     |                                      |                                                                                                                                                                                                |                       |
| Freshwater habitats and WFD water bodies, including rivers, tributaries, ditches, floodplain and wetland habitats. | Precautionary inclusion: Habitat disturbance, degradation or loss associated with removal of infrastructure and reinstatement activities. Secondary pathway: Changes to flow, sediment mobilisation, deterioration in water quality and the spread of INNS. | Low – Medium          | Local – County                      | Significant                          | Decommissioning Environmental Management Plan in accordance with the ODEMP; habitat restoration; sensitive working methods; sediment and pollution controls; and an INNS biosecurity protocol. | Scoped in             |
| Fish communities, including migratory and resident fish species.                                                   | Precautionary inclusion: Disturbance, injury or mortality and temporary barrier                                                                                                                                                                             | Low – Medium          | Local – Regional                    | Significant                          | Decommissioning Environmental Management Plan in accordance with the ODEMP; sensitive                                                                                                          | Scoped in             |

| Receptor                                                                         | Effects                                                                                                                                                                                                                                                          | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                             | Scoped in/ Scoped out |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                                  | effects associated with infrastructure removal. Secondary pathway: Effects arising from sedimentation, deterioration in water quality and temporary changes to flow or habitat condition.                                                                        |                       |                                     |                                      | working methods; timing restrictions where required; pollution prevention measures; fish rescue where required; and habitat restoration and enhancement.                                                               |                       |
| Aquatic communities, including macroinvertebrates, macrophytes and phytobenthos. | Precautionary inclusion/ secondary pathway: Changes to aquatic community composition and habitat suitability arising from habitat disturbance, sediment deposition, deterioration in water quality and temporary changes to habitat condition during removal and | Low – Medium          | Local – County                      | Significant                          | Decommissioning Environmental Management Plan in accordance with the ODEMP; sensitive working methods; sediment and pollution prevention measures; habitat restoration and enhancement; and monitoring where required. | Scoped in             |

| Receptor | Effects                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                              | Scoped in/ Scoped out |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|          | reinstatement activities.                                                                                                                                                                                       |                       |                                     |                                      |                                                                                                                                                         |                       |
| INNS.    | Secondary pathway: Risk of introducing or spreading INNS through the movement of equipment, sediments, soils or plant material and through disturbance of aquatic and riparian habitats during decommissioning. | Low–Medium            | Local                               | Significant                          | Decommissioning Environmental Management Plan in accordance with the ODEMP; INNS biosecurity protocol and adherence to NNSS Check, Clean, Dry guidance. | Scoped in             |

## 8 Marine Biodiversity

### 8.1 Introduction

- 8.1.1 This chapter outlines the proposed scope and methodology for the assessment of the likely significant effects resulting from the construction, operation and decommission of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on marine biodiversity, including designated sites, habitats and notable species. The assessment will be presented within an Environmental Statement (‘ES’) submitted with the application for a Development Consent Order (‘DCO’). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.
- 8.1.2 The assessment will consider whether each of the three options for the long sea outfall (‘LSO’) component of the Proposed Development outlined in chapter 2 the Proposed Development are likely to result in significant effects on marine biodiversity sensitive receptors, including designated sites, marine habitats and protected or notable marine species. This chapter considers marine biodiversity receptors seawards from mean high water springs (‘MHWS’).
- 8.1.3 The marine aspects of the EIA Scoping Area are illustrated on Figure 1-1. This chapter should be read in conjunction with the following chapters of the Scoping Report:
- Chapter 2 The Proposed Development.
  - Chapter 3 EIA Methodology.
  - Chapter 6 Terrestrial Biodiversity.
  - Chapter 7 Freshwater Biodiversity.
  - Chapter 9 Water Environment.
  - Chapter 16 Climate Change.



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- 8.1.4 The assessment will identify and evaluate relevant marine biodiversity receptors (including statutory and non-statutory designations, habitats and protected/notable species) within the EIA Scoping Area and associated with the LSO component of the Proposed Development. It will provide a high-level overview of relevant baseline information currently available and identify where further survey work may be required. It will consider the significant effects that the Proposed Development is likely to have on these receptors during the construction, operational and decommissioning phases.
- 8.1.5 This chapter has been undertaken by a suitably qualified and experienced marine ecologist. The marine ecologist has eight years' experience in ecological and environmental consultancy, including Environmental Impact Assessment and marine ecological surveys, and holds a relevant qualification (BSc) in marine ecology. They are also a Chartered Biologist (CBiol) with the Royal Society of Biology ('RSB').

## 8.2 Study Area

- 8.2.1 The proposed study areas for the assessment have been defined in accordance with the Chartered Institute of Ecology and Environmental Management's ('CIEEM') Guidance for Ecological Impact Assessment in the UK and Ireland Version 1.3 (2018) [1] (the 'CIEEM Guidelines').
- 8.2.2 Appendix 8.1 to this chapter sets out the relevant legislation, policy and guidance relevant to marine biodiversity. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.
- 8.2.3 The CIEEM Guidelines state that all ecological features that occur within the anticipated 'Zone of Influence' ('Zol') for a proposed development should be investigated. The Zol is likely to extend beyond the EIA Scoping Area, due to the hydrological connectivity of the marine environment. The Zol will vary for different ecological features depending on their sensitivity to an environmental change, or the extent of their range. For the Proposed Development, the Zol comprises:
-

- Areas directly within the land take for the Proposed Development.
- Areas which will be temporarily affected during the construction phase and decommissioning phase.
- Areas likely to be impacted by hydrological disruption during the construction, operational and decommissioning phases.
- Areas where there is a risk of pollution, water quality deterioration and noise disturbance during the construction, operational and decommissioning phases.

- 8.2.4 The proposed marine biodiversity study areas include the supralittoral, intertidal and subtidal zones. The EIA Scoping Area extends approximately 1km offshore at Hopton-on-Sea to account for the proposed new LSO (Option 1). The LSO Options 2 and 3 utilise existing Anglian water infrastructure at Ness Point, Lowestoft in the southern North Sea, and the EIA Scoping Area does not extend beyond MHWS at this location. However, the anticipated ZoI is approximately 6km at both locations to account for potential impacts from the discharge of concentrated residual water. The study areas above MHWS are considered in chapter 6 terrestrial biodiversity and chapter 7 freshwater biodiversity of this Scoping Report.
- 8.2.5 The proposed study areas account for both potential direct and indirect effects which may occur during the Proposed Development's construction, operational and decommissioning phases. Direct effects on marine biodiversity are those which occur within the study areas, such as direct disturbance of benthic habitats and associated species as a result of construction and decommissioning activities.
- 8.2.6 Indirect effects are those that result from a direct effect to another receptor, for example, the direct loss of species due to construction activities could have an indirect effect on food availability within the wider food chain.
- 8.2.7 For the desk-based study (which is a collation of existing information relating to marine biodiversity receptors), the proposed study areas for each receptor are outlined in Table 8-1, along with supporting justification.
- 8.2.8 The spatial extent of the marine biodiversity study areas has been defined based on the nature of the Proposed Development, the characteristics of

marine environment and the potential impact pathways by which effects could arise. The terrestrial components of the Proposed Development are not deemed to have a marine impact; the study areas have been determined based on the LSO component of the Proposed Development only. The study area distances were set based on the likely extent of physical disturbances during construction, the modelled dispersion plume of the effluent discharge during operation and the mobility and sensitivity of ecological receptors present. Figure 8-1 shows the LSO EIA Scoping Area for the Proposed Development.

- 8.2.9 For highly mobile species, such as marine mammals, larger study areas have been defined to account for effects that could arise over wider spatial scales. For less mobile and sessile species, a more localised study area based on the anticipated direct physical impact extents are considered sufficient. Study areas may be extended if emerging data shows a wider Zol than is currently anticipated. This approach is consistent with the CIEEM Guidelines and the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) [2].

Table 8-1: Desk-based Study Search Areas

| Marine Sensitive Receptor                                                                                                                                   | Study Area                                                                                                                                                                                      | Justification                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Statutory designated sites of international importance including Ramsar sites, Special Areas of Conservation ('SACs') and Special Protection Areas ('SPAs') | The EIA Scoping Area plus a 10km (hydrologically connected) radius from the EIA Scoping Area (extended to a 30km radius for sites designated for highly mobile species such as marine mammals). | Based on the likely extent of physical disturbances during construction, the modelled dispersion plume of the effluent discharge during operation and the mobility and sensitivity of ecological receptors present (including effects that could arise over wider spatial scales for marine mammals). |
| Statutory designated sites of national importance, including Sites of Special                                                                               | The EIA Scoping Area plus 10km (hydrologically connected only) radius                                                                                                                           | Based on the likely extent of physical disturbances during construction, the                                                                                                                                                                                                                          |

| Marine Sensitive Receptor                                                         | Study Area                                                                                                                                                                                   | Justification                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scientific Interest ('SSSIs') and National Nature Reserves ('NNRs').              | from the EIA Scoping Area.                                                                                                                                                                   | modelled dispersion plume of the effluent discharge during operation and the mobility and sensitivity of ecological receptors present.                                                                                                                                                                |
| Statutory designated sites of county importance (Local Nature Reserves ('LNRs')). | The EIA Scoping Area plus 2km (hydrologically connected) radius from the EIA Scoping Area.                                                                                                   | Based on the likely extent of physical disturbances during construction, the modelled dispersion plume of the effluent discharge during operation and the mobility and sensitivity of ecological receptors present.                                                                                   |
| Non-statutory designated sites of county or local nature conservation importance. | The EIA Scoping Area plus 2km (hydrologically connected) radius from the EIA Scoping Area.                                                                                                   | Based on the likely extent of physical disturbances during construction, the modelled dispersion plume of the effluent discharge during operation and the mobility and sensitivity of ecological receptors present.                                                                                   |
| Protected/notable species and habitats.                                           | The EIA Scoping Area plus 2km (hydrologically connected) radius from the EIA Scoping Area (extended to a 30km radius for sites designated for highly mobile species such as marine mammals). | Based on the likely extent of physical disturbances during construction, the modelled dispersion plume of the effluent discharge during operation and the mobility and sensitivity of ecological receptors present (including effects that could arise over wider spatial scales for marine mammals). |
| Non-designated habitats and species.                                              | The EIA Scoping Area plus 2km (hydrologically connected) radius from the EIA Scoping Area (extended to a 30km radius for sites designated                                                    | Based on the likely extent of physical disturbances during construction, the modelled dispersion plume of the effluent discharge during operation and the mobility and sensitivity of                                                                                                                 |

| Marine Sensitive Receptor | Study Area                                         | Justification                                                                                                   |
|---------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                           | for highly mobile species such as marine mammals). | ecological receptors present (including effects that could arise over wider spatial scales for marine mammals). |

## 8.3 Consultation and Engagement

8.3.1 The Applicant is undertaking ongoing engagement with stakeholders through regular meetings. The following stakeholders have responsibility for aspects of marine biodiversity and will continue to be engaged throughout the EIA process:

- Environment Agency ('EA').
- Great Yarmouth Borough Council ('GYBC').
- East Suffolk Council ('ESC').
- Mid Suffolk District Council ('MSDC').
- South Norfolk District Council ('SNDC').
- Broads Authority ('BA').
- Norfolk County Council ('NCC').
- Suffolk County Council ('SCC').
- Marine Management Organisation ('MMO').
- Natural England ('NE').
- Eastern Inshore Fisheries Conservation Authority ('IFCA').
- Centre for Environment Fisheries and Aquaculture Science ('Cefas').

8.3.2 At a virtual meeting held on 22 January 2026, the marine survey scope and methodologies were presented and discussed with relevant Local Planning Authorities (SCC, NCC, ESC, MSDC, BA and SNDC). A comment was noted to ensure that intertidal specific phase 1 walkover methodologies were followed. Intertidal habitats are discussed in 'Benthic Ecology Habitats', and in response to comments, an extended intertidal walkover survey is planned as part of the surveys to inform the assessment of likely significant effects in the ES.

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- 8.3.3 A further virtual meeting was held on 12 May 2026 with the Local Planning Authorities (SCC, NCC, ESC, MSDC, BA and SNDC) and other stakeholders (the EA and NE) to provide an update on the Biodiversity Data Collection Strategy ('BDCS') (Appendix 6.2) (refer to paragraph 8.3.6 for further details) and the proposed survey programme.
- 8.3.4 During a virtual meeting held on 26 January 2026, the proposed marine survey scope and methodologies were presented and discussed with the MMO. The MMO outlined the requirements for marine licenses and exemptions. The MMO provided no comments on the marine survey scope and methodologies, however, the MMO advised the Applicant to provide a method statement of the planned surveys to Cefas for further comment.
- 8.3.5 During a virtual meeting held on 28 January 2026, the proposed marine survey scope and methodologies were presented and discussed with the EA and NE. The EA and NE provided no comment on the survey scope and methodologies during the meeting.
- 8.3.6 The Applicant has developed a BDCS (Appendix 6.2) which sets out the proposed approach, study area, and timing of the full range of marine biodiversity surveys that will be undertaken to inform the design evolution and assessment of likely significant effects resulting from the Proposed Development.
- 8.3.7 The BDCS was shared with NE and the EA in February 2026. Comments were received from the EA and NE on 26 February 2026, and further comments were received from NE on 11 March 2026. Further information was provided within an updated version of the BDCS on 8 May 2026 to respond to these comments. Comments were provided by NE and the EA on 12 June 2026 on this updated version of the BDCS. Further information was provided within a further updated version of the BDCS on 6 August 2026.
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## 8.4 Baseline Environment

8.4.1 The baseline environment in relation to marine biodiversity within the study areas is summarised below. Relevant parts of the study areas have been characterised following a desk-based study of available data sources as described in Table 8-1, field surveys to further inform the baseline environment will be undertaken during 2026/2027, as detailed in Appendix 6.2.

### Baseline Data Sources

8.4.2 The baseline data for the assessment has been sourced from a range of publicly available datasets. Data not available publicly has been requested from the relevant sources. The sources of baseline data are outlined in Table 8-2.

8.4.3 Data for the assessment has also been sourced from other development projects in the vicinity through a desk-based assessment. These datasets provide an accurate baseline for the study areas ahead of any further surveys anticipated for the Proposed Development. They can be used comparatively with baseline data collected during surveys on this Proposed Development to view habitat change over time and increase robustness and accuracy of the baseline description.

Table 8-2: Baseline Data Sources

| Data Source                                                                                                                             | Contents                                            | Date Data Accessed/Received              |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------------------------|
| Multi Agency Geographic Information for the Countryside ('MAGIC') Maps (Department for Environment, Food & Rural Affairs ('Defra')) [3] | Designated sites and habitats data.                 | 1 June 2026.                             |
| NE                                                                                                                                      | SAC and SSSI designation and condition information. | 1 June 2026.                             |
| Eastern IFCA                                                                                                                            | Annual fish survey data (dates to be confirmed).    | Not yet received at the time of writing. |

| Data Source                                  | Contents                                                                                   | Date Data Accessed/Received              |
|----------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------|
| EA Catchment Data Explorer                   | Transitional water fish, phytoplankton and benthic invertebrate data.                      | 1 June 2026.                             |
| Cefas                                        | Annual plankton and fish survey data (dates to be confirmed).                              | Not yet received at the time of writing. |
| MMO                                          | Fisheries landing statistics.                                                              | 1 June 2026.                             |
| Joint Nature Conservation Committee ('JNCC') | Marine recorder results on benthic data such as species, biotopes and physical attributes. | 1 June 2026.                             |

8.4.4 The following baseline field survey data requirements within the study areas of the LSO component's three Options (comprising a new LSO element proposed for Option 1 and the use of the existing Anglian Water infrastructure for Options 2 and 3, refer to Figure 1-3) have been identified to further inform the baseline:

- Physical, chemical and phytoplankton water quality data around the dispersion array and within the projected dispersion plume (monthly for one year) between 2026 and 2027.

8.4.5 The following baseline field survey data requirements within the study area of the new LSO element proposed for Option 1 only (which would be located in the proposed LSO section of the EIA Scoping Area) have been identified to further inform the baseline:

- Subtidal benthic faunal, particle size and chemical analysis (April - October) in 2027.
- *Sabellaria spinulosa* reef habitat survey (late summer - early autumn, weather dependant) in 2027.
- Walkover and phase 1 habitat mapping of supralittoral and intertidal zone within the EIA Scoping Area (April - October) in 2027.
- Wintering bird surveys (refer to chapter 6 terrestrial biodiversity for further details).



- Geophysical survey (for marine archaeology) to be undertaken and data can be used to help inform this assessment (refer to chapter 12 marine historic environment for further details).

8.4.6 Field surveys are scheduled to be undertaken in 2026/2027. Further details are available in the BDCS (Appendix 6.2).

### Designated Sites

8.4.7 Designated marine sites within the study area as defined in Table 8-1 are summarised in Table 8-3. Figure 8-2 shows the international sites within a 30km radius (marine only).

Table 8-3: Summary of Marine Designated Sites

| Designated Site               | Approximate Distance from EIA Scoping Area (km) | Summary of Qualifying Features                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outer Thames SPA [4]          | EIA Scoping Area (partially within).            | Designated for the protection of wintering red-throated diver ( <i>Gavia stellata</i> ) The site is estimated to support 38% of the wintering population of Great Britain (6,466 individuals). It is also designated for the protection of foraging areas for common tern ( <i>Sterna hirundo</i> ) and little tern ( <i>Sternula albifrons</i> ) during the breeding season (April to August).           |
| Southern North Sea SAC [5]    | EIA Scoping Area (partially within).            | Designated for the protection of harbour porpoise ( <i>Phocoena phocoena</i> ) an Annex II [6] species. The conservation objectives of the site are: to ensure that the harbour porpoise are a viable component of the site; there is no significant disturbance or displacement of the species; and that the condition of supporting habitats and processes, and the availability of prey is maintained. |
| Benacre to Easton Bavents SAC | 8.5km                                           | Designated for the priority feature coastal lagoons (1150 [7]). The lagoons show a range of salinities, supporting specialist lagoonal species.                                                                                                                                                                                                                                                           |

8.4.8 The Outer Thames Estuary SPA was classified by the UK Government to meet obligations set out in the Birds Directive (2009/147/EC) [8] and is

protected by The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) [9].

### Non-Statutory Designations

- 8.4.9 There are no hydrologically connected non-statutory designations within the study areas as defined in Table 8-1.

### Priority Coastal Habitats

- 8.4.10 The following priority coastal habitats are present within the study areas:
- Maritime cliffs and slopes – present between Corton and Gorleston-on-Sea to the north of Lowestoft for approximately 6km. This habitat type overlaps with the EIA Scoping Area at Hopton-on-Sea.
  - Coastal sand dunes – present at Gunton Denes to the north of Lowestoft. This habitat is adjacent to the EIA Scoping Area landwards of MHWS and is not considered further in this chapter (refer to chapter 6 terrestrial biodiversity for further details).
- 8.4.11 The shoreline management plan for ‘Hopton 6.20’ [10], within the study area, shows the 2025 to 2055 and 2055 to 2105 management plan as ‘Hold the line’. The intention of ‘Hold the Line’ is to retain a defence along the current alignment and replace coastal defences when needed.
- 8.4.12 The following coastal impacts are proposed to be scoped into the marine biodiversity chapter of the ES due to potentially significant effects and known coastal erosion pressures in the area [11]:
- Sediment mobilisation.
  - Elevated turbidity.
  - Sediment abrasion.

### Benthic Ecology Habitats (Intertidal and Subtidal)

- 8.4.13 Within the study area, there are intertidal and subtidal benthic habitats. There is limited baseline data available specific to the EIA Scoping Area. However, existing studies describe the Norfolk and Suffolk coast as a shallow shelving seabed, sedimentary in nature with very turbid waters [12]. Previous studies relating to other development projects in the vicinity

suggest the subtidal zone within the study area is predominantly dynamic, sandy habitats with mixed and coarse sediments [13]. The intertidal and subtidal habitats and communities found within the wider Norfolk and Suffolk coastal areas are discussed further in the following sections.

### Intertidal Habitats and Communities

- 8.4.14 MAGIC Map [14] was used to determine the substrate types in the intertidal zone across the study areas. These are predominantly sand and gravel along the coast (Sand, Mud & Mixed (EUNIS [15] classification A2.2, A2.3, A2.4)). EMODnet [16] (European Marine Observation and Data Network) was then used to visualise habitats according to the EUNIS scale. The majority of the coastline has incomplete habitat information available on MAGIC Map, although some areas of muddy sand are present between Gorleston-on-Sea to the north and Lowestoft to the south.
- 8.4.15 Intertidal benthic surveys were undertaken in 2023 as part of the South East Anglia Link project [17] at Aldeburgh (approximately 42km south of the proposed new LSO component (Option 1) of the Proposed Development). The shore to the north of Aldeburgh was part of an exposed shingle beach which extends for over 30km to Lowestoft. The survey area comprised part of this shingle alongside sandy, gravelly patches. This is similar substrate to that on the intertidal zone within the EIA Scoping Area. All core sampling stations collected during this survey at this site were classified as sandy gravel [18]. Only four taxa were recorded at Aldeburgh in core samples: animalia eggs, nematoda, spionidae, and *Eurydice inermis*. Similarly, quadrat sampling only showed two taxa: sea pea (*Lathyrus japonicus*) and sea kale (*Crambe maritima*). Both sea pea and sea kale are protected under the Wildlife & Countryside Act 1981 [19] ('W&C Act 1981') and must not be picked without permission from the landowner. The main biotopes to the north of the survey area, and therefore most similar to that in the EIA Scoping Area, were Atlantic, Baltic and Arctic coastal shingle beach (EUNIS code N21#b) on the upper shore, channel *C. maritima* communities (EUNIS code N215) on the mid shore, and barren littoral shingle on the low shore (EUNIS code MA3211).

- 8.4.16 As noted in Section 8.2, the EIA Scoping Area overlaps with the Outer Thames Estuary SPA [20]. The SPA is confirmed to contain high tidal current streams and a range of mobile intertidal sediments, including several shallow sandbanks. Shallow sandbanks are of particular importance to red-throated divers (*Gavia stellata*) [21]. The sandbanks of the Outer Thames Estuary SPA support the nursery and feeding grounds for many fish species (cod, gobies, sand eels) (refer to 'Fish Ecology' Section for further details), on which the red-throated diver feeds.
- 8.4.17 Benthic ecology surveys were also undertaken as part of the Great Yarmouth Third River Crossing project [22], to the north of the EIA Scoping Area. The findings from the project's surveys suggest the presence of intertidal mudflats at the mouth of the River Yare, exposed at low tide.

#### Subtidal Habitats and Communities

- 8.4.18 MAGIC Map was used to determine the habitat types in the subtidal area of the proposed LSO section of the EIA Scoping Area. This is mainly subtidal sand (sandbanks which are slightly covered by sea water all the time (H1110)), with small areas of subtidal coarse sediment and subtidal mixed sediments. EMODnet was then used to confirm the EUNIS habitats present in the subtidal, which include MC52: Atlantic circalittoral sand, MC62: Atlantic circalittoral mud, and MD32: Atlantic offshore circalittoral coarse sediment.
- 8.4.19 Benthic grab surveys were undertaken at the East Anglia ONE site [23] as part of the East Anglia Array development, approximately 25km to the south of the proposed LSO section of the EIA Scoping Area. These surveys aimed to characterise benthic subtidal communities within the East Anglia zone [24], within which the study areas are located. The survey found the sediment to be mobile sandy substrate, with a total of 428 taxa recorded across 643 faunal grabs, and a mean of 16 taxa per sample. These data and the predominant substrata show the East Anglia Zone to support relatively low abundances of small fauna drawn from a limited range of taxa

which therefore suggests that parts of this offshore zone are of limited ecological importance.

- 8.4.20 Of these data, annelids made up the greatest abundance and taxonomic richness contribution, and echinoderms the largest biomass. Further grab sampling has been undertaken within the offshore zone which showed polychaetes to be most numerous, accounting for 57% of all individuals identified from grab sampling efforts. They were also the most numerous class in terms of species identified with 43% of all species identified as polychaetes. The most numerous polychaete in the East Anglia Zone overall, when data was combined for multiple surveys as part of the East Anglia Array development, was *Sabellaria spinulosa*.
- 8.4.21 The East Coast and Outer Thames Regional Environmental Characterisation ('REC') report [25] also identifies the presence of *Sabellaria spinulosa* reef habitat along parts of the Norfolk and Suffolk coastline. When present in reef form, the habitat is identified as a priority for protection under the OSPAR Convention of the Protection of the Marine Environment of the Northeast Atlantic [26] and Annex I of the Habitats Directive [27] as a marine habitat to be protected within SACs. *S. spinulosa* and *S. alveolata* reefs are also each listed as UK Priority Habitats [28].
- 8.4.22 There are no reefs recorded within the EIA Scoping Area. MAGIC map shows evidence of subtidal biogenic reefs approximately 11km offshore from Hopton-on-Sea. In addition, EMODnet can be used to view 'habitat suitability of reef-forming species in the North Sea' [29], of which the area offshore of Lowestoft and then Great Yarmouth to the north shows high levels of habitat suitability. Due to the nature of the species, it is proposed that further surveys are undertaken to rule out the presence of reef structures in the study area (as outlined in Appendix 6.2).
- 8.4.23 Benthic ecology surveys were also undertaken as part of the Great Yarmouth Third River Crossing project [30]. These surveys suggest the subtidal environment of the River Yare, approximately 2km north of the EIA Scoping Area, supports a range of benthic and epibiota communities.

Subtidal sediment infauna includes common worms in moderate to high numbers, in addition to estuarine bivalves and amphipod crustaceans. A total of 146 benthic taxa were identified from 24 grab samples. Nematodes and blue mussel (*Mytilus edulis* juveniles) were the most frequently recorded taxa. Annelid worms dominated the grabs and accounted for 45.5% of counted individuals. Epibiota were dominated by anemones and barnacles. Particle size analysis data was combined with biological variables to show that the coarse sand content of the sediment in this area is an important determining factor in the observed biological distributions.

- 8.4.24 The only benthic species of conservation interest recorded in the habitat surveys for the Great Yarmouth Third River Crossing project was the ross worm *S. spinulosa*. It is only significant if reef forming, as previously discussed. Numbers found in these surveys were too low to constitute evidence of a biogenic reef. Due to the nature of the species, it is proposed that further surveys are undertaken to rule out the presence of reef structures in the study area (as outlined in Appendix 6.2).

## Fish Ecology

### Fish Populations

- 8.4.25 Beam trawls were undertaken as part of the Great Yarmouth Third River Crossing project [31], approximately 2km north of the proposed LSO section of the EIA Scoping Area. From these data, the most abundant taxon recorded was brown shrimp (*Crangon crangon*). Other invertebrates were less common but included opossum shrimps (*Neomysis integer* and *Schistomysis kervillei*) and shore crabs (*Carcinus maenas*). Sand goby (*Pomatoschistus minutus*) were the most abundant fish species. Lozano's goby (*Pomatoschistus lozanoi*) and common gobies (*P. microps*) were recorded in very low numbers across the beam trawls, as were the flatfish Dover sole (*Solea solea*), flounder (*Platichthys flesus*) and plaice (*Pleuronectes platessa*). A single three-spined stickleback (*Gasterosteus aculeatus*) was also found.

- 8.4.26 Specific fisheries surveys were undertaken by the East Anglia offshore Wind project in 2013 [32]. Fish and shellfish assemblages were sampled using a commercial demersal otter trawl and four metre commercial beam trawl. A total of 18 species were caught during otter trawl sampling with the highest catch rate per unit effort recorded for dab (*Limanda limanda*), plaice, and whiting (*Merlangius merlangus*). A total of 23 species of fish and shellfish were present in the beam trawl sampling. Plaice and dab were, again, the most abundant species recorded.
- 8.4.27 Further sampling was undertaken to support the development of the East Anglia THREE Offshore Wind Farm project [33]. A total of 42 fish and invertebrate species were recorded as part of 2m scientific beam trawl surveys. Species diversity was widely consistent with the commercial trawls, although the most abundant species were non-commercial, smaller species like solenettes (*Buglossidium luteum*), sand gobies, and lesser weeviers (*Echiichthys vipera*) (due to smaller meshed cod end on the 2m beam trawl). Brown shrimp were again the most abundant invertebrate.

### Species of Conservation Importance

- 8.4.28 Migratory species of conservation importance can be found in Table 8-6. Elasmobranchs have slow growth and low reproductive outputs, resulting in low stock resilience to fishing mortality and slow recovery rates from stock depletion. The thornback ray is noted to be present within or around the EIA Scoping Area. This species is on the International Union for the Conservation of Nature's ('IUCN') 'Red List' [34] as 'near threatened' and is included in the OSPAR list of threatened and/or declining species.
- 8.4.29 The East Anglia ONE North Offshore Windfarm project recorded a number of other fish and shellfish species [35] with designated conservation status to be present within the Norfolk/Suffolk coastal/offshore area. These species may therefore be within or close to the EIA Scoping Area and are presented in Table 8-4.



Table 8-4: Conservation Status of Species identified within the Norfolk/Suffolk Offshore Area, as identified by East Anglia ONE North Offshore Windfarm Project [36]

| Common Name    | Latin Name                   | Conservation Status                      |       |                                                                  |               |                      |       |              |                                                                        |
|----------------|------------------------------|------------------------------------------|-------|------------------------------------------------------------------|---------------|----------------------|-------|--------------|------------------------------------------------------------------------|
|                |                              | UK Biodiversity Action Plan ('BAP') [37] | OSPAR | Natural Environment and Rural Communities ('NERC') Act 2006 [38] | IUCN Red List | Bern Convention [39] | CITES | W&C Act 1981 | The Conservation of Habitats and Species Regulations 2017 (as amended) |
| Demersal       |                              |                                          |       |                                                                  |               |                      |       |              |                                                                        |
| Cod            | <i>Gadus morhua</i>          | ✓                                        | ✓     | ✓                                                                | Vulnerable    |                      |       |              |                                                                        |
| Plaice         | <i>Pleuronectes platessa</i> | ✓                                        |       | ✓                                                                | Least concern |                      |       |              |                                                                        |
| Gobidae sp.    | <i>Pomatoschistus</i> sp.    |                                          |       |                                                                  | Least concern | ✓                    |       |              |                                                                        |
| Lesser sandeel | <i>Ammodytes marinus</i>     | ✓                                        |       | ✓                                                                |               |                      |       |              |                                                                        |
| Common sole    | <i>Solea solea</i>           | ✓                                        |       | ✓                                                                |               |                      |       |              |                                                                        |
| Whiting        | <i>Merlangius merlangus</i>  | ✓                                        |       | ✓                                                                |               |                      |       |              |                                                                        |
| Ling           | <i>Molva molva</i>           | ✓                                        |       | ✓                                                                |               |                      |       |              |                                                                        |
| European hake  | <i>Merluccius merluccius</i> | ✓                                        |       | ✓                                                                |               |                      |       |              |                                                                        |



| Common Name    | Latin Name                 | Conservation Status                      |       |                                                                  |               |                      |       |              |                                                                        |
|----------------|----------------------------|------------------------------------------|-------|------------------------------------------------------------------|---------------|----------------------|-------|--------------|------------------------------------------------------------------------|
|                |                            | UK Biodiversity Action Plan ('BAP') [37] | OSPAR | Natural Environment and Rural Communities ('NERC') Act 2006 [38] | IUCN Red List | Bern Convention [39] | CITES | W&C Act 1981 | The Conservation of Habitats and Species Regulations 2017 (as amended) |
| Pelagic        |                            |                                          |       |                                                                  |               |                      |       |              |                                                                        |
| Herring        | <i>Clupea harengus</i>     | ✓                                        |       | ✓                                                                | Least concern |                      |       |              |                                                                        |
| Horse mackerel | <i>Trachurus trachurus</i> | ✓                                        |       | ✓                                                                |               |                      |       |              |                                                                        |
| Mackerel       | <i>Scomber scombrus</i>    | ✓                                        |       | ✓                                                                | Least concern |                      |       |              |                                                                        |
| Shellfish      |                            |                                          |       |                                                                  |               |                      |       |              |                                                                        |
| Horse mussel   | <i>Modiolus modiolus</i>   |                                          | ✓     | ✓                                                                |               |                      |       |              |                                                                        |
| Blue mussel    | <i>Mytilus edulis</i>      | ✓                                        | ✓     | ✓                                                                |               |                      |       |              | ✓                                                                      |
| Dog whelk      | <i>Nucella lapillus</i>    |                                          | ✓     | ✓                                                                |               |                      |       |              |                                                                        |
| Crawfish       | <i>Palinurus elephas</i>   | ✓                                        |       |                                                                  |               |                      |       |              |                                                                        |
| Fan mussel     | <i>Atrina fragilis</i>     | ✓                                        |       |                                                                  |               |                      |       | ✓            |                                                                        |

| Common Name   | Latin Name               | Conservation Status                      |       |                                                                  |               |                      |       |              |                                                                        |
|---------------|--------------------------|------------------------------------------|-------|------------------------------------------------------------------|---------------|----------------------|-------|--------------|------------------------------------------------------------------------|
|               |                          | UK Biodiversity Action Plan ('BAP') [37] | OSPAR | Natural Environment and Rural Communities ('NERC') Act 2006 [38] | IUCN Red List | Bern Convention [39] | CITES | W&C Act 1981 | The Conservation of Habitats and Species Regulations 2017 (as amended) |
| Ocean quahog  | <i>Arctica islandica</i> |                                          | ✓     | ✓                                                                |               |                      |       |              |                                                                        |
| Native oyster | <i>Ostrea edulis</i>     | ✓                                        | ✓     | ✓                                                                |               |                      |       |              |                                                                        |

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### Spawning and Nursery Habitats

- 8.4.30 A desk-based review of existing literature and data sources identified several fish species that utilise the coastal waters within the EIA Scoping Area and wider study area as spawning and nursery grounds [40]. Further details can be found in Table 8-5.
- 8.4.31 Information relating to the hearing group of these species is also included as underwater noise is a likely significant effect.

Table 8-5: Use of Study Areas Relevant to LSO Options 1, 2 and 3 by Fish Species as Spawning and Nursery Grounds, including Information on Hearing Group and Conservation Status

| Species                                | Hearing Group                                                              | Use of Study Area            |                | Conservation Designation                                  | Spawning Season                              | Ecology                                                                                                                                                                           |
|----------------------------------------|----------------------------------------------------------------------------|------------------------------|----------------|-----------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |                                                                            | Spawning                     | Nursery        |                                                           |                                              |                                                                                                                                                                                   |
| Thornback Ray<br><i>Raja clavata</i>   | Group 1: Fish with no swim bladder or other gas chamber                    | -                            | Low intensity  | IUCN (Near Threatened)                                    | February - September (peak: April to August) | Fully marine species, juveniles may occur in coastal waters but are mostly found more than 10m deep.                                                                              |
| Herring<br><i>Clupea harengus</i>      | Group 3: Fish in which hearing involves a swim bladder or other gas volume | Yes (undetermined intensity) | High intensity | UK BAP, IUCN (Least Concern)                              | August - October                             | Herring spawn on gravel and similar habitats, with low abundance of fine sediments and well-oxygenated water. Species utilises estuarine and coastal habitats as nursery grounds. |
| Cod<br><i>Gadus morhua</i>             | Group 3: Fish in which hearing involves a swim bladder or other gas volume | -                            | Low intensity  | IUCN Status: Global: (Vulnerable) Europe: (Least Concern) | January - April (peak: February/ March)      | Cod utilise estuarine and coastal waters as nursery grounds.                                                                                                                      |
| Whiting<br><i>Merlangius merlangus</i> | Group 3: Fish in which hearing                                             | -                            | Low intensity  | UKBAP, IUCN (Least Concern)                               | February - July                              | Whiting utilises estuarine and coastal waters as nursery grounds.                                                                                                                 |

| Species                                | Hearing Group                                           | Use of Study Area |               | Conservation Designation                                                                | Spawning Season                            | Ecology                                                              |
|----------------------------------------|---------------------------------------------------------|-------------------|---------------|-----------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------|
|                                        |                                                         | Spawning          | Nursery       |                                                                                         |                                            |                                                                      |
|                                        | involves a swim bladder or other gas volume             |                   |               |                                                                                         |                                            |                                                                      |
| Sand eels<br><i>Ammodytidae</i>        | Group 1: Fish with no swim bladder or other gas chamber | Low intensity     | Low intensity | The lesser sand eel is a Priority Species under the UK Post 2010 Biodiversity Framework | January - February                         | Majority of sand eels utilise the coastal waters as nursery grounds. |
| Mackerel<br><i>Scomber scombrus</i>    | Group 1: Fish with no swim bladder or other gas chamber | -                 | Low intensity | UK BAP, IUCN (Least Concern)                                                            | May - August (peak: May - July)            | Mackerel is a fully marine species that is common in coastal waters. |
| Plaice<br><i>Pleuronectes platessa</i> | Group 1: Fish with no swim bladder or other gas chamber | -                 | Low intensity | IUCN (Least Concern)                                                                    | January - March (peak: January - February) | Plaice utilises estuarine and coastal waters as nursery grounds.     |
| Sole<br><i>Solea solea</i>             | Group 1: Fish with no swim bladder or other gas chamber | Low intensity     | Low intensity | UK BAP                                                                                  | March - June (peak: in April)              | Plaice utilises estuarine and coastal waters as nursery grounds.     |

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- 8.4.32 Most of the species with spawning grounds within, overlapping, or close to the study areas as detailed in Table 8-5 are pelagic spawners, releasing their eggs into the water column. Exceptions to this are herring and sand eel which are demersal spawners, as well as the thornback ray which lays eggs on benthic substrates.
- 8.4.33 The Outer Thames Estuary SPA is notified for red-throated diver, which feed on cod, gobies, and sand eel. These species utilise the shallow intertidal and subtidal sandbanks as nursery and foraging grounds.

### **Migratory Fish**

- 8.4.34 It is possible that several diadromous species may be present during the marine migration phase of their life cycle within or near to the study areas. The presence of these species is well-documented in the wider study area [41], [42]. A summary of these species with their conservation status is presented in Table 8-6.

Table 8-6: Conservation Status of Diadromous Migratory Species Relevant to the Study Areas

| Common name   | Latin name                  | Conservation Status |            |               |                       |                 |       |                   |                                                                        |
|---------------|-----------------------------|---------------------|------------|---------------|-----------------------|-----------------|-------|-------------------|------------------------------------------------------------------------|
|               |                             | UK BAP              | OSPAR [43] | NERC Act 2006 | IUCN Red List         | Bern Convention | CITES | W&C Act 1981 [44] | The Conservation of Habitats and Species Regulations 2017 (as amended) |
| European eel  | <i>Anguilla anguilla</i>    | ✓                   | ✓          | ✓             | Critically endangered |                 | ✓     |                   |                                                                        |
| Allis shad    | <i>Alosa alosa</i>          | ✓                   | ✓          | ✓             | Least concern         | ✓               |       | ✓                 | ✓                                                                      |
| Twaite shad   | <i>Alosa fallax</i>         | ✓                   | ✓          | ✓             | Least concern         | ✓               |       | ✓                 | ✓                                                                      |
| Sea lamprey   | <i>Petromyzon marinus</i>   | ✓                   | ✓          | ✓             | Least concern         | ✓               |       |                   | ✓                                                                      |
| River lamprey | <i>Lampetra fluviatilis</i> | ✓                   | ✓          | ✓             | Least concern         | ✓               |       |                   | ✓                                                                      |
| Sea trout     | <i>Salmo trutta</i>         | ✓                   | ✓          | ✓             | Least concern         |                 |       |                   |                                                                        |
| Smelt         | <i>Osmerus eperlanus</i>    | ✓                   | ✓          | ✓             | Least concern         |                 |       |                   |                                                                        |

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### Commercial Fish and Shellfish Fisheries

- 8.4.35 The inshore coastal areas along Norfolk and Suffolk support several commercial fisheries. As of 1 June 2026, 22 fishing vessels under 10m in length and 3 fishing vessels over 10m in length use Lowestoft as their home port [45]. The Eastern IFCA describe the district (which comprises Eastern Haile Sand Fort in the north to Felixstowe in the south, encompassing the counties of Lincolnshire, Norfolk and Suffolk and extending a further six nautical miles from their coastlines) as dominated with small inshore trawlers fishing for demersal species such as cod, sole, plaice, whiting and ray species.
- 8.4.36 In addition, crustacean shellfisheries are of high importance. Predominantly in the summer months, European lobster (*Homarus gammarus*) and edible crab (*Cancer pagurus*) are targeted. There are no designated shellfisheries areas within the study area. The nearest is approximately 45km away.
- 8.4.37 The MMO's UK Sea Fisheries 2024 report shows landings in International Council for the Exploration of the Sea ('ICES') Area IVc [46], which the study areas fall within, to be 2.18 kilotons ('kt') of demersal species, 1.73kt of pelagic species, and 10.94kt of shellfish. ICES areas are further divided to create ICES rectangles, of which the EIA Scoping Area falls within 33F1. Due to its close proximity, 33F2 has also been considered. The annual landings by UK fleet in 2024 in 33F1 was 46.95 tonnes live weight (£300,000 value), and 72.37 tonnes live weight (£240,000) in 33F2. The MMO's UK landings data set [47] shows the species with the highest live weight from 33F1 was Herring in 2024 (256.35 tonnes). Whelks were recorded as the highest live weight shellfish species with a total live weight of 171.82 tonnes. The main catch method is pots and traps. Similarly, in 2023, herring was recorded as the highest live weight fish species (114.93 tonnes), and whelk as the highest recorded live weight shellfish species (133.26 tonnes). Figure 8-4 shows the total live weight of all catch (fish and shellfish) between 2020 and 2024 for the 33F1 ICES rectangle.



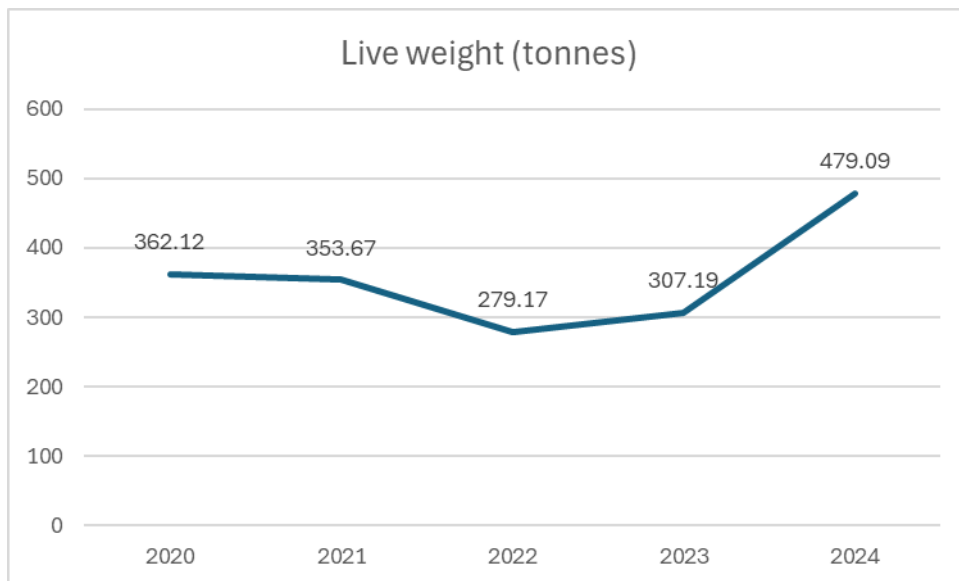


Figure 8-4 : Live weight (tonnes) of fish and shellfish caught between 2020-2024 in the 33F1 ICES rectangle

- 8.4.38 Within the 2024 MMO data, other commercial species were caught in lesser quantities. For example, 11.07 tonnes of bass, 9.85 tonnes of sole, and 3.93 tonnes of flounder or flukes were the next highest catch rates.
- 8.4.39 Beam trawls conducted as part of the Great Yarmouth Third River Crossing project [48] identified a large number of brown shrimp, which are considered commercially important. Several flatfish species were also found in low numbers (dover sole, flounder, plaice).
- 8.4.40 Fisheries surveys undertaken by the East Anglia THREE Offshore Wind Farm project in 2013 [49], recorded the highest catch rate per unit effort for dab (*Limanda limanda*), plaice, and whiting (*Merlangius merlangus*) using a commercial otter and commercial beam trawl.
- 8.4.41 During sampling for the East Anglia THREE Offshore Wind Farm [50] a 2m scientific beam trawl recorded Brown shrimp as the most abundant invertebrate.

### Marine Mammals

- 8.4.42 Seven species of marine mammal are known to inhabit the wider Norfolk and Suffolk coast. Due to the highly mobile nature of marine mammals, it is

assumed that the following species have the potential to be present within the EIA Scoping Area and defined marine biodiversity study area (refer to Table 8-1); harbour porpoise (*Phocoena phocoena*), white-beaked dolphin (*Lagenorhynchus albirostris*), bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), minke whale (*Balaenoptera acutorostrata*), harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*). All seven species are listed under The Conservation of Habitats and Species Regulations 2017 (as amended). The harbour and grey seal are protected under the Conservation of Seals Act 1970 [51] and all species except the grey seal are listed as UK BAP species.

- 8.4.43 As outlined above, the study area is situated within the Southern North Sea SAC, which is designated for the protection of harbour porpoise. It is estimated to support 17.5% of the UK North Sea Management Unit population (approximately 340,000 individuals [52]). The northern two-thirds of the Southern North Sea SAC is important for porpoises during the summer season, during mating and calving, when coastal areas and sandbank habitats are relied on for feeding. The southern part of the Southern North Sea SAC is known to support higher densities during the winter. Harbour porpoise use echolocation to feed and catch prey [53]. Their main food source is large numbers of small demersal and pelagic fish, including herring, sand eels, sprat, whiting, mackerel and cod [54], which also use the shallow subtidal and intertidal sandbanks present near the study area for spawning and nursery grounds.
- 8.4.44 The nearest harbour seal breeding site, and grey and harbour seal haul-out site is Scroby Sands, approximately 3.5km north from the LSO section of the EIA Scoping Area [55]. Scroby Sands is a 6.4km dynamic sandbank located approximately 2.5km offshore at Great Yarmouth and is known to support a mixed population of hundreds of harbour and grey seals.
- 8.4.45 A survey of the East Anglian coast from Donna Nook to Scroby Sands was completed in 2020, with three more surveys completed in 2021. Between 2019 and 2021, the mean total count of harbour seals in this area was

3,080 seals. This was 38% lower than the previous years (between 2014 and 2018 the mean total count was 4,296 seals) [56].

- 8.4.46 The study areas were included in the Small Cetaceans in European Atlantic Waters and the North Sea ('SCANS') IV international survey to study the distribution and abundance of cetaceans in European Atlantic waters (summer 2022) [57]. The study areas fall within the NS-B block (North Sea, block B: blocks used to split the survey area), which has a total surface area of 25,785km<sup>2</sup>. Of this, 1,719.9km<sup>2</sup> was surveyed. The survey estimated a total of 7,982 harbour porpoise in this block from aerial surveys. No other cetaceans were sighted, nor abundances could be estimated for this area.

### Marine Ornithology

- 8.4.47 Site-specific surveys were undertaken for the East Anglia ONE North Offshore Wind Farm project [58].
- 8.4.48 The species recorded, their conservation status, and their breeding period are shown in Table 8-7.

Table 8-7: Marine Bird Species Recorded by East Anglia ONE North Offshore Wind Farm Surveys, within the vicinity of the Study Areas

| Species            | Common Name               | Breeding Season   | Conservation Status                                                            |
|--------------------|---------------------------|-------------------|--------------------------------------------------------------------------------|
| Red-throated diver | <i>Gavia stellata</i>     | March - August    | Birds of Conservation Concern ('BoCC'), Green listed, Birds Directive Annex 1. |
| Fulmar             | <i>Fulmarus glacialis</i> | January - August  | BoCC Amber listed, Birds Directive Migratory Species.                          |
| Gannet             | <i>Morus bassanus</i>     | March - September | BoCC Amber listed, Birds Directive Migratory Species.                          |
| Great skua         | <i>Stercorarius skua</i>  | May - August      | BoCC Amber listed, Birds Directive Migratory Species.                          |
| Razorbill          | <i>Alca torda</i>         | April - July      | BoCC Amber listed, Birds Directive Migratory Species.                          |

| Species                     | Common Name                          | Breeding Season | Conservation Status                                   |
|-----------------------------|--------------------------------------|-----------------|-------------------------------------------------------|
| Guillemot                   | <i>Uria aalge</i>                    | March - July    | BoCC Amber listed, Birds Directive Migratory Species. |
| Sandwich tern               | <i>Thalasseus sandvicensis</i>       | April - August  | BoCC Amber listed, Birds Directive Annex 1.           |
| Tern sp. (Arctic or common) | <i>Sterna</i> sp. (Arctic or common) | May - August    | BoCC Amber listed, Birds Directive Annex 1.           |
| Kittiwake                   | <i>Rissa tridactyla</i>              | March - August  | BoCC Red listed, Birds Directive Migratory Species.   |
| Black-headed gull           | <i>Chroicocephalus ridibundus</i>    | -               | BoCC Amber listed, Birds Directive Migratory Species. |
| Little gull                 | <i>Hydrocoloeus minutus</i>          | April - July    | BoCC Amber listed, Birds Directive Migratory Species. |
| Common gull                 | <i>Larus canus</i>                   | -               | BoCC Amber listed, Birds Directive Migratory Species. |
| Lesser black-backed gull    | <i>Larus fuscus</i>                  | April - August  | BoCC Amber listed, Birds Directive Migratory Species. |
| Herring gull                | <i>Larus argentatus</i>              | March - August  | BoCC Red listed, Birds Directive Migratory Species.   |
| Great black-backed gull     | <i>Larus marinus</i>                 | March - August  | BoCC Amber listed, Birds Directive Migratory Species. |

## Water Quality

8.4.49 Physical, chemical and phytoplankton water quality data will be collected in 2026-2027 around the dispersion array and within the projected dispersion plume (monthly for one year) for the Proposed Development's LSO component (proposed new LSO (Option 1) and use of the existing outfall at Ness Point (Options 2 and 3).

8.4.50 The EIA Scoping Area falls within the Norfolk East Water Body (GB650503520003) [59], which is a coastal water of 'moderate' ecological

status. This waterbody is heavily modified and covers a total surface area of 212.051km<sup>2</sup>. Reasons for not achieving 'good' status and reasons for deterioration as per the Catchment Data Explorer are as follows:

- Polybrominated diphenyl ethers ('PBDE').
- Dissolved inorganic nitrogen (from sewage discharge and poor nutrient management).
- Mercury and its compounds.

8.4.51 Data was obtained through the EA Water Quality Explorer [60] for the sampling point 'NORTH SEA AT 52-33.6N 01-46.3E NO.31A'. This data point is approximately 1.5km from the LSO section of the EIA Scoping Area and was most recently sampled in May 2026. The following determinands were recorded:

- Nitrogen, dissolved inorganic: <0.11 milligrams per litre ('mg l<sup>-1</sup>') (').
- Salinity in situ: 33.75 parts per thousand ('ppt').
- Nitrate: <0.096 mg l<sup>-1</sup>.
- Orthophosphate, filtered as phosphorus ('P'): <0.01 mg l<sup>-1</sup>.
- Silicate, filtered as silicon dioxide ('SiO<sub>2</sub>'): <0.2 mg l<sup>-1</sup>.
- Oxygen, dissolved, % saturation: 101.5%.
- Oxygen, dissolved as oxygen ('O<sub>2</sub>'): 8.86 mg l<sup>-1</sup>.
- Nitrogen ('N'), total oxidised, filtered as N: <0.1 mg l<sup>-1</sup>.
- Ammoniacal nitrogen, filtered as N: <0.01 mg l<sup>-1</sup>.

8.4.52 The sampling point 'NORTH SEA AT 52-27.4N 01-47.2E NO.34' can also be used as a reference for water quality offshore of Lowestoft. The most recent samples from the point were collected in May 2026. The following determinands were recorded:

- Nitrogen, dissolved inorganic: 0.119 mg l<sup>-1</sup>.
- Salinity in situ: 33.29 ppt.
- Nitrate: 0.109 mg l<sup>-1</sup>.
- Orthophosphate, filtered as P: 0.004 mg l<sup>-1</sup>.
- Silicate, filtered as SiO<sub>2</sub>: <0.02 mg l<sup>-1</sup>.
- Oxygen, dissolved, % saturation: 105.1%.
- Oxygen, dissolved as O<sub>2</sub>: 9.24 mg l<sup>-1</sup>.

- Nitrogen, total oxidised, filtered as N: 0.11 mg l<sup>-1</sup>.
- Ammoniacal nitrogen, filtered as N: 0.0087 mg l<sup>-1</sup>.

8.4.53 Water quality at designated bathing water sites in England are assessed by the EA. From May to September, samples are taken to measure water quality, and at a number of sites daily pollution risk forecasts are issued [61]. The following bathing waters are within 5km of the offshore area of the EIA Scoping Area:

- Gorleston Beach (approximately 2.2km north of the LSO section of the EIA Scoping Area) – assessed as ‘excellent’ (2025).
- Lowestoft (North of Claremont Pier) (approximately 6.7km south of the LSO section of the EIA Scoping Area) – assessed as ‘good’ (2025).
- Lowestoft (South of Claremont Pier) (approximately 7.2km south of the LSO section of the EIA Scoping Area) – assessed as ‘good’ (2025).

8.4.54 Historic water quality and plankton monitoring sites within the study areas are shown in Figure 8-3.

### Invasive Non-Native Species (‘INNS’)

8.4.55 In the Great Yarmouth Third River Crossing project surveys, approximately 2km to the north of the LSO section of the EIA Scoping Area, several INNS were recorded. The most significant was the manila clam (*Ruditapes philippinarum*). The Australasian barnacle (*Austrominius modestus*) was present at most wall sampling stations within the River Yare itself, and at several grab samples in high abundance. American Slipper limpets (*Crepidula fornicata*) were found in several grab samples. One specimen of the ostracod crustacean (*Eusarsiella zostericola*) was recorded. A polychaete *Streblospio* sp. was recorded and is likely to have been the non-native *S. benedicti*, which is recently recognised to have spread widely in Britain and Europe. The cryptogenic ragworms *Alitta succinea* and *A. virens* were also recorded in the river [62].

8.4.56 The Norfolk Non-native Species Initiative [63] also reported *Eriocheir sinensis*, the Chinese mitten crab, as present in the waterways near the LSO section of the EIA Scoping Area. This species undergoes an annual

migration through brackish and saltwater, and so could pass through the study area.

- 8.4.57 Devil's tongue weed (*Grateloupia turuturu*) has been recorded as present on the north coast of Norfolk and therefore could be present in the study area [64].

## 8.5 Likely Significant Effects

- 8.5.1 The Proposed Development has the potential for a range of impacts on important biodiversity features. As set out in the CIEEM Guidelines, impacts can be either direct or indirect:

- A direct impact is considered to be a direct/ immediate consequence of the Proposed Development, or particular activity, without any intervening steps. In this instance, this is a physical loss or gain of a habitat, or direct mortality/damage of an individual, or species population.
- An indirect impact is considered to be an impact on one individual, population, or habitat arising from an impact on an intermediary or as a result of an impact pathway.

- 8.5.2 Potential impact pathways from the Proposed Development which have been identified at this scoping stage include:

- Changes to water quality and sediments dynamics.
- Direct physical disturbance and habitat loss.
- Underwater noise and indirect ecological interactions with the wider ecosystem.

- 8.5.3 Whether an impact pathway has a potential to result in a likely significant effect will depend upon a range of factors, such as:

- The nature and scale of the Proposed Development.
- The proximity to the biodiversity feature.
- The sensitivity of the biodiversity feature.

- 8.5.4 Impacts may be either permanent (e.g. loss of a habitat during construction of permanent infrastructure), or temporary. Temporary impacts may be either:

- Short-term e.g. associated with temporary construction activities.
- Medium-term e.g. loss of a habitat which is subsequently reinstated.
- Long-term e.g. where operational activities or persistent environmental changes alter habitat conditions or species assemblages.

8.5.5 Taking into account the impact pathways described above, the likely significant effects that may occur during the construction, operational and decommissioning phases of the Proposed Development, in the absence of mitigation, are set out in the sections below.

### Construction Phase

8.5.6 In the context of the impact pathways described in paragraph 8.5.2, the following likely significant effects on marine biodiversity receptors have been identified during the construction phase for Options 1, 2 and 3 of the Proposed Development's LSO component.

### Physical Habitat Loss and Degradation

- Direct loss and/or degradation of supralittoral, intertidal and subtidal habitats (including coastal) where the Proposed Development's LSO component's infrastructure (e.g. pipe, dispersion array) is installed.
- Temporary disturbance to surrounding habitats in the supralittoral, intertidal and subtidal zones during outfall installation.
- Abrasion of sediment during construction activities and vessel movement.

### Water Quality

- Sediment mobilisation from seabed disturbance and vessel movement during construction activities.
- Potential release of contaminants from disturbed sediments.
- Elevated turbidity, with the potential to cause smothering and disturb fish and invertebrate physiology and behaviour.

### Disturbance to Marine Species

- Direct mortality of sessile species (invertebrates).
- Displacement of mobile species (fish, birds, mammals).
- Disruption during sensitive periods (e.g. spawning, breeding) of marine biodiversity receptors.



## INNS

- Introduction/spread of INNS via construction equipment, plant vehicles and vessels and the importation of sediment (if required) for scour protection.

## Underwater Noise

- Underwater noise disturbance from vessel movement and construction activities on sensitive marine receptors.

## Pollution Events

- Risk of a pollution event (such as an oil spill or chemical spill) occurring from the use of plant and machinery adjacent to and within the marine environment.
- Potential impact to wide range of marine ecological receptors dependant on type/scale.

## Operational Phase

- 8.5.7 In the context of the impact pathways described in paragraph 8.5.2, the following likely significant effects on marine biodiversity receptors have been identified during the operational phase for Options 1, 2 and 3 of the Proposed Development's LSO component.

## Water Quality

- Input of discharge effluent from the Proposed Development's AWRP component, leading to a change in the water quality of the water column at the dispersion array and surrounding water.
- Changes to nutrient concentrations (phosphorus, nitrogen) affecting plankton growth and the higher food chain.
- Potential change to food availability for higher order species due to change in plankton growth.
- Potential input of trace contaminants or endocrine disrupting compounds from effluent.

## Decommissioning Phase

- 8.5.8 Decommissioning phase effects of the Proposed Development are anticipated to be of a similar nature to effects predicted in the construction phase, since similar activities and levels of disturbance may be required. The following likely significant effects have been identified during

decommissioning (applicable to Options 1, 2 and 3 of the Proposed Development's LSO component):

- Physical habitat loss and degradation during removal of infrastructure.
- Disturbance to marine species.
- Sediment mobilisation (if buried infrastructure is removed).
- Underwater noise disturbance (if buried infrastructure is removed).
- Cessation of effluent discharge and return to baseline water quality conditions.

8.5.9 At the current early stage of design of the Proposed Development, it is assumed that a new LSO (Option 1) and Option 2 and 3 (utilising existing third-party infrastructure) would be left in situ (but could potentially be removed, as outlined in Section 2.6 of chapter 2 the Proposed Development). Should there be any need for buried infrastructure to be removed, then sediment mobilisation and underwater noise disturbance may need to be scoped into the ES. This will be reviewed as the design progresses and assessed as appropriate in the ES.

## 8.6 Impacts Scoped Out of the Assessment

8.6.1 Potential impacts are proposed to be scoped out of the assessment where there is no realistic impact pathway linking activities from the Proposed Development to marine biodiversity receptors, or where effects would clearly be negligible.

8.6.2 The following potential impacts are proposed to be scoped out of the assessment in the ES:

- Impacts on marine biodiversity receptors considered to not comprise 'important ecological features'. As per the CIEEM Guidelines, a geographical framework has been applied to identify if a marine ecological receptor is sufficiently important, and therefore, has the potential to experience a significant ecological effect from the Proposed Development. Marine ecological receptors not considered 'important ecological features' at a local level or above (refer to paragraph 8.8.9) are proposed to be scoped out of the assessment in the ES. This scoping-out is based on the absence of a credible impact pathway, geographic distance, low receptor sensitivity, and the scale of effect not

being capable of giving rise to a significant ecological effect, either alone or in-combination.

- Potential impacts on marine biodiversity receptors beyond the specified study areas. Study areas have been developed to identify both direct and indirect impact pathways and suitable buffer distances have been applied. As such, beyond the study areas, any potential impacts are unlikely to be significant. Since the study areas have been developed based on the LSO component of the scheme only, all other components of the scheme have been scoped out.
- Potential impacts on statutory and non-statutory designated sites beyond the specified study areas. Wider study areas have been applied in consideration of the hydrological connectivity of the marine environment and the highly mobile nature of species protected by designated sites. As such, beyond the study areas, any potential impacts are unlikely to be significant.

8.6.3 Where uncertainty exists regarding potential impact pathways or receptor sensitivity, impacts have been proposed to be scoped into the assessment in the ES on a precautionary basis. Further additional ecological receptors, or impact pathways, may be scoped out of assessment in the ES for some or all of the Proposed Development's components as survey data is collected and the understanding of impacts from the Proposed Development is developed, such that the assessment will only include potential impacts that could result in likely significant effects on marine biodiversity.

## 8.7 Proposed Approach to Mitigation

8.7.1 Following the CIEEM Guidelines, and as described in chapter 6 terrestrial biodiversity and chapter 7 freshwater biodiversity of this Scoping Report, a hierarchical approach to mitigation will be applied, whereby through design, negative ecological impacts and effects are avoided, where possible. Where avoidance is not possible, mitigation measures that minimise negative impacts should be incorporated into the design. Compensation may also be required, however, as stated in the CIEEM Guidelines, this is particularly difficult to achieve in the marine environment.

8.7.2 At this scoping stage, mitigation measures are described at a high level and are indicative only. No potential effects are scoped out based on proposed mitigation.

- 8.7.3 The mitigation measures proposed below are preliminary and will be developed as the design evolves and further baseline information is available. Full details of all mitigation measures, along with the mechanism for delivery, will be provided within the ES.
- 8.7.4 Primary, secondary and tertiary mitigation relevant to marine biodiversity effects would include, but are not limited to, the following measures.

### Primary (Inherent) Mitigation

- Site selection to avoid the potential for any likely significant effects (where possible) to protected and high value marine biodiversity receptors (designated sites, notable habitats and species).
- The use of non-invasive construction techniques, such as horizontal directional drilling, where feasible, to avoid habitat loss and disturbance of marine biodiversity receptors.
- The effluent from the LSO component of the Proposed Development to be treated to reduce potential water quality impacts.
- The LSO's design incorporating technology such as a diffusion array to minimise impact of discharged effluent through rapid mixing and dispersion.

### Secondary (Foreseeable) Mitigation

- Where possible, the construction programme would avoid undertaking activities that could result in disturbance during sensitive time periods for marine biodiversity receptors. For example, avoiding disturbance to breeding and wintering birds and sensitive fish spawning periods.
- Habitat creation and enhancement schemes (supralittoral and intertidal habitats to mean low water mark only).

### Tertiary (Inexorable) Mitigation

- Adherence to pollution and spill prevention guidelines and construction best practices, such as spill kits and emergency spill response protocols.
- Implementation of the measures outlined in a Construction Environmental Management Plan ('CEMP') in accordance with the Outline Construction Environmental Management Plan ('OCEMP') and measures set out in a Decommissioning Environmental Management Plan ('DEMP') in accordance with the Outline Decommissioning Environmental Management Plan ('ODEMP'), to be submitted with the DCO application.
- Compliance with protected species and habitats legislation.

- Following ecological best practice guidance. For example, JNCC guidance on noise management in harbour porpoise SACs [65] to keep underwater noise areas below the threshold of significant disturbance.
- Implementation of INNS biosecurity protocol.

## 8.8 Proposed Approach to the ES

### Best Practice Guidance

- 8.8.1 The CIEEM Guidelines apply to terrestrial, freshwater, coastal and marine environments. To ensure consistency across the biodiversity chapters of the ES, the assessment approach for marine biodiversity has been aligned with that set out in chapter 6 terrestrial biodiversity and chapter 7 freshwater biodiversity. This alignment reflects the integrated nature of ecological systems and the CIEEM Guidelines. This includes a consistent approach to defining ecological features, characterising impacts, determining magnitude and significance and applying the mitigation hierarchy in accordance with the CIEEM Guidelines.
- 8.8.2 As per chapters 6 and 7, the use of the CIEEM Guidelines diverges from the more general EIA approach set out in chapter 3 EIA methodology, although it is acknowledged in paragraph 3.3.28 of chapter 3 that some disciplines may use a different methodology. The CIEEM Guidelines are considered the industry standard for biodiversity and as such has been adopted for the assessment of effects on terrestrial biodiversity receptors.

### Assessment Methodology

- 8.8.3 This section sets out the proposed methodology for the assessment of likely significant effects on marine biodiversity in the ES. This is based on professional judgement and previous experience, together with guidance outlined above. The assessment will be undertaken in accordance with the CIEEM Guidelines.
- 8.8.4 Baseline conditions will be established through an ongoing desk-based study and field surveys undertaken between 2026 and 2027, as set out in Section 8.4 above.

- 8.8.5 The ES will present an assessment of likely significant effects on important marine ecological receptors, and as such, does not require consideration of effects on every species or habitat that may be present. To determine whether there are likely to be significant effects, it is first necessary to identify whether an ecological receptor is 'important', and therefore whether an effect upon it could be significant, and thus, material in decision-making.
- 8.8.6 The marine biodiversity chapter of the ES will assess effects on important ecological receptors with regard to the positive (beneficial) or negative (adverse) nature, extent, magnitude, duration, timing, frequency, and reversibility of the impacts. For each ecological receptor identified as being important, relevant impacts will be characterised; effects defined (in light of any primary or tertiary ecological mitigation) and their significance assessed; secondary mitigation identified, where required, and residual effects will also be reported.
- 8.8.7 The terms 'impact' and 'effect' are often used synonymously, and this can lead to confusion. For the purposes of the marine biodiversity chapter of the ES, they will be defined as follows, in accordance with CIEEM Guidelines:
- Impacts: Actions resulting in changes to an ecological receptor. For example, the construction activities removing substrate from the seabed.
  - Effects: Outcome to an ecological receptor from an impact. For example, the effects on benthic species from the loss of substrate.

### Sensitivity of Receptors

- 8.8.8 A baseline assessment to characterise the proposed study areas will be undertaken to identify ecological receptors. It will incorporate a comprehensive desk-based study using all available data sources, and targeted field surveys to further support the identification of ecological features where data 'gaps' are identified. Field surveys will follow standardised, best practice methodologies to ensure robustness.
- 8.8.9 The importance of each ecological receptor within the study areas will be determined having regard to a number of contributory factors relating to conservation value. The CIEEM Guidelines recognise that determining

importance is a complex process, which is a matter of professional judgement guided by a number of factors. These include designation and legislative protection as well as biodiversity value, potential value and secondary/supporting value (e.g. rarity, scarcity, function within ecosystem, population trends). Consideration of each ecological receptor having regard to these factors allows their importance to be determined, with reference to the geographic context set out in Table 8-8 below:

Table 8-8: Levels of Ecological Importance and Description/Rationale

| Ecological Importance                   | Description/ Rationale                                                                                                                                                                                    |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| International (European or Worldwide)   | The highest level of importance assigned to features which may be designated at an international level (such as SACs or SPAs), or internationally important habitats, species, or assemblages of species. |
| National (England)                      | Assigned to features which may be designated at a national level (such as SSSIs), or nationally important habitats, species, or assemblages of species.                                                   |
| Regional (East of England)              | Features which are considered to be important at a regional level, for example, the North Sea.                                                                                                            |
| County (Suffolk or Norfolk)             | Features which may be designated at a county level (such as a CWS), or habitats, species, or assemblages of species considered to be of importance at a county level.                                     |
| Local (within the local authority area) | Features which do not meet the threshold for county importance but which are considered to be important at a local level, such as a population of scarce species.                                         |
| Less than Local                         | Habitats, species, or assemblages of species which are common or widespread in the area.                                                                                                                  |

8.8.10 For the purposes of the assessment, any ecological feature of local importance or above will be considered an ‘important ecological feature’ and taken forward for assessment. Features of less than local importance will not be considered ‘important ecological features’ and will be scoped out of any further assessment. Where protected species (of ‘less than local’ importance) are nonetheless present, measures to enable compliance with relevant wildlife legislation and policy will also be considered in the marine biodiversity chapter of the ES.



## Impact Magnitude

- 8.8.11 The magnitude of an impact reflects the degree of change to an ecological receptor caused by the Proposed Development, independent of its importance or sensitivity. Magnitude is assessed on a scale ranging from very low to high, as set out in Table 8-9 below.

Table 8-9: Impact Magnitude Criteria for Marine Biodiversity Receptors

| Magnitude | Definition                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High      | Total loss or major/substantial alteration to key elements/features of the baseline conditions such that the post development character/composition/attributes will be fundamentally changed. Major loss or significant degradation of a feature affecting a substantial part of a receptor's range or population. Recovery may be possible but only in the long-term (>5 years).     |
| Medium    | Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed. Partial loss or moderate degradation affecting a notable proportion of a receptor's range or population. Recovery may be possible within a medium timeframe (2-5 years).                   |
| Low       | A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes will be similar to the baseline condition. Minor loss or slight degradation affecting a small part of a receptor's range or population. Recovery is likely within a short timeframe (<2 years). |
| Very Low  | Very little change from baseline conditions. Change is barely distinguishable, approximating to a 'no change' situation. Negligible loss or change, barely discernible from background conditions. Recovery is immediate or the impact is reversible.                                                                                                                                 |

- 8.8.12 Magnitude will be determined through a quantified approach as far as possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.



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## Effect Significance

- 8.8.13 The nature and extent of the impacts of the Proposed Development will be informed by other assessments reported within and undertaken to support the ES. The predicted impacts may be direct or indirect in nature and may occur in the construction, operational, or decommissioning phases of the Proposed Development. The determination and description of the significance of the predicted ecological effects will be undertaken in accordance with the CIEEM Guidelines along with professional judgement. When considering the likely significant effects, the following characteristics will be considered:
- The positive (beneficial) or negative (adverse) nature.
  - Probability.
  - Extent.
  - Magnitude.
  - Duration.
  - Frequency and timing.
  - Reversibility of the impacts assessed.
- 8.8.14 The assessment may also be informed by conservation objectives for the affected feature, where available (for example conservation objectives for international sites such as marine SACs, or in habitat and species action plans). The ‘conservation status’ or the degree to which a feature is exhibiting ‘integrity’ in terms of structure, function and condition will also be considered.
- 8.8.15 These factors provide a means of characterising the impacts of the Proposed Development and thereby support an assessment of the significance of the effects on the important ecological features determined as relevant in this assessment. The CIEEM Guidelines encourage the expression of significance of ecological effects with reference to the geographic frame of reference, as described above (refer to paragraph 8.8.9 for geographic scale definitions). The CIEEM Guidelines state that an impacts and their effects are evaluated on their significance and should be categorised as either significant or not significant.
-

- 8.8.16 An effect should be determined as being significant in ecological terms when it *‘either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general’*. Significance is a concept related to the weight that should be afforded to effects when decisions are made, and to the consequences, in terms of legislation, policy and/or development control. Therefore, a significant negative (adverse) effect on a feature of importance at one level would be likely to trigger related planning policies and, if permissible at all, generate the need for development control mechanisms, such as planning conditions or legal obligations, as described in those policies.
- 8.8.17 An effect on an important ecological feature may be significant at the same geographic scale at which the feature is determined to be important, or at a lesser geographical scale, depending on the characterisation of the impact.

### Mitigation and Residual Effects

- 8.8.18 The CIEEM Guidelines state that *‘a sequential process should be adopted to avoid, mitigate and compensate negative ecological impacts and effects’*. This is often referred to as the ‘Mitigation Hierarchy’ which is also supported by the NPSWRI [66] and the National Planning Policy Framework (2026) [67] (‘NPPF’).
- 8.8.19 Early consideration of mitigation measures throughout the design evolution of the Proposed Development will allow negative impacts in the marine environment to be avoided where possible and inherent mitigation to form part of the design, where possible.
- 8.8.20 As set out in Section 8.7 above, the marine biodiversity chapter of the ES will take into account primary and tertiary ecological mitigation. Where potential effects arise, secondary mitigation will be described (where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed). Residual significant effects are identified following the application of mitigation measures (primary, secondary, and tertiary). These will be clearly reported in the ES.

- 8.8.21 Where required and deliverable, compensation measures would be considered to offset any residual significant effects.

### In-combination Effects

- 8.8.22 In-combination effects may arise from individually insignificant, but collectively significant, activities taking place over a period of time or concentrated in a location. At this scoping stage, no specific in-combination effects on marine biodiversity have been identified. However, potential in-combination effects will be further considered and assessed within the ES where relevant information on other plans or projects becomes available.
- 8.8.23 As set out in chapter 3 EIA methodology of this Scoping Report, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within the cumulative effects assessment chapter of the ES.
- 8.8.24 A separate in-combination assessment in relation to international sites will also be set out within a separate Habitats Regulations Assessment ('HRA') for the Proposed Development.

### Limitations and Assumptions

- 8.8.25 The following limitations and assumptions have been identified in relation to the assessment of potentially significant effects on marine biodiversity receptors:
- Where feasible, best practice survey methodologies will be adopted to reduce the limitations of the subsequent ecological evaluation and assessment of likely significant effects on marine biodiversity from the Proposed Development.
  - Baseline ecological desk and field survey commenced in April 2026. The baseline data provided comprises the best available data at the time of writing (June 2026). However, the field and desk studies to be undertaken may highlight other ecological features with the potential to be significantly affected, which have not been identified or considered significant at this scoping stage.
  - Specific limitations relevant to each type of field survey will be reported in the baseline assessment once surveys have been completed.

- Spatial scope and interface with the freshwater biodiversity (chapter 7) assessment. The marine biodiversity ES chapter will assess littoral and sublittoral habitats up to MHWS, including up to the saline limit of outer estuarine waters.
  - The freshwater biodiversity ES chapter will assess the upper estuarine waters of the River Waveney estuary above the saline limit, where freshwater and brackish conditions and biological communities predominate, and saline influence becomes negligible.
- 8.8.26 The saline limit represents the downstream boundary of the freshwater biodiversity assessment and the upstream boundary of the marine biodiversity assessment. It will be defined through:
- WFD transitional/coastal waterbody boundaries for the River Waveney catchment.
  - The upstream extent of marine-dominated biological assemblages (stenohaline marine species).
- 8.8.27 This delineation ensures comprehensive coverage of all aquatic receptors, avoiding duplication with the freshwater and marine biodiversity assessments. Where the saline limit position varies seasonally or with tidal/flow conditions, the assessment envelope will capture the full range of potential saline intrusion to ensure a ‘*cautious ‘worst case’’* in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s Nationally Significant Infrastructure Projects (‘NSIPs’): Pre-Application Advice on Environmental Impact Assessment (July 2026) [2].

### Biodiversity Net Gain

- 8.8.28 The Applicant is developing a Biodiversity Net Gain (‘BNG’) Implementation Plan for the project which provides an overview of the approach to enable delivery of BNG and informs consultation with stakeholders. Currently, mandatory BNG is only applicable down the mean low water line. There is currently no legal requirement for Marine Net Gain. Further details are provided in chapter 6 terrestrial biodiversity of this Scoping Report.

### Habitats Regulations Assessment

- 8.8.29 A separate HRA under the requirements of The Conservation of Habitats and Species Regulations 2017 (as amended) will be undertaken to assess

any likely significant effects from the Proposed Development. The following sites will be included within the HRA:

- SACs.
- SPAs.
- Proposed SACs.
- Potential SPAs.
- Ramsar sites (both listed and proposed).
- Sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation.

8.8.30 Further details are provided in chapter 6 terrestrial biodiversity of this Scoping Report.

### **Water Framework Directive ('WFD') Assessment**

8.8.31 A standalone WFD Compliance Assessment will be submitted as part of the DCO application to:

- Assess potential for deterioration.
- Determine effects on WFD biological, chemical and hydromorphological quality elements.
- Confirm compliance with River Basin Management Plan objectives.
- Identify mitigation to ensure no deterioration.

8.8.32 Further details are provided in chapter 9 water environment of this Scoping Report.

### **Marine Conservation Zone ('MCZ') Assessment**

8.8.33 An MCZ screening assessment will be submitted as part of the DCO application to determine:

- If the Proposed Development is within or near an area designated as an MCZ.
- If the Proposed Development will have an effect on protected features of the MCZ or any ecological or geomorphological processes on which the conservation of any protected feature of an MCZ is dependent.

- 
- 8.8.34 A stage 1 MCZ will be required if screening determines that the Proposed Development will have an effect on the protected features of an MCZ.

## **8.9 Summary of Impacts and Effects**

- 8.9.1 Table 8-10 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the marine biodiversity chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 8-10: Summary of Marine Biodiversity Scope

| Receptor                                                                                    | Effects                                                                                                                                                                                                                 | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                     | Scoped in/Scoped out |
|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Construction Phase</b>                                                                   |                                                                                                                                                                                                                         |                       |                                    |                                                |                                                                                                                                                                                                                                                                                |                      |
| Designated sites (including international sites, SSSIs, and non-statutory designated sites) | Disturbance (such as displacement from underwater noise) to qualifying species and species which support qualifying species. Direct habitat loss. Changes to water quality and sedimentation. Pollution and spill risk. | Medium                | Up to International                | Significant                                    | Timings of works to accommodate qualifying species. Use of suitable working methods and construction techniques to reduce noise and sedimentation effects. Implementation of measures set out in a CEMP in accordance with the OCEMP to be agreed with the relevant authority. | Scoped in            |
| Marine habitats                                                                             | Direct habitat loss and temporary disturbance. Changes to water quality and sedimentation. Pollution and spill risk. INNS introduction/spread.                                                                          | Medium                | Local - Regional                   | Significant                                    | Minimise habitat loss, INNS biosecurity protocol. Pollution risk reduction protocols followed. Design to avoid most sensitive habitats. Implementation of measures set out in a CEMP in accordance with the OCEMP to be                                                        | Scoped in            |

| Receptor                                                                | Effects                                                                                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                      | Scoped in/Scoped out |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                                                                         |                                                                                                                                                                                                                                                                                 |                       |                                     |                                                | agreed with the relevant authority.                                                                                                                                                                                             |                      |
| Benthic species                                                         | Potential direct mortality to sessile species, disturbance and displacement of species, changes to water quality and sedimentation with potential for to cause smothering and disturb invertebrate physiology and behaviour Pollution and spill risk. INNS introduction/spread. | Low                   | Local - Regional                    | Significant                                    | Minimise disturbance through construction use and working methods. Design to avoid most sensitive habitats. Implementation of measures set out in a CEMP in accordance with the OCEMP to be agreed with the relevant authority. | Scoped in            |
| Fish and shellfish (including migratory and commercial species of fish) | Potential direct disturbance and displacement of species, changes to water quality and sedimentation with potential for visual barrier. Noise. Habitat loss.                                                                                                                    | Low                   | Local - Regional                    | Significant                                    | Minimise disturbance through construction use and working methods. Use of best practice guidance. Design to avoid most sensitive habitats. Implementation of measures set out in a                                              | Scoped in            |



| Receptor                                                                  | Effects                                                                                                                                                                                                          | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                              | Scoped in/Scoped out                           |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|                                                                           | Pollution and spill risk. INNS introduction/spread.                                                                                                                                                              |                       |                                    |                                                | CEMP in accordance with the OCEMP to be agreed with the relevant authority.                                                                                                                                                                                                             |                                                |
| Marine mammals                                                            | Potential direct disturbance and displacement of species, changes to water quality and sedimentation with potential for visual barrier. Noise. Habitat loss. Pollution and spill risk. INNS introduction/spread. | Low                   | Local - Regional                   | Significant                                    | Minimise disturbance through construction use and working methods. Use of best practice noise guidance for marine mammals. Design to avoid most sensitive habitats. Implementation of measures set out in a CEMP in accordance with the OCEMP to be agreed with the relevant authority. | Scoped in                                      |
| <b>Operational Phase</b>                                                  |                                                                                                                                                                                                                  |                       |                                    |                                                |                                                                                                                                                                                                                                                                                         |                                                |
| Designated sites (including international sites, SSSIs, and non-statutory | Changes to water quality. Disturbance during maintenance activities to designated species.                                                                                                                       | Low                   | Up to International                | Significant                                    | Design of outfall to minimise water quality changes (through dispersion). Maintenance activities to be timed around                                                                                                                                                                     | Scoped in (MCZ scoped out due to distance from |

| Receptor          | Effects                                                                                    | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                           | Scoped in/Scoped out                                                        |
|-------------------|--------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| designated sites) |                                                                                            |                       |                                     |                                                | sensitive windows. Maintenance works to use best practice to reduce disturbance.                                                                                                                     | Proposed Development (MCZ screening assessment to provide further detail)). |
| Habitats          | Changes to water quality. Disturbance during maintenance activities to designated species. | Low                   | Local - Regional                    | Significant                                    | Design of outfall to minimise water quality changes (through dispersion). Maintenance activities to be timed around sensitive windows. Maintenance works to use best practice to reduce disturbance. | Scoped in                                                                   |
| Benthic species   | Changes to water quality. Disturbance during maintenance activities to designated species. | Low                   | Local - Regional                    | Significant                                    | Design of outfall to minimise water quality changes (through dispersion). Maintenance activities to be timed around sensitive windows. Maintenance works to                                          | Scoped in                                                                   |

| Receptor                                                                | Effects                                                                                    | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                           | Scoped in/Scoped out |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                                                                         |                                                                                            |                       |                                    |                                                | use best practice to reduce disturbance                                                                                                                                                              |                      |
| Fish and shellfish (including migratory and commercial species of fish) | Changes to water quality. Disturbance during maintenance activities to designated species. | Low                   | Local - Regional                   | Significant                                    | Design of outfall to minimise water quality changes (through dispersion). Maintenance activities to be timed around sensitive windows. Maintenance works to use best practice to reduce disturbance. | Scoped in            |
| Marine mammals                                                          | Changes to water quality. Disturbance during maintenance activities to designated species. | Low                   | Local - Regional                   | Significant                                    | Design of outfall to minimise water quality changes (through dispersion). Maintenance activities to be timed around sensitive windows. Maintenance works to use best practice to reduce disturbance. | Scoped in            |
| <b>Decommissioning Phase</b>                                            |                                                                                            |                       |                                    |                                                |                                                                                                                                                                                                      |                      |
| Designated sites (including                                             | Disturbance (such as displacement                                                          | Medium                | Up to International                | Significant                                    | Timings of works to accommodate qualifying                                                                                                                                                           | Scoped in            |

| Receptor                                                        | Effects                                                                                                                                                                               | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                        | Scoped in/Scoped out                                                                                                                                                           |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| international sites, SSSIs, and non-statutory designated sites) | from underwater noise) to qualifying species and species which support qualifying species. Direct habitat loss. Changes to water quality and sedimentation. Pollution and spill risk. |                       |                                     |                                                | species. Use of suitable working methods and construction techniques to reduce noise and sedimentation effects. Decommissioning Environmental Management Plan ('DEMP') will be agreed with the relevant authority | (MCZ scoped out due to distance from Proposed Development (MCZ screening assessment to provide further detail)) and non-statutory designated sites scoped out due to distance) |
| Habitats                                                        | Direct habitat loss and temporary disturbance. Changes to water quality and sedimentation. Pollution and spill                                                                        | Medium                | Local - Regional                    | Significant                                    | Minimise habitat loss, INNS biosecurity protocols. Pollution risk reduction protocols followed. Design to avoid most sensitive habitats. DEMP will be                                                             | Scoped in.                                                                                                                                                                     |

| Receptor                                                                | Effects                                                                                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                  | Scoped in/Scoped out                         |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
|                                                                         | risk. INNS introduction/spread.                                                                                                                                                                                                                                                 |                       |                                     |                                                | agreed with the relevant authority                                                                                                                          |                                              |
| Benthic species                                                         | Potential direct mortality to sessile species, disturbance and displacement of species, changes to water quality and sedimentation with potential for to cause smothering and disturb invertebrate physiology and behaviour Pollution and spill risk. INNS introduction/spread. | Low                   | Local - Regional                    | Significant                                    | Minimise disturbance through construction use and working methods. Design to avoid most sensitive habitats. DEMP will be agreed with the relevant authority | Scoped in (commercial shellfish scoped out). |
| Fish and shellfish (including migratory and commercial species of fish) | Potential direct disturbance and displacement of species, changes to water quality and sedimentation with potential for visual barrier. Noise. Habitat loss.                                                                                                                    | Low                   | Local - Regional                    | Significant                                    | Minimise disturbance through construction use and working methods. Use best practice guidance. Design to avoid most sensitive habitats. DEMP will be agreed | Scoped in (commercial shellfish scoped out). |

| Receptor       | Effects                                                                                                                                                                                                          | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                           | Scoped in/Scoped out |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                | Pollution and spill risk. INNS introduction/spread.                                                                                                                                                              |                       |                                    |                                                | with the relevant authority.                                                                                                                                                                                         |                      |
| Marine mammals | Potential direct disturbance and displacement of species, changes to water quality and sedimentation with potential for visual barrier. Noise. Habitat loss. Pollution and spill risk. INNS introduction/spread. | Low                   | Local - Regional                   | Significant                                    | Minimise disturbance through construction use and working methods. Use of best practice noise guidance for marine mammals. Design to avoid most sensitive habitats. DEMP will be agreed with the relevant authority. | Scoped in.           |

## 9 Water Environment

### 9.1 Introduction

9.1.1 This chapter presents the proposed scope and methodology for the assessment of the likely significant effects arising from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on the water environment, including designated sites and water-dependent habitats. The assessment will be presented within an Environmental Statement (‘ES’) submitted in support of the application for a Development Consent Order (‘DCO’). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.

9.1.2 The EIA Scoping Area is illustrated on Figure 1-1. This chapter should be read in conjunction with the following chapters of the Scoping Report:

- Chapter 2 The Proposed Development.
- Chapter 3 EIA Methodology.
- Chapter 6 Terrestrial Biodiversity.
- Chapter 7 Freshwater Biodiversity.
- Chapter 8 Marine Biodiversity.
- Chapter 16 Climate Change.
- Chapter 19 Ground Conditions.
- Chapter 20 Agricultural Land and Soils.
- Chapter 22 Major Accidents and Disasters.

9.1.3 This chapter discusses the proposed scope of the water environment assessment that will be undertaken for the ES. It describes the baseline water environment with regard to the following elements:

- Surface water, which covers surface water resources, surface water quality and hydromorphology (including rivers, streams, land / field

drains, lakes, reservoirs, ponds, transitional and coastal waters up to Mean High Water Springs ('MHWS')).

- Flood risk to and from the Proposed Development from fluvial, pluvial (surface water), coastal, groundwater, reservoir and sewer sources.
- Groundwater, which includes groundwater resources, groundwater quality, quantity, flows and dependent habitats.

9.1.4 The assessment will identify and evaluate water environment receptors and the potentially significant effects that could arise from the construction, operational and decommissioning phases of the Proposed Development, and identify the mitigation measures required to reduce these effects on the water environment.

9.1.5 This chapter has been undertaken by a Chartered Water and Environmental Manager ('C.WEM') with the Chartered Institution of Water and Environmental Management ('CIWEM'). They have 15 years' experience in water environment related impact assessment and hold a degree in Physics (BSc (Hons)) and a MSc in Applied Meteorology. They have experience of preparing assessments of effects on the water environment for Nationally Significant Infrastructure Projects ('NSIPs') under the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, including for water resources infrastructure projects.

9.1.6 Appendix 9.1 sets out the legislation, policy and guidance relevant to the water environment chapter of the ES. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

## 9.2 Study Area

9.2.1 The EIA Scoping Area is located within the Anglian River Basin District and is within the Broadland Rivers and the Suffolk East management catchments. The components of the Proposed Development will be located in several different operational catchments and could interact with various water bodies and watercourses, areas of flood risk, groundwater receptors and other surface water receptors (such as ponds) within them. Chapter 2



of this Scoping Report provides further details regarding the location and description of the Proposed Development.

- 9.2.2 The proposed study area encompasses all groundwater and surface water bodies/watercourses, flood risk areas and other relevant groundwater and surface receptors that may be directly or indirectly affected by the Proposed Development. The proposed study area comprises the EIA Scoping Area plus a 1km radius. The exception to this is north of Shipmeadow, where the study area has been extended eastwards to include the existing Barsham WTW abstraction point and a stretch, approximately 500m in length, of the River Waveney downstream of this abstraction point to account for potential changes to the existing flow of the river during the Proposed Development's operational phase. Water environment receptors within the study area are assumed to have the potential to be either directly or indirectly impacted by the construction, operational and decommissioning phases of the Proposed Development. It should be noted that the study area extent will be kept under review and may be altered if further information or evidence concerning the source-pathway-receptor relationships become available.
- 9.2.3 Potential effects on marine and coastal waters arising from the Proposed Development will be assessed with the marine biodiversity chapter of the ES (refer to chapter 8 of this Scoping Report for further details).
- 9.2.4 The water environment chapter of the ES will provide the following supporting assessments (refer to Section 9.9) including: a Flood Risk Assessment ('FRA'), Water Framework Directive [1] ('WFD') Compliance Assessment and a Hydrogeological Impact Assessment. This approach avoids duplication while ensuring full regulatory compliance.
- 9.2.5 The study area will be refined throughout the evolution of the design of the Proposed Development. However, it is anticipated that the study area for the ES will be the proposed Order Limits plus the same radius as described above.

- 9.2.6 For the purposes of this assessment, the study area will be divided into sections of the EIA Scoping Area based on the Proposed Development's components, for ease of reference. For the avoidance of doubt, the 1km radius is applied to each section of the EIA Scoping Area.

### 9.3 Consultation and Engagement

- 9.3.1 The majority of information regarding the water environment is publicly available. Where information is not available, consultation with statutory bodies may also be required. Statutory consultees include, but are not limited to, the following:
- Environment Agency ('EA').
  - Natural England ('NE').
  - County Councils (Norfolk County Council ('NCC'), Suffolk County Council ('SCC')).
  - District Councils (Great Yarmouth Borough Council ('GYBC'), South Norfolk District Council ('SNDC'), East Suffolk Council ('ESC') and Mid Suffolk District Council ('MSDC')).
  - Broads Authority ('BA').
  - Internal Drainage Boards ('IDBs') (Waveney, Lower Yare and Lothingland IDB and East Suffolk IDB).
  - Rivers Trust.
  - Norfolk & Suffolk Nature Recovery Partnership.
  - Wildlife Trusts.
- 9.3.2 Since June 2025, the Applicant has held monthly virtual meetings with representatives from the EA and NE, referred to as the 'Environmental Stakeholder Forum'. These meetings have included discussions on the proposed approach to the assessment of the Proposed Development's likely significant effects on the water environment.
- 9.3.3 In addition to the EA and NE, the Applicant will engage with other stakeholders throughout the EIA process, including Local Planning Authorities ('LPAs') and local communities.
- 9.3.4 A topic-specific water environment virtual meeting was held on 12 March 2026 with the EA and LPAs, comprising SCC, ESC, MSC, SNDC, GYBC,

NCC and BA. The matters discussed included the proposed approach to the scope of the assessment in the ES, as well as requirements for baseline data and surveys. The key interactions of the Proposed Development on the water environment were also discussed. No comments on the proposed approach were made by the stakeholders listed above.

## 9.4 Baseline Environment

9.4.1 The baseline conditions in relation to the water environment within the study area are outlined within the sections below. It should be read in conjunction with the following figures:

- Figure 9-1: Surface Water Features.
- Figure 9-2: Designated Sites.
- Figure 9-3: Groundwater Features.
- Figure 9-4: Superficial Geology.
- Figure 9-5: Bedrock Geology.
- Figure 9-6: Water Resources.
- Figure 9-7: Flood Zones 2 and 3.
- Figure 9-8: Risk of Flooding from Rivers, Sea and Climate Change.
- Figure 9-9: Risk of River of Flooding from Surface Water.
- Figure 9-10: Risk of Flooding from Surface Water and Climate Change.

### Baseline Data Sources

9.4.2 A desk-based assessment of available data sources has been used to inform the baseline assessment presented in this chapter of the Scoping Report. This comprises, but is not limited to, the following:

- Aerial / satellite imagery.
- Open Street Map [2].
- EA Hydrology Data Explorer [3].
- EA Catchment Data Explorer [4].
- EA Water Quality Explorer [5].
- Multi-Agency Geographic Information for the Countryside ('MAGIC') map service [6].
- National River Flow Archive ('NRFA') [7].

- Flood Estimation Handbook ('FEH') Web Service [8].
- Ordnance Survey ('OS') Historical Mapping [9].
- Light Detection and Ranging ('LiDAR') data [10].
- EA Flood Map for Planning ('FMfP') [11].
- Long-term flood risk for an area in England [12].
- EA's Groundwater Dependent Terrestrial Ecosystems (England only) [13]
- Recorded Flood Outlines [14].
- Anglian River Basin District Flood Risk Management Plan 2021 to 2027 [15] (2022).
- Geoindex Onshore [16].
- Consented Discharges to Controlled Waters (England) [17].
- Water Abstraction Licences [18].
- UK Centre for Ecology and Hydrology ('UKCEH') UK Lakes Portal [19].

9.4.3 It should be noted that several information sources have not been obtained for the preparation of this chapter of the Scoping Report. These would be requested at a later date to support the assessment in the water environment chapter of the ES. This relates to private water supplies ('PWS') and additional information on unlicensed abstractions and discharges held by local authorities and IDBs, as well as groundwater flooding information held by the British Geological Survey ('BGS').

9.4.4 Water environment receptors are broken down into geographical areas, referred to as 'sections of the EIA Scoping Area', based on the following components of the Proposed Development (refer to Figure 1-3):

- Proposed Advanced Water Recycling Plant ('AWRP').
- Proposed Long Sea Outfall ('LSO').
- Proposed Central Service Reservoir ('CSR').
- Proposed Western Service Reservoir ('WSR').
- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
- Proposed CSR to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C ('SZC') Pipeline.

- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

## Proposed AWRP

### Statutory Designations

- 9.4.5 There are no international sites or nationally designated nature conservation sites (Special Areas of Conservation ('SACs'), Special Protection Areas ('SPAs'), Ramsar, or Sites of Special Scientific Interest ('SSSIs')) within the proposed AWRP study area [20].
- 9.4.6 Groundwater Dependent Terrestrial Ecosystems ('GWDTEs') will be discussed in the groundwater section below.

### Surface Water Receptors

- 9.4.7 The largest ordinary surface water receptor within the proposed AWRP study area is the headwater watercourse associated with the upper reaches of Fritton Lake, named on local mapping as 'Hopton Run'. Its source is located approximately 50m from the proposed AWRP section of the EIA Scoping Area. This upstream reach comprises a low-gradient, slow flowing watercourse with an artificial, historical fish pond near to the source [21]. The watercourse then flows through a series of agricultural field drains before widening into Mill Water, Middle Water, College Basin and Lound Run Ponds. These water bodies form the WFD Lound Mill Water Body (GB30536980) [22]. Further downstream, the watercourse opens out into Fritton Lake, also known as Fritton Decoy, an approximately 3km long artificial lake [23]. This lake is designated as the WFD Fritton Decoy Water Body (GB30536989) [24].
- 9.4.8 There is riparian broadleaved, mixed woodland present along the entire length of the Hopton Run. This also applies to the sections which flow through the agricultural field drains. Wider land use is dominated by grasslands and agricultural land, with some urban areas, such as Hopton-on-Sea to the east [25].

- 9.4.9 To the east of the proposed AWRP section of the EIA Scoping Area is the North Sea coast, characterised with sandy beaches and dynamic, erosive tides. It is part of the WFD Norfolk East Water Body (GB650503520003) [26].
- 9.4.10 There is a Statutory Main River ('SMR') which is the upper headwaters of The Fleet, a tributary of the River Waveney, which falls within the proposed AWRP study area. This watercourse appears to originate from a combination of drains around the A47, flowing southwest past Flixton.
- 9.4.11 There are no additional agricultural field drains or canals present within the proposed AWRP study area [27].

#### *Surface Water Supply*

- 9.4.12 According to the EA Water Abstraction Licenses Mapping, there are no surface water abstraction points within the proposed AWRP study area [28].
- 9.4.13 As outlined in paragraph 9.4.3, additional data regarding surface water abstractions, discharges and PWS will be requested to inform the assessment in the water environment chapter of the ES.

#### *Hydromorphology*

- 9.4.14 Comparison of the most recent mapping with historical mapping from 1884 [29] suggests that the upper reaches of the Fritton Lake and Hopton Run have remained largely unchanged at a catchment scale, despite some localised modifications. A greater number of ponds are located upstream of the section of the watercourse influenced by agricultural field drains. However, the historical mapping indicates that these ponds were likely artificially constructed, with sections of the watercourse formerly confined to drains and adjacent land annotated as 'liable to flooding'. This change appears to have taken place between 1884 and 1906, with the 1906 mapping illustrating substantial changes in channel form [30]. The maps show the presence of dams at multiple locations along the watercourse until it reaches Fritton Decoy. Since 1906, there has been limited change to the

watercourse, suggesting that the area is likely subject to ongoing management and modification.

- 9.4.15 The watercourse is culverted beneath roads, resulting in the narrowing of the channel creating a hydraulic constraint. Within sections influenced by agricultural field drains, the channel exhibits a straightened planform with limited evidence of natural geomorphological features [31].

#### *Surface Water Quality*

- 9.4.16 Although the Fritton Decoy and Lound Mill Water Bodies fall outside of the AWRP study area, they have been included to provide context on the water quality within the surrounding area. The UKCEH Lakes Portal shows two water quality sampling points on the Lound Mill Water Body and one on the Fritton Decoy Water Body [32].
- 9.4.17 provides a summary of these data, which suggests the eutrophic lakes have elevated nutrients levels, such as phosphate and nitrate. The average dissolved oxygen levels suggest potentially well-oxygenated conditions.

Table 9-1: Average UKCEH Lakes Portal Water Quality Data for Fritton Decoy and Lound Mill.

| Water Body       | Water Quality Parameter                      |                            |                        |
|------------------|----------------------------------------------|----------------------------|------------------------|
|                  | Phosphate<br>(milligrams per<br>litre, mg/L) | Dissolved Oxygen<br>(mg/L) | Nitrate as N<br>(mg/L) |
| Fritton Decoy    | 0.2                                          | 11.6                       | N/A                    |
| Lound Mill Water | 0.08                                         | 11.4                       | 5.1                    |

- 9.4.18 The WFD classifies surface water bodies in England on a scale ranging from ‘high’ (best condition) to ‘bad’ (worst condition) ecological status. Generally, this status assignment is based on information from monitoring of water quality and biological quality elements. The WFD Fritton Decoy Water Body (GB30536989) has been classified as having an overall ‘bad’ ecological status (as part of WFD Cycle 3 Classification [33]), with reasons

for not achieving ‘good’ (‘RNAG’) ecological status due to physical modifications, diffuse and point source pollution from agricultural land, water industry assets and transport sources [34]. Aerial imagery shows that large sections of the watercourse have dense areas of in-channel vegetation [35].

- 9.4.19 The WFD Lound Mill Water Body (GB30536980) has been classified as having ‘poor’ ecological status (as part of WFD Cycle 3 Classification), with RNAG due to pressures on flow as a result on groundwater abstraction which impacts the hydrological regime. Additionally, pollution from agriculture and sewage discharges is causing pressures on phytoplankton and phosphate levels [36].
- 9.4.20 The WFD Norfolk East Water Body (GB650503520003) is designated as a heavily modified water body (‘HMWB’) and classified as having ‘moderate’ ecological status. The water body was classified as having ‘moderate’ status for dissolved inorganic nitrogen and ‘high’ status for dissolved oxygen [37]. RNAG is linked to pressures from point and diffuse pollution sources from the water industry as well as agricultural and rural land management.
- 9.4.21 There is one consented discharge site within the AWRP study area (Permit ID: PR4LF1115) which relates to the discharge sewage to a soakaway [38].

### Groundwater Receptors

- 9.4.22 BGS mapping [39] indicates that the superficial deposits underlying the majority of the proposed AWRP section of the EIA Scoping Area comprises Happisburgh Glacigenic Formation (sand), with small exposures of the Lowestoft Formation (Diamicton) and Head (clay, silt, sand and gravel).
- 9.4.23 Within the AWRP study area, there is additional mapped exposures of:
- Corton Woods Sand and Gravel Member (sand and gravel).
  - Lacustrine deposits (clay and silt).
  - Alluvium (clay, silt, sand and gravel).
  - Breydon Formation (peat).
  - Lowestoft Formation (sand and gravel).



- 
- Happisburgh Glacigenic Formation (diamicton).
  - Crag Group and Bytham Sand and Gravel Formation (Undifferentiated).
- 9.4.24 The bedrock geology underlying the entirety of the proposed AWRP study area comprises the Crag Group (sand and gravel) [40].
- 9.4.25 The majority of the superficial deposits beneath the proposed AWRP section of the EIA Scoping Area are classified by the EA as a Secondary A aquifer, while the Lowestoft Formation and the Head deposits (clay, silt, sand and gravel) are classified as a secondary (undifferentiated) aquifer [41]. Secondary A aquifers comprise permeable layers capable of supporting local water supplies and contributing to river baseflow. Secondary (undifferentiated) aquifers describe strata where it is not possible to assign a secondary A or B designation due to variable lithological characteristics, as a result their groundwater potential is generally minor [42].
- 9.4.26 The Crag Group (sand and gravel) is designated by the EA as a principal aquifer [43]. Principal aquifers provide significant quantities of drinking water, and water for business needs. They may also support baseflows to rivers, lakes and wetlands [44].
- 9.4.27 The proposed AWRP study area is located within the Broadland Rivers Chalk and Crag WFD groundwater body (GB40501G400300). This WFD groundwater body is classified as having a 'poor' overall status. RNAG comprise two data quality issues (suspect data) affecting Trend Assessment [45] and the Chemical Drinking Water Protected Area elements, and one flow related pressure from agricultural groundwater abstraction affecting the Quantitative GWDTEs test [46], [47].
- 9.4.28 The entire proposed AWRP section of the EIA Scoping Area is situated within a designated medium - high groundwater vulnerability zone [48]. Within the groundwater vulnerability framework, this category represents areas where ground conditions allow a moderate to high degree of pollutant leaching, sitting between high vulnerability zones (where pollutants can
-

- 
- readily reach groundwater) and moderate vulnerability areas (that offer some groundwater protection).
- 9.4.29 Within the proposed AWRP study area, there are two notable stretches of low groundwater vulnerability, which appear to align with the Happisburgh Glacigenic Formation (Diamicton), Breydon Formation and Lacustrine deposits. These low vulnerability areas reflect geological, soil and hydrological conditions that provide maximum protection to underlying aquifers against pollution.
- 9.4.30 There are no Drinking Water Safeguard Zones (Groundwater) ('SgZs') within the proposed AWRP study area.
- 9.4.31 There are no statutory designated nature conservation sites (as outlined in paragraph 9.4.5) within the proposed AWRP study area. This aligns with the EA's GWDTE dataset [49] which confirm that there are no SSSIs classified as a GWDTE. However, it is possible that wetland habitats with a national non-statutory designation, or no designation, are present and which could constitute GWDTE classification. These will be identified through the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.
- 9.4.32 Review of the EA's Source Protection Zone ('SPZ') map indicates that the proposed AWRP study area does not lie within a designated SPZ [50]. The proposed AWRP section of the EIA Scoping Area is located within a Nitrate Vulnerable Zone ('NVZ') [51].
- 9.4.33 There is one consented discharge to ground within the proposed AWRP study area, which is discussed in paragraph 9.4.21.
- 9.4.34 There is one licenced groundwater abstraction within the proposed AWRP study area which is outlined in Table 9-2. There may also be PWSs operating within the proposed AWRP study area, this information will be requested from the relevant Local Authority as part of the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.
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Table 9-2: Licenced Groundwater Abstractions within the Proposed AWRP Study Area

| Licence Number  | National Grid Reference ('NGR') | Maximum Annual Quantity (m <sup>3</sup> ) | Maximum Daily Quantity (m <sup>3</sup> ) | Purpose                 |
|-----------------|---------------------------------|-------------------------------------------|------------------------------------------|-------------------------|
| 7/34/19/*G/0094 | TM 51400<br>99600               | 15,900                                    | 109                                      | Spray irrigation-direct |

## Flood Risk

### Fluvial

- 9.4.35 The EA's FMfP [52] indicates that there are areas of Flood Zone 3 (greater than 1% (1 in 100) Annual Exceedance Probability ('AEP') risk of fluvial flooding or 0.5% (1 in 200) AEP risk of flooding from the sea) and Flood Zone 2 (between 0.1% (1 in 1,000) and 1% (1 in 100) AEP risk of fluvial flooding or 0.1% (1 in 100) to 0.5% (1 in 200) AEP risk of flooding from the sea) in the proposed AWRP study area. The Flood Zones within the proposed AWRP study area are associated with the unnamed tributary of the River Waveney and its tributary in the south of the proposed AWRP study area, and from the North Sea in the east.
- 9.4.36 Flood Zone 3b (the functional floodplain) is defined by the Lead Local Flood Authority ('LLFA'), within their respective Strategic Flood Risk Assessments ('SFRA'). A review of the relevant SFRAs [53], [54] indicate that the proposed AWRP section of the EIA Scoping Area and study area are not located within Flood Zone 3b.
- 9.4.37 Climate change will have a direct impact on fluvial flood risk. To lessen the risks, the future impacts of climate change must be considered. Fluvial flood risk mapping with climate change considerations is also available [55]. The mapping considers how climate change will impact flood risk through its alteration of peak river flow, sea level rise, offshore wind speed and extreme wave level height. Areas of high (3.3% (1 in 30) AEP or greater) and medium (between a 3.3% (1 in 30) and 1% (1 in 100) AEP) risk correlate with Flood Zone 3, whilst low (between a 1% (1 in 100) and 0.1% (1 in 1,000) AEP) correlates with Flood Zone 2. The mapping indicates that

areas of medium risk may become associated with high-risk events but have not significantly increased in extent.

### Surface Water

- 9.4.38 The EA Risk of Flooding from Surface Water ('RoFSW') [56] mapping shows the surface water flood risk associated with high (3.3% (1 in 30) AEP event), medium (1% (1 in 100) AEP event) and low (0.1 (1 in 1,000) AEP event) risk events.
- 9.4.39 The mapping indicates that there are areas of high – low risk for surface water flooding as well as isolated areas of ponding in the AWRP section of the EIA Scoping Area and study area. In addition to this, during low-risk events, overland flow pathways connect areas of ponding, spanning from the south of proposed AWRP section of the EIA Scoping Area to the westernmost extent. There is one small area of ponding in the south of the proposed AWRP section of the EIA Scoping Area associated with a high – low risk for surface water flooding, which correlates with a localised depression in the land.
- 9.4.40 There are areas of high to low surface water flood risk across the proposed AWRP section of the EIA Scoping Area. In high to medium risk flooding events, the predicted flooding is generally attributed to localised ponding rather than significant flow paths.
- 9.4.41 Climate change will have a direct impact on surface water flood risk. Surface water flooding mapping that considers the impact of climate change, RoFSW + climate change ('CC') [57] has also been evaluated. The mapping indicates that areas of ponding will increase in extent, with larger areas now associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated.

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## Groundwater

- 9.4.42 The East Suffolk SFRA [58] uses the BGS Susceptibility to Groundwater Flooding dataset, which indicates that the proposed AWRP section of the EIA Scoping Area and the south of the AWRP study area are classified as having *‘limited potential for groundwater flooding to occur’*. The Great Yarmouth SFRA [59] uses the BGS Areas Susceptible to Groundwater Flooding (‘AStGWF’) dataset, which shows a small portion of the northeast of the proposed AWRP study area is classified as *‘land with <25% susceptibility to groundwater flooding’*.
- 9.4.43 However, these datasets are only intended to provide an indication of where groundwater might emerge and do not show the likelihood of groundwater flooding occurring. Consequently, site-specific groundwater flood risk will be assessed during the next stage of the EIA process to inform the assessment in the water environment chapter of the ES.

## Reservoir

- 9.4.44 EA Reservoir Flood Risk mapping [60], [61] indicates areas at risk of flooding if there were to be a breach of a reservoir falling under the auspices of the Reservoirs Act 1975 [62] (reservoirs with a capacity greater than 25,000m<sup>3</sup>). The mapping provides scenarios for ‘dry day’ (when there is no fluvial flooding) and ‘wet day’ (when there is also fluvial flooding present) reservoir flood events.
- 9.4.45 The mapping indicates that the proposed AWRP section of the EIA Scoping Area and study area are located outside of risk extents for both dry and wet days. Therefore, there is no risk of flooding anticipated from this source.

## Other Sources

### Tidal

- 9.4.46 The nearest tidal influenced watercourse to the proposed AWRP section of the EIA Scoping Area and study area is Oulton Dyke, which is connected to the River Waveney. The tidal limit of the River Waveney is Ellingham Mill [63], upstream of the proposed AWRP section of the EIA Scoping Area and

study area. The proposed AWRP section of the EIA Scoping Area and study area are located within mapped fluvial Flood Zones associated with the River Waveney. Therefore, there is a risk of flooding anticipated from this source.

- 9.4.47 A review of the relevant Local Authority SFRAs [64] indicates that tidal storm surges have been recorded from as early as 1888. While the tidal flooding incidents documented within the East Suffolk SFRA do not provide specific locations and are described more generally along the East Suffolk coastline, they demonstrate the presence of a wider tidal flood risk in the area which may influence water levels within the River Waveney and its connected watercourses.

#### *Canal*

- 9.4.48 A review of canal mapping [65] indicates that there are no canals in the vicinity of the proposed AWRP section of the EIA Scoping Area and study area. Therefore, no flood risk is anticipated from this source.

#### *Historic*

- 9.4.49 The EA's Recorded Flood Outlines [66] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising records from as early as 1946. The mapping does not show any flooding incidents recorded within the proposed AWRP section of the EIA Scoping Area and study area.
- 9.4.50 A review of the relevant Local Authority SFRAs [67], [68] indicates that historic flooding has been recorded more widely within the Great Yarmouth Borough and East Suffolk District. However, no specific flood incidents were identified within the proposed AWRP section of the EIA Scoping Area and study area in the SFRAs. The most common recorded flood source is tidal flooding from storm surges, although historical events also include tidal, fluvial, surface water and sewer, as well as combined sources (tidal and fluvial, surface water and fluvial).

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## Proposed LSO

### Statutory Designations

- 9.4.51 The LSO study area is within the Outer Thames Estuary SPA. This area is designated as it provides a habitat for the largest group (38%) of wintering red-throated divers (*Gavia stellata*) in the UK. Additionally, this area is important for common terns (*Sterna Hirundo*) and little terns (*Sternula albifrons*) [69]. This designated site has existing pressures from commercial fishing such as physical damage to the sandbank habitats and fishing gear causing entanglement for the diving birds [70].
- 9.4.52 This section of the coast is also designated as the Southern North Sea SAC due to being an important area for harbour porpoises (*Phocoena phocoena*) [71]. It is currently reported as being in favourable condition, based on the latest published site condition information (updated in March 2023) [72]. However, some potential impacts have been listed for the site such as entanglement, contaminants, anthropogenic underwater sound, reduction in prey resources and collision with vessels or installations.
- 9.4.53 Corton Cliffs SSSI falls within the proposed LSO study area. This site is designated for its earth heritage importance, such as glacial features [73].
- 9.4.54 There are two locally designated sites within the LSO study area (Local Nature Reserves ('LNRs')) in the area. The first, Gunton Warren and Corton Woods, lies within the proposed LSO section of the EIA Scoping Area, with the second, Gunton Wood, located within the LSO study area [74].
- 9.4.55 GWDTes will be discussed in the groundwater section below.

### Surface Water Receptors

- 9.4.56 The North Sea has direct interaction with the proposed LSO section of the EIA Scoping Area. This section of the coast is covered by the WFD Norfolk East Water Body (GB650503520003) and the WFD Suffolk Water Body (GB650503520002) [4].

- 9.4.57 There are no SMRs within the terrestrial area of the proposed LSO section of the EIA Scoping Area. However, the upper headwaters of The Fleet, a tributary of the River Waveney falls within the LSO study area. This watercourse has been previously described in paragraph 9.4.10. There is an additional SMR which falls within the study area of the proposed LSO section of the EIA Scoping Area which flows west, through the lake at Gunton Hall, and joins the upper headwaters of The Fleet [75].
- 9.4.58 Review of mapping indicates the presence of a number of ditches to the north of Hopton-on-Sea, associated with the Gorleston Golf Course [76]. There is also the presence of ponds in the Hopton Holiday Village caravan park which appear to be used recreationally [77]. Within a housing estate in Hopton-on-Sea, there is a pond named ‘Balancing Pond’. Furthermore, an additional pond has been identified to the east of the A47 which appears to be associated with the grounds of Hopton Manor [78]. There is also a large freshwater lake located near Gunton Hall. According to the UKCEH UK Lakes Portal, this body of water has a surface area of 9ha and is approximately 1m deep [79].

#### *Surface Water Supply*

- 9.4.59 According to EA Water Abstraction Licenses Mapping, there are no surface water abstraction points within the LSO study area [80]. As outlined in paragraph 9.4.3, additional data on surface water abstractions, discharges and PWS will be requested to inform the assessment in the water environment chapter of the ES.

#### *Hydromorphology*

- 9.4.60 The upper reaches of The Fleet watercourse appear to have been modified, with sections where channel straightening may have occurred [81]. The watercourse is culverted at several locations beneath roads. However, there is no indication of significant engineered structures within the upper reaches.



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- 9.4.61 Surrounding land use is predominantly arable, with limited riparian vegetation and only occasional trees present [82]. Further downstream, the extent of riparian mixed broadleaved woodland increases.
- 9.4.62 The unnamed tributary within the upper headwaters of The Fleet watercourse is heavily managed, with several sections culverted beneath roads or constrained by bridge infrastructure. The watercourse discharges into a lake at Gunton Hall, where LiDAR data indicates possible reinforcement at the western end, suggesting historic or current impoundment [83]. Downstream of the lake, the watercourse passes beneath Yarmouth Road, with a portion of the flow diverted into a pond to the north. The watercourse is culverted again in this area [84].
- 9.4.63 Within the LSO study area, the seabed substrate is predominantly composed of sand and gravelly sand. The surrounding waters are relatively shallow, with depths of less than 10m extending to around 7km offshore, indicating a gently sloping coastal profile [85]. The Suffolk North coast experiences a semi-diurnal tide with a relatively small tidal range, averaging at around 1.9m to 2.5m [86]. The tides in this section of the North Sea are dynamic and erosive, prone to intense storm surges which have travelled down the east of England. These events can cause significant flooding on land, for example, a storm surge in 2013 in North Norfolk led to 116 households and 36 businesses being impacted by flooding [87].
- 9.4.64 Therefore, sea defences are common along this coastline, with revetments, rock armour and groynes along the shoreline within the LSO study area. These features are intended to reduce coastal erosion and provide protection to clifftop infrastructure. Revetments are sloping structures made of concrete, stone or wood, which run parallel to the shore to dissipate wave forces between sea and land. They disrupt the natural beach morphology by blocking natural sediment transfer and potentially reducing the size of habitats [88]. Groynes are designed to trap sediment and prevent longshore drift. However, they can often cause issues, such as preventing sediment
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being transported to beaches further down the coast. This can have consequences such as causing increased erosion in these areas.

- 9.4.65 Both the WFD Norfolk East Water Body and WFD Suffolk Water Body has been designated as being a HMWB under WFD Cycle 3 Classification data [89].

#### *Surface Water Quality*

- 9.4.66 There are multiple consented discharge points around the LSO study area which are outlined in Table 9-3 [90].

Table 9-3: Environment Agency Consented Discharge Points within the Proposed LSO Study Area

| Name of Site                                        | Permit Number | NGR          | Receiving Water Body        | Type of Outlet |
|-----------------------------------------------------|---------------|--------------|-----------------------------|----------------|
| Ness Point Pumping Station<br>Anglian Water ('AW')  | ASECS12403    | TM5546693710 | Sea                         | Sewage         |
| Lowestoft Water Recycling Centre<br>AW              | ASECS12405    | TM5612093710 | Sea                         | Sewage         |
| Holder Site<br>Lowestoft                            | PRELF1865     | TM5550093630 | In land/infiltration system | Trade          |
| Lowestoft Marina Combined Sewer Overflow<br>AW      | ASETS16991    | TM5513093030 | Sea                         | Sewage         |
| Corton - Church Lane Terminal Pumping Station<br>AW | ASECS15627    | TM5398498127 | Sea                         | Sewage         |
| Conway                                              | EPRTB3357TV   | TM5274997388 | Tributary of River Waveney  | Sewage         |

| Name of Site     | Permit Number | NGR          | Receiving Water Body            | Type of Outlet |
|------------------|---------------|--------------|---------------------------------|----------------|
| White House Farm | EPRCP3825XH   | TM5264597605 | Tributary of River Fleet        | Sewage         |
| Lowestoft Road   | PR4LF1115     | TM5250099700 | Into land / infiltration system | Sewage         |

9.4.67 Both the WFD Suffolk Water Body (GB650503520002) and WFD Norfolk East Water Body (GB650503520003) are classified as having ‘moderate’ ecological status and ‘moderate’ physico-chemical quality status. The water body was classified as having ‘moderate’ status for dissolved inorganic nitrogen and ‘high’ status for dissolved oxygen [91]. RNAG is linked to pressures from point and diffuse pollution sources from the water industry as well as agricultural and rural land management.

9.4.68 Although there are no designated bathing waters within the LSO study area, three are located in close proximity to it. A designated bathing area means that the EA regularly monitor the water quality of the area during the bathing season, which runs from May to the end of September. These sites can give an indication of water quality within these areas. One of these sites is Gorleston Beach, which is located approximately 1.3km north of the proposed LSO study area. In 2025, this site was classified as having ‘excellent’ bathing water quality [92]. The other sites are located to the south at Lowestoft (North of Claremont Pier) and Lowestoft (South of Claremont Pier), approximately 800m and 1.4km, respectively, from this section of the EIA Scoping Area. These sites had ‘good’ bathing water quality in 2025.

### Groundwater Receptors

9.4.69 BGS mapping [93] indicates the superficial deposits underlying the proposed LSO study area varies and includes:

- Beach deposits (sand and gravel).
- Corton Woods Sand and Gravel Member (sand and gravel).

- Happisburgh Glacigenic Formation (sand).
- Lowestoft Formation (Diamicton).
- Lowestoft Formation (sand and gravel).
- Head (clay, silt, sand and gravel).
- Happisburgh Glacigenic Formation (Diamicton).
- Blown Sand (sand).
- Lacustrine deposits (clay and silt).
- Breydon Formation (peat).

9.4.70 The bedrock geology underlying the entirety of the proposed LSO study area, comprises the Crag Group (sand and gravel) [94]. The majority of the superficial deposits beneath the proposed LSO section of the EIA Scoping Area is classified by the EA as a Secondary A aquifer, while the Lowestoft Formation and the Head deposits (clay, silt, sand and gravel) are classified as Secondary (undifferentiated) [95].

9.4.71 The Crag Group (sand and gravel) is designated by the EA as a Principal aquifer [96].

9.4.72 The proposed LSO study area is located within the WFD Broadland Rivers Chalk and Crag groundwater body (GB40501G400300). The WFD groundwater body is classified as having a 'poor' overall status [97]. RNAG are outlined in paragraph 9.4.27.

9.4.73 Much of the proposed LSO study area is classified as of medium - high groundwater vulnerability [98]. Within the LSO study area, areas underlain by extensive Happisburgh Glacigenic Formation (Diamicton), Lowestoft Formation (Diamicton), Breydon Formation, and Lacustrine deposits show reduced groundwater vulnerability, falling into the medium or low categories [99]. Medium groundwater vulnerability areas offer some groundwater protection. There are no SgZs within the proposed LSO study area.

9.4.74 The EA's GWDTE dataset [100] indicates that there are no SSSIs classified as GWDTEs within the LSO study area. However, it is possible that the two LNRs (discussed in paragraph 9.4.54) could be GWDTEs, or wetland habitats with a national non-statutory designation, or no designation, may

be present which could also constitute GWDTE classification. These will be identified through the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.

- 9.4.75 According to the EA's SPZ map, no SPZs intersect the proposed LSO EIA Scoping Area. However, a mapped SPZ lies within the LSO study area [101]. A Zone 3 (Total Catchment) SPZ is located approximately 600m west of the proposed LSO section of the EIA Scoping Area [102]. These SPZs represent areas around groundwater abstractions used for public/private supply, designated by the EA to protect water quality from contamination [103]. The terrestrial area of the proposed LSO section of the EIA Scoping Area lies within an NVZ [104].
- 9.4.76 There are two consented discharges to ground (PRELF1865 and PR4LF1115), with the details of these outlined in Table 9-4.
- 9.4.77 There is one licenced groundwater abstraction within the LSO study area [105] (Table 9-4). There may also be PWSs operating within the LSO study area. This information will be requested from the relevant Local Authority as part of the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.

Table 9-4: Licenced Groundwater Abstractions within the Proposed LSO Study Area

| Licence Number  | NGR                  | Maximum Annual Quantity (m <sup>3</sup> ) | Maximum Daily Quantity (m <sup>3</sup> ) | Purpose                 |
|-----------------|----------------------|-------------------------------------------|------------------------------------------|-------------------------|
| 7/34/19/*G/0094 | TM<br>51400<br>99600 | 15,900                                    | 109                                      | Spray irrigation-direct |

## Flood Risk

### Fluvial

- 9.4.78 The FMfP [106] indicates that there are areas of Flood Zone 3 and Flood Zone 2 in the LSO EIA Scoping Area and study area. The Flood Zones interact with the LSO study area along the coastline to the east (associated

with the North Sea) and in the central area where the proposed LSO section of the EIA Scoping Area crosses the A47 carriageway (associated with the unnamed tributary of the River Waveney).

- 9.4.79 Flood Zone 3b has been defined within the relevant Local Authority SFRA [107] [108]. A review of the respective SFRA mapping indicates that the LSO study area is within Flood Zone 3b, but the proposed LSO section of the EIA Scoping Area is not. Flood Zone 3b within the LSO study area is associated with the North Sea.
- 9.4.80 A review of Risk of flooding from rivers and sea plus climate change (RoFRS + CC) mapping [109] indicates that there would be an increased risk of flooding from the sea, associated with the North Sea, with an increase in areas of high risk, which correlates with Flood Zone 3.

#### *Surface Water*

- 9.4.81 RoFSW mapping [110] indicates that there are areas of high – low risk, across the proposed LSO section of the EIA Scoping Area and study area. There are generally small, isolated areas of ponding, particularly in high – medium risk events.
- 9.4.82 A review of RoFSW + CC mapping [111] indicates minor increases in the extent of areas of ponding, with larger areas now associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated.

#### *Groundwater*

- 9.4.83 The East Suffolk SFRA [112] uses the BGS Susceptibility to Groundwater Flooding dataset, which classifies most of the proposed LSO section of the EIA Scoping Area as having '*limited potential for groundwater flooding to occur*'. A small area of the proposed LSO section of the EIA Scoping Area south of Gunton Warren Park is classified as having '*potential for groundwater flooding of property situated below ground level and at the surface*'.

- 9.4.84 However, this dataset is only intended to provide an indication of where groundwater might emerge and does not show the likelihood of groundwater flooding occurring. Site-specific groundwater flood risk will be assessed in the water environment chapter of the ES during the next stage of the EIA process.

#### *Reservoir*

- 9.4.85 EA Reservoir Flood Risk mapping [113], [114] indicates that the proposed LSO section of the EIA Scoping Area and study area are located outside of risk extents for both dry and wet days. Therefore, no flood risk is anticipated from reservoirs.

#### **Other Sources**

##### *Tidal*

- 9.4.86 The nearest tidal influenced watercourse to the proposed LSO section of the EIA Scoping Area is Oulton Dyke, which is connected to the River Waveney. The tidal limit of the River Waveney is Ellingham Mill [115] which is upstream of the proposed LSO section of the EIA Scoping Area and study area. The proposed LSO section of the EIA Scoping Area and study area are located within mapped fluvial Flood Zones associated with the River Waveney. Therefore, there is a risk of flooding anticipated from this source.
- 9.4.87 A review of the relevant Local Authority SFRAs [116], [117] indicate that tidal storm surges have been recorded from as early as 1888. While the tidal flooding incidents documented within the East Suffolk SFRA do not provide specific locations and are described more generally along the East Suffolk coastline, they highlight a presence of a wider tidal flood risk in the area that may influence water levels within the River Waveney and its connected watercourses.

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### *Canal*

- 9.4.88 A review of canal mapping [118] indicates that there are no canals in the vicinity of the proposed LSO section of the EIA Scoping Area and study area. Therefore, no flood risk is anticipated from this source.

### *Historic*

- 9.4.89 The EA's Recorded Flood Outlines [119] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising records from as early as 1946. The mapping does not show any flooding incidents recorded within the proposed LSO section of the EIA Scoping Area and study area.
- 9.4.90 A review of the relevant Local Authority SFRAs [120], [121] indicates that there has been flooding recorded within the Great Yarmouth Borough and East Suffolk district. The most common recorded flood source is tidal flooding from storm surges, but previous flood incidents also include tidal, fluvial, surface water and sewer, as well as combined sources (tidal and fluvial, surface water and fluvial).

## **Proposed CSR**

### **Statutory Designations**

- 9.4.91 There are no international sites or nationally designated sites within the study area associated with the proposed CSR section of the EIA Scoping Area.
- 9.4.92 GWDTEs will be discussed in the groundwater section below.

### **Surface Water Receptors**

- 9.4.93 There are no SMRs present within the proposed CSR study area [122]. The surface water receptors within the proposed CSR study area predominantly comprises agricultural field drains and small unnamed watercourses [123].
- 9.4.94 Numerous small, unnamed ponds are present within the proposed CSR study area. These features are typically surrounded by riparian mixed



broadleaved woodland, while the surrounding landscape is predominantly agricultural in character [124]. Packway Water is one of the larger artificial ponds located to the north of the proposed CSR section of the EIA Scoping Area, which appears to be used recreationally [125]. This pond appears to be artificially modified as LiDAR data show large embankments containing the water [126]. This pond appears to feed one of the tributaries of the River Blyth.

- 9.4.95 The proposed CSR section of the EIA Scoping Area and its study area falls within two WFD catchments, comprising the Minsmere Old River Water Body (GB105035046270) and the Wenhanston Watercourse Water Body (GB105035046010) [127].

#### *Surface Water Supply*

- 9.4.96 According to the EA Water Abstraction Licenses Mapping, there are no surface water abstraction points within the proposed CSR study area [128].
- 9.4.97 The information on surface water abstractions was obtained from publicly available data sources. As outlined in paragraph 9.4.3, additional data on surface water abstractions, discharges and PWSs will be requested to inform the assessment in the water environment chapter of the ES.

#### *Hydromorphology*

- 9.4.98 Comparison with historical mapping from 1884 indicates minimal changes to watercourses within the proposed CSR study area, with numerous small, unnamed ponds and field drains already established at that time. Packway Water is absent from historical mapping dating back to 1885, suggesting that this feature is a relatively recent artificial addition. The alignments of tributaries to the River Blyth appears to have remained largely unchanged, particularly in relation to agricultural field drainage patterns. A similar degree of stability is observed within the tributaries of the River Yox.
- 9.4.99 Several minor roads intersect the proposed CSR study area, with watercourses culverted beneath them at various locations. These channels

generally exhibit limited natural geomorphological features, as they largely comprise straightened agricultural field drains [129].

9.4.100 A small unnamed tributary of the River Blyth originates from a series of headwaters approximately 200m northwest of the proposed CSR section of the EIA Scoping Area. This unnamed tributary flows predominantly through agricultural field drains and, in its downstream reaches, runs parallel to Peasehall Road. It displays a relatively straight planform before joining the River Blyth south of Walpole.

9.4.101 To the south of the proposed CSR section of the EIA Scoping Area, several unnamed tributaries ultimately discharge into the River Yox. Similar to those feeding the River Blyth, these channels appear to follow agricultural field drainage networks prior to joining the main river [130]. This indicates that these channels may have been historically modified or created to improve drainage of arable land.

#### *Surface Water Quality*

9.4.102 There are no EA water quality data available within the proposed CSR study area.

9.4.103 There are two consented discharge sites present within the proposed CSR study area, both of which relate to domestic sewage discharges [131]. These are shown in Table 9-5.

Table 9-5: Environment Agency Consented Discharge Site within the Proposed CSR Study Area

| Name of Site                      | Permit Number | NGR          | Receiving Water Body            | Type of Outlet |
|-----------------------------------|---------------|--------------|---------------------------------|----------------|
| Rose Cottage & Apple Tree Cottage | PR4NF1948     | TM3770071600 | Trib Minsmere River             | Sewage         |
| Mill House                        | PR4NF840X     | TM3740071800 | Into land / infiltration system | Sewage         |

- 9.4.104 The WFD Minsmere Old River Water Body (GB105035046270) catchment is classed as having ‘moderate’ ecological status (as part of WFD Cycle 3 Classification). The RNAG were attributed to physical modification causing ecological discontinuity and land drainage impacting fish populations.
- 9.4.105 The WFD Wenhanston Watercourse Water Body (GB105035046010) is also classified as having ‘moderate’ ecological status, with RNAG being identified as pollution from agricultural land and water industry assets impacting populations of invertebrates and causing increased nutrients [132].

### Groundwater

- 9.4.106 BGS mapping [133] indicates that the superficial deposits underlying parts of the proposed CSR section of the EIA Scoping Area comprises Lowestoft Formation (Diamicton). A small stretch of Head (clay, silt, sand and gravel) is also exposed within the southeast of the proposed CSR study area, close to the River Yox.
- 9.4.107 The bedrock geology underlying areas of the proposed CSR study area comprises the Crag Group (sand and gravel) [134].
- 9.4.108 The superficial deposits beneath areas of the proposed CSR study area are classified by the EA as a Secondary (undifferentiated) aquifer [135].
- 9.4.109 The Crag Group (Sand and gravel) is designated by the EA as a Principal aquifer [136].
- 9.4.110 The proposed CSR study area sits within the WFD Waveney and East Suffolk Chalk and Crag groundwater body (GB40501G400600). This WFD groundwater body is classified as having a ‘poor’ overall status. The RNAGs all relate to agricultural diffuse pollution, specifically poor livestock management, affecting the Trend Assessment, General Chemical Test, and Chemical Drinking Water Protected Area [137].

- 9.4.111 The proposed CSR study area is located in an area classified as having medium groundwater vulnerability [138]. There are no SgZs (groundwater) within the proposed CSR study area.
- 9.4.112 There are no nature conservation sites (as outlined in paragraph 9.4.91) with a statutory designation within the proposed CSR study area. This aligns with the EA's GWDTE dataset [139] which confirms that there are no SSSIs classified as GWDTE in the proposed CSR study area. However, it is possible that wetland habitats with a national non-statutory designation, or no designation, are present and which could constitute GWDTE classification. These will be identified through the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.
- 9.4.113 According to the EA's SPZ map, the proposed CSR EIA Scoping Area is situated within a Zone 3 (Total Catchment). A Zone 2 (Outer Protection Zone) is located approximately 2.9km north of this section of the EIA Scoping Area. A Zone 1 (Inner Protection Zone) is located approximately 3.1km north of the proposed CSR section of the EIA Scoping Area [140]. The proposed CSR section of the EIA Scoping Area is located within an NVZ [141].
- 9.4.114 There is one consented discharge that discharges to ground within the proposed CSR study area, this is discussed in paragraph 9.4.103.
- 9.4.115 There are no licenced groundwater abstractions within the proposed CSR study area.

### **Flood Risk**

#### *Fluvial*

- 9.4.116 The FMfP [142] indicates that there are no areas of Flood Zone 3 and Flood Zone 2 in the proposed CSR section of the EIA Scoping Area and study area.

9.4.117 A review of the relevant Local Authority SFRAs [143], [144] indicates that the proposed CSR section of the EIA Scoping Area and study area are not located within Flood Zone 3b.

9.4.118 A review of RoFRS + CC mapping [145] indicates that there would be no significant areas of additional fluvial flood risk within the proposed CSR section of the EIA Scoping Area and study area.

#### *Surface Water*

9.4.119 RoFSW mapping [146] indicates that there are areas of high – low risk in the proposed CSR section of the EIA Scoping Area and study area. Within the study area, there are areas of ponding associated with high – low risk, as well as overland flow paths, and flow paths that indicate the presence of additional ordinary watercourses and their tributaries.

9.4.120 Within the proposed CSR section of the EIA Scoping Area, the surface water flood risk is largely located in isolated areas of ponding associated with high – low risk. However, in the south of the proposed CSR section of the EIA Scoping Area, there are two overland flow paths. The flow path at the southern boundary is largely associated with medium and low risk and drains into the additional flow path at the southern boundary, which is associated with high, medium and low risk extents. The larger flow path flows in a southeasterly direction through the proposed CSR study area, and approximately 150m south of the proposed CSR section of the EIA Scoping Area, the flow paths meet and continue to flow in a southeasterly direction. A review of aerial mapping indicates that downstream of where the two flow paths meet, it continues to flow around the borders of arable land and is more likely to represent drainage ditches. Additional overland flow paths in the proposed CSR study area drain into these ditches.

9.4.121 A review of RoFSW + CC mapping [147] indicates that areas of ponding will have minor increases in extent, with larger areas now associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated as a result of climate change.

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### Groundwater

9.4.122 The East Suffolk SFRA [148] uses the BGS Susceptibility to Groundwater Flooding dataset, which classifies the proposed CSR section of the EIA Scoping Area and study area as having *'limited potential for groundwater flooding to occur'*.

9.4.123 However, this dataset is only intended to provide an indicative picture of where groundwater might emerge and does not show the likelihood of groundwater flooding occurring. Site-specific groundwater flood risk will be assessed during the next stage of the EIA process to inform the assessment in the water environment chapter of the ES.

### Reservoir

9.4.124 EA Reservoir Flood Risk mapping [149], [150] indicates that the proposed CSR section of the EIA Scoping Area and study area are located outside of risk extents for both dry and wet days. Therefore, no flood risk is anticipated from reservoirs.

### Other Sources

#### Tidal

9.4.125 The nearest tidal influenced watercourse to the proposed CSR section of the EIA Scoping Area is the River Blythe. The tidal limit for the watercourse is defined as at Blyford Bridge [151], which is downstream of the reach of the River Blyth nearest the proposed CSR section of the EIA Scoping Area and study area. Therefore, no flood risk is anticipated from this source.

#### Canal

9.4.126 A review of canal mapping [152] indicates that there are no canals in the vicinity of the proposed CSR section of the EIA Scoping Area and study area. Therefore, no flood risk is anticipated from this source.

#### Historic

9.4.127 The EA's Recorded Flood Outlines [153] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising

records from as early as 1946. The mapping does not show any flooding incidents recorded within the proposed section of the CSR EIA Scoping Area and study area.

- 9.4.128 A review of the East Suffolk SFRA [154] indicates that there was extensive flooding recorded within the Blyth Valley during 1981. However, the SFRA does not provide more specific locations of the historic flooding.

## Proposed WSR

### Statutory Designations

- 9.4.129 There are no international sites within the proposed WSR study area. There is, however, one nationally designated site (Gypsy Camp Meadows – Thrandeston SSSI) within the proposed WSR study area. The meadows represent one of the few remaining wet meadow sites in Suffolk and consists of a large and a smaller species rich wet meadow, situated on poorly drained Suffolk boulder-clay [155].
- 9.4.130 GWDTEs will be discussed in the groundwater section below.

### Surface Water Receptors

- 9.4.131 There are no SMRs within the proposed WSR study area [156]. According to OS mapping, the principal surface water receptors comprise ordinary watercourses, including small unnamed field drains and tributaries of the River Dove and the River Waveney. In addition, several small ponds are present within the area. However, these have not been quantified at this scoping stage [157] and instead will be assessed as part of the water environment chapter of the ES.
- 9.4.132 A small unnamed watercourse flows through the proposed WSR section of the EIA Scoping Area. This tributary originates near a farm on Leys Lane, before flowing northeast through agricultural field drains and eventually joining another larger unnamed tributary to the northwest of Old Bury Road [158]. This watercourse ultimately discharges to the River Waveney.

Additionally, a small unnamed tributary of the River Dove is present within the proposed WSR study area.

- 9.4.133 The proposed WSR section of the EIA Scoping Area falls within the WFD Tributary of Upper Waveney Water Body (GB105034045750), the WFD Dove Water Body (GB105034045710) and the WFD Waveney (Frenze Beck to Dove) Water Body (GB105034045780) catchments [159].

#### *Surface Water Supply*

- 9.4.134 According to the EA Water Abstraction Licenses Mapping, there are no surface water abstraction points within the proposed WSR study area [160].
- 9.4.135 The information on surface water abstractions was obtained from publicly available data sources. As outlined in paragraph 9.4.3, additional data on surface water abstractions, discharges and PWSs will be requested to inform the assessment in the water environment chapter of the ES.

#### *Hydromorphology*

- 9.4.136 The small unnamed tributary of the River Waveney that flows through the proposed WSR study area appears largely unchanged when compared with historic mapping from 1885, maintaining a similar alignment through agricultural field drains [161]. The channel exhibits a modified, non-natural planform, with limited geomorphological features. LiDAR data indicate that the watercourse is culverted at several locations, with the most substantial sections occurring beneath the railway line and a road. The data also show that the channel has been artificially straightened along field drains [162], which is likely to have affected its natural geomorphological function in these areas. Riparian woodland is present intermittently along the watercourse, with denser coverage observed downstream of the railway line [163] and the surrounding land use is predominantly arable.
- 9.4.137 Several small ponds are present within the proposed WSR study area, most of which appear to be located within private property land. LiDAR data indicates that many of these ponds have been artificially modified, with features such as embankments and artificial bank structures [164]. To the



east of Brome, larger ponds are situated around Parke's Farm and Brome Church, St Marys.

- 9.4.138 Within the proposed WSR study area, an unnamed tributary of the River Dove originates near Chestnuts Farm in an urban setting and flows eastwards in a predominantly straight channel before discharging into the River Dove. The watercourse appears to be modified, displaying a straight planform around agricultural fields throughout its course [165]. In places, the channel may have been realigned, potentially to move it to the edge of arable fields, where it shows a sharp right turn in a few places [166]. Such modifications are likely to have affected the natural geomorphology of the watercourse, resulting in a scarcity of natural features. While some riparian tree cover is present, the channel is generally closely bordered by arable farmland along much of its length [167].

#### *Surface Water Quality*

- 9.4.139 The physico-chemical data for the three WFD catchments within the proposed WSR study area is shown in Table 9-6. This includes:
- Tributary of Upper Waveney (GB105034045750).
  - Dove (GB105034045710).
  - Waveney (Frenze Beck to Dove) (GB105034045780).
- 9.4.140 The Tributary of Upper Waveney WFD Water Body and the Dove WFD Water Body are classified as having a 'moderate' ecological status (under WFD Cycle 3 Classification). RNAG is attributed to point and diffuse pollution from sewage discharges and agricultural practices including poor nutrient and livestock management. In addition, the Dove WFD Water Body is also pressured from physical modifications from land drainage and other barriers causing ecological discontinuity across the catchment [168].
- 9.4.141 The Waveney (Frenze Beck to Dove) WFD Water Body is currently classified as having 'bad' ecological status, meaning the watercourse has been significantly altered from natural conditions. RNAG for this water body are due to pollution from sewage and agricultural run-off which impacts

phosphate levels, dissolved oxygen levels and fish populations. In addition, drought and flow pressures from the water industry which can lead to impacts on the hydrological regime and dissolved oxygen levels in the water body. Physical modifications, such as flood protections, are also noted as being a pressure for this water body, creating barriers to ecological continuity and impacting fish and dissolved oxygen levels [169].

Table 9-6: The Physico-chemical Quality Data for the WFD Dove Water Body, Tributary of Upper Waveney and Waveney (Frenze Beck to Dove) Water Body (Cycle 3 Classification) [170].

|                                                  | Dove Water Body |          | Tributary of Upper Waveney |          | Waveney (Frenze Beck to Dove) Water Body |          |
|--------------------------------------------------|-----------------|----------|----------------------------|----------|------------------------------------------|----------|
|                                                  | 2019            | 2022     | 2019                       | 2022     | 2019                                     | 2022     |
| <b>Overall Physico-chemical quality elements</b> | Moderate        | Moderate | Moderate                   | Moderate | Bad                                      | Bad      |
| <b>Ammonia (Phys-Chem)</b>                       | High            | Poor     | High                       | High     | High                                     | High     |
| <b>Dissolved Oxygen</b>                          | Poor            | Good     | High                       | High     | Bad                                      | Bad      |
| <b>Phosphate</b>                                 | Poor            | Moderate | Moderate                   | Moderate | Moderate                                 | Moderate |
| <b>Temperature</b>                               | High            | High     | High                       | High     | Good                                     | High     |
| <b>pH</b>                                        | High            | High     | High                       | High     | High                                     | High     |

9.4.142 There are multiple consented discharge points within the proposed WSR study area, most of which discharge into freshwater systems. These discharges have the potential to affect local water quality, particularly through increased nutrient inputs. These are outlined in Table 9-7.

Table 9-7: The Consented Discharge Sites within the Proposed WSR Study Area [171].

| Name of Site                  | Permit Number | NGR          | Receiving Water Body       | Type of Outlet |
|-------------------------------|---------------|--------------|----------------------------|----------------|
| Thrandeston Church Hall       | PR4NF1122     | TM1150076400 | Tributary of River Waveney | Sewage         |
| Friday Cottage Street         | EPRMB3490DT   | TM1129776450 | Tributary of River Waveney | Sewage         |
| Stuston STW AW                | ASENF87       | TM1287076950 | Tributary of River Waveney | Sewage         |
| Eye                           | EPRMB3956TR   | TM1191474987 | Tributary of River Waveney | Trade          |
| Eye Industrial Estate         | PRENF02205    | TM1337075730 | Tributary of River Dove    | Miscellaneous  |
| Roy Humphrey Group            | PRENF11576    | TM1319075540 | Tributary of River Dove    | Sewage         |
| Roy Humphrey Group            | PRENF11577    | TM1305075530 | Tributary of River Waveney | Sewage         |
| Roy Humphrey Group            | PRENF11706    | TM1313075440 | Thrandeston Watercourse    | Sewage         |
| Industrial Units              | PR4NF207      | TM1353475905 | Tributary of River Dove    | Sewage         |
| Oak Lodge Park                | EPRVB3698WT   | TM1409475701 | Tributary of River Dove    | Sewage         |
| Brome Agricultural Industries | PR4NF332X     | TM1365075390 | Tributary of River Dove    | Sewage         |

### Groundwater

9.4.143 BGS mapping [172] indicates that the superficial deposits underlying the majority of the proposed WSR section of the EIA Scoping Area comprise the Lowestoft Formation (Diamicton). The proposed WSR study area also contains small exposures of:

- Lowestoft Formation (sand and gravel).

- Head (clay, silt, sand and gravel).
- Croxton Sand and Gravel Member (sand and gravel).
- Alluvium (clay, silt, sand and gravel).
- Peat (peat).
- Lodge Farm Silt and Clay Member (clay, silt and sand).

- 9.4.144 The bedrock geology underlying the majority of the proposed WSR study area comprises the Norwich Crag Formation (sand). The north-western parts of the proposed WSR study area are underlain by the Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations (undifferentiated) (chalk) [173].
- 9.4.145 The majority of the superficial deposits beneath the proposed WSR study area are classified by the EA as Secondary (undifferentiated) aquifers, while areas underlain by Alluvium (clay, silt, sand and gravel) and Lowestoft Formation (sand and gravel) are designated as Secondary A aquifers [174].
- 9.4.146 The Crag Group (sand and gravel) and the Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations are designated by the EA as Principal aquifers [175].
- 9.4.147 The proposed WSR study area is located within the WFD Broadland Rivers Chalk and Crag groundwater body (GB40501G400300). The WFD groundwater body is classified as having a 'poor' overall status [176]. RNAG are outlined in paragraph 9.4.27.
- 9.4.148 The proposed WSR study area is located within medium or medium - high groundwater vulnerability zones, with small areas, largely corresponding to peat exposures, classified as having low groundwater vulnerability [177]. There are no SgZs (groundwater) within the proposed WSR study area.
- 9.4.149 There are no nature conservation sites (as outlined in paragraph 9.4.129) with a statutory national or international designation within the proposed WSR study area.

- 9.4.150 The EA's GWDTE dataset [178] indicates that there is one SSSI, Gypsy Camp Meadows – Thrandeston, classified as a GWDTE located within the proposed WSR study area. It is possible wetland habitats with a national non-statutory designation, or no designation, are present and which could constitute GWDTE classification. These will be identified through the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.
- 9.4.151 According to the EA's SPZ map, the proposed WSR EIA Scoping Area is not located within a SPZ. The south-eastern parts of the proposed WSR study area intersect this Zone 3 SPZ. The proposed WSR section of the EIA Scoping Area is located within an NVZ [179].
- 9.4.152 There are no consented discharges to ground within the proposed WSR study area.
- 9.4.153 There are two licenced groundwater abstractions within the proposed WSR study area [180]. The details are outlined in Table 9-8. There may also be PWSs operating within the study area. This information will be requested from the relevant Local Authority as part of the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.

Table 9-8: Licenced Groundwater Abstractions within the Proposed WSR Study Area.

| Licence Number  | NGR            | Maximum Annual Quantity (m <sup>3</sup> ) | Maximum Daily Quantity (m <sup>3</sup> ) | Purpose           |
|-----------------|----------------|-------------------------------------------|------------------------------------------|-------------------|
| AN/034/0017/009 | TM 13904 75450 | 68,195                                    | 460                                      | Vegetable washing |
| AN/034/0017/008 | TM 13914 75429 | 15,395                                    | 218                                      | Vegetable washing |

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## Flood Risk

### *Fluvial*

- 9.4.154 The FMfP [181] indicates that there are small areas of Flood Zone 3 and Flood Zone 2 in the proposed WSR study area. The Flood Zones within the WSR study area are associated with the unnamed tributary of the River Waveney and its tributary in the northwest of the proposed WSR study area.
- 9.4.155 Within the Mid Suffolk SFRA [182], Flood Zone 3b is defined as land that would flood during a 5% (1 in 20) AEP event. Where modelling for a 5% (1 in 20) AEP event was not available, Flood Zone 3 was used. The SFRA indicates that the study area is located within Flood Zone 3b. However, it correlates to Flood Zone 3 rather than an area modelled to flood within a 5% AEP event. The area of Flood Zone 3b within the proposed WSR study area is associated with an unnamed tributary of the River Waveney.
- 9.4.156 A review of RoFRS + CC mapping [183] indicates that there is no noticeable increase in the spatial extent of fluvial flood risk within the proposed WSR section of the EIA Scoping Area and study area. The mapping shows very limited areas of additional medium and high risk, confined within the existing Flood Zone 3 extent. As such, any changes in fluvial flood risk are anticipated to be minimal in scale and do not significantly alter the overall fluvial flood risk baseline within the proposed WSR study area.

### *Surface Water*

- 9.4.157 RoFSW mapping [184] indicates that there are areas of high – low risk within the proposed WSR section of the EIA Scoping Area and study area. The main risk is associated with a large overland flow pathway flowing through the centre of the proposed WSR section of the EIA Scoping Area and study area. The flow path flows from the southwest of the proposed WSR study area in a northeasterly direction, and then in a north-westerly direction. The flow path more likely indicates the presence of an ordinary watercourse which was not included within OS Open River mapping [185].

The mapping indicates that the flow path drains into the River Waveney's unnamed tributaries.

- 9.4.158 There are small, isolated areas of ponding within the proposed WSR section of the EIA Scoping Area, associated with high-low risk. In the northwest of the study area, there is a significant area of surface water ponding associated with high – low risk. The ponding is likely due to the low-lying land either side of a railway embankment. Part of this risk extent is represented within the Flood Zone mapping, and therefore it may also represent fluvial flood risk as well as surface water.
- 9.4.159 A review of RoFSW + CC mapping [186] indicates that areas of ponding will have larger areas associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated.

#### *Groundwater*

- 9.4.160 The Mid Suffolk SFRA [187] includes a 1% (1 in 100) AEP Groundwater Flood Map, which shows that the proposed WSR section of the EIA Scoping Area and most of the associated study area are classified as 'negligible risk'. The northwest of the proposed WSR study area is shown to have areas with groundwater levels between 0.5m and 5m, and 25mm and 0.5m below the ground surface, and within 25mm of the ground surface, around Thrandeston Marsh, respectively.
- 9.4.161 However, this dataset is only intended to provide a broad scale picture of groundwater flood hazard. Site specific groundwater flood risk will be assessed during the next stage of the EIA process to inform the assessment in the water environment chapter of the ES.

#### *Reservoir*

- 9.4.162 Environment Agency Reservoir Flood Risk mapping [188], [189] indicates that the proposed WSR study area is located outside of risk extents for both dry and wet days. Therefore, no flood risk is anticipated from reservoirs.

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## Other Sources

### *Tidal*

- 9.4.163 The nearest tidal influenced watercourse to the proposed WSR section of the EIA Scoping Area is the River Waveney. The tidal limit for the watercourse is defined as at Ellingham Mill [190] which is downstream of the reach of the River Waveney nearest the proposed WSR section of the EIA Scoping Area and study area. Therefore, no flood risk is anticipated from this source.

### *Canal*

- 9.4.164 A review of canal mapping [191] indicates that there are no canals in the vicinity of the proposed WSR study area. Therefore, no flood risk is anticipated from this source.

### *Historic*

- 9.4.165 The EA's Recorded Flood Outlines [192] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising records from as early as 1946. The mapping does not show any flooding incidents recorded within the proposed WSR study area.
- 9.4.166 A review of the Mid Suffolk SFRA [193] indicates that there has been one historic report of sewer flooding in the area of Diss, a town approximately 2km north of the proposed WSR study area's northernmost boundary. No further historic flood events in proximity to the proposed WSR section of the EIA Scoping Area and study area have been documented.

## Proposed AWRP to River Waveney Pipeline

### Statutory Designations

- 9.4.167 There is one designated site within the proposed AWRP to River Waveney Pipeline study area which is Leet Hill and Kirby Cane SSSI. This site is designated due to the presence of geological features, such as glacial deposits [194].



- 9.4.168 A number of designated sites lie outside the proposed AWRP to River Waveney Pipeline study area but are located within the floodplains of the River Waveney. As these sites are situated downstream of the proposed outlet discharge point, they may have hydrological connection to the proposed AWRP to River Waveney Pipeline.
- 9.4.169 These sites are the Broadland SPA and Broadland Ramsar international sites, in addition to The Broads SAC.
- 9.4.170 The Broadland (Ramsar), Geldeston Meadows SSSI and a section of The Broads SAC are located on the floodplains of the River Waveney, between the outfall of the proposed AWRP to River Waveney Pipeline and the existing abstraction site for the proposed Barsham WTW to CSR Pipeline [195].
- 9.4.171 The Broads SAC is designated for containing several examples of naturally nutrient-rich lakes. These lakes, along with the ditches within areas of fen and drained marshlands, support relict vegetation of the original Fenland flora. The Broadlands SPA, designated under the Birds Directive [196], supports internationally important breeding marshland birds and significant assemblages of overwintering waterfowl [197].
- 9.4.172 Geldeston Meadows SSSI lies within the floodplain of the River Waveney and forms an exceptionally diverse, traditionally managed grazing meadow. A high-water table is maintained throughout the year, with light summer grazing by cattle. Gradients in the water table and variations in soil type which range from peats to clays have created conditions for the development of multiple plant communities and a diverse flora [198].
- 9.4.173 GWDTes will be discussed in the groundwater section below.

### Surface Water Receptors

- 9.4.174 There are two SMRs which fall within the proposed AWRP to River Waveney Pipeline study area, comprising the River Waveney and the upper

headwaters of The Fleet. The River Waveney interacts with the proposed AWRP to River Waveney Pipeline study area in two locations.

- 9.4.175 Due to the low-lying nature of the area, there are a significant number of drains and ponds within the floodplain of the River Waveney [199]. These have not been quantified at this scoping stage and instead will be assessed in the water environment chapter of the ES.
- 9.4.176 This area is covered by two WFD water bodies, namely the Waveney (Ellingham Mill – Burgh St. Peter) River Water Body (GB105034045903) and Bure & Waveney & Yare & Lothing Transitional Water Body (GB5103410700) [200].

#### *Surface Water Supply*

- 9.4.177 There is one existing EA surface water licensed abstraction point located within the proposed AWRP to River Waveney Pipeline study area [201]. This site is summarised in Table 9-9.

Table 9-9: EA Consented Abstraction Points Located within the Proposed AWRP to River Waveney Pipeline Study Area [202].

| License Holder   | License Number  | Purpose          | Source Type                    | NGR               |
|------------------|-----------------|------------------|--------------------------------|-------------------|
| Lord Somerleyton | 7/34/19/*S/0086 | Spray Irrigation | Surface Water<br>River Waveney | TM 50105<br>95724 |

#### *Hydromorphology*

- 9.4.178 The River Waveney is a lowland, slow flowing river which rises from chalk aquifers in the wetlands of Redgrave and Lopham Fen [203]. From Hoxne, the bedrock changes to sand as it flows southeast, eventually forming part of the Southern Broads before discharging into the North Sea. This watercourse has undergone extensive historical modifications, mainly to support navigational and agricultural reasons. Past dredging activities have reduced its morphological diversity and are likely to have resulted in over-

deepened sections [204]. Due to the low-lying nature of the land, it has a wide floodplain that contains numerous drainage channels and ponds [205].

9.4.179 The upper headwaters of The Fleet are located within the proposed AWRP to River Waveney Pipeline study area. This watercourse has been described in paragraph 9.4.60.

9.4.180 Additionally, the North Sea is located within the proposed AWRP to River Waveney Pipeline study area. This water body has also been described previously in paragraph 9.4.63.

#### *Surface Water Quality*

9.4.181 The physico-chemical data for the two WFD catchments within the proposed AWRP to River Waveney Pipeline study area are shown in Table 9-10. This includes:

- Waveney (Ellingham Mill – Burgh St. Peter) Water Body (GB105034045903).
- Bure & Waveney & Yare & Lothing Water Body (GB5103410700).

9.4.182 Both WFD Water Bodies are classified as having a ‘moderate’ ecological status (under WFD Cycle 3 Classification). RNAG for the Waveney (Ellingham Mill – Burgh St. Peter) WFD Water Body is due to physical modifications from flood protection and recreation [206]. The main RNAG for the Bure & Waveney & Yare & Lothing WFD Water Body is attributed to point source pollution from sewage discharge causing increases in dissolved inorganic nitrogen [207].

Table 9-10: Overview of the Water Quality Data for each WFD Catchment within the Proposed AWRP to River Waveney Pipeline Study Area.

|                                           | Waveney (Ellingham Mill – Burgh St. Peter) Water Body [208] |          | Bure & Waveney & Yare & Lothing Water Body |          |
|-------------------------------------------|-------------------------------------------------------------|----------|--------------------------------------------|----------|
|                                           | 2019                                                        | 2022     | 2019                                       | 2022     |
| Overall Physico-chemical quality elements | Moderate                                                    | Moderate | Moderate                                   | Moderate |
| Acid Neutralising Capacity                | N/A                                                         | High     | N/A                                        | N/A      |
| Ammonia (Phys-Chem)                       | High                                                        | High     | N/A                                        | N/A      |
| Biochemical Oxygen Demand                 | N/A                                                         | High     | N/A                                        | N/A      |
| Dissolved Oxygen                          | Moderate                                                    | Moderate | High                                       | High     |
| Phosphate                                 | Moderate                                                    | Good     | N/A                                        | N/A      |
| Temperature                               | Moderate                                                    | Good     | N/A                                        | N/A      |
| pH                                        | High                                                        | High     | N/A                                        | N/A      |

9.4.183 There are several consented discharge points within the proposed AWRP to River Waveney Pipeline study area, as shown in Table 9-11. These can have a significant impact on the water quality within each receiving water body, such as causing an increase in nutrient levels.

Table 9-11: Details of the Consented Discharge Points within the Proposed AWRP to River Waveney Pipeline Study Area [209].

| Name of Site          | Permit Number | NGR          | Receiving Water Body       | Type of Outlet |
|-----------------------|---------------|--------------|----------------------------|----------------|
| Conway                | EPRTB3357TV   | TM5269097388 | Tributary of River Waveney | Sewage         |
| White House Farm      | EPRCP3825XH   | TM5264597605 | Gull Stream                | Sewage         |
| Wynwood, Staithe Road | PRENF08900    | TM4675093500 | Tributary of River Waveney | Sewage         |

| Name of Site                        | Permit Number | NGR          | Receiving Water Body         | Type of Outlet |
|-------------------------------------|---------------|--------------|------------------------------|----------------|
| High View, Staithe Road             | PR4NF1681     | TM4670093700 | Tributary of River Yox       | Sewage         |
| Sunny Holme                         | EPRZP3724GC   | TM4666493664 | Tributary of River Waveney   | Sewage         |
| Wheatacre Water Recycling Plant AW  | PRENF15022    | TM4618094050 | Tributary of River Waveney   | Sewage         |
| Corbetts                            | EPRFB3157TJ   | TM4290293400 | Tributary of Carpenters Dyke | Sewage         |
| Toft Monks Swaley Close AW          | PRENF15015    | TM4257094540 | Tributary of River Waveney   | Sewage         |
| Hill Farm                           | PRENF2444     | TM4255094500 | Tributary of River Waveney   | Sewage         |
| Kirby Cane Water Treatment Works AW | EPREB3094NF   | TM3763592581 | The Main Run Drain           | Trade          |
| Ellingham STW AW                    | AW4NF503      | TM3732491595 | River Waveney                | Sewage         |

### Groundwater

9.4.184 BGS mapping [210] indicates the proposed AWRP to River Waveney Pipeline study area overlies multiple superficial deposits including:

- Happisburgh Glacigenic Formation (sand).
- Corton Woods Sand and Gravel Member (sand and gravel).
- Lacustrine deposits (clay and silt).
- Alluvium (clay, silt, sand and gravel).
- Breydon Formation (peat).
- Lowestoft Formation (Diamicton).
- Head (clay, silt, sand and gravel).
- Lowestoft Formation (sand and gravel).

- Happisburgh Glacigenic Formation (Diamicton).
- Crag Group and Bytham Sand and Gravel Formation (Undifferentiated) (sand and gravel).
- Lowestoft Formation (clay and silt).
- Haddiscoe Sand and Gravel Member (sand and gravel).
- Aldeby Sand and Gravel Member (sand and gravel).
- River Terrace Deposits (1- sand and gravel).
- River Terrace Deposits (2- sand and gravel).
- Breydon Formation (clay and silt).

9.4.185 The bedrock geology underlying the entire proposed AWRP to River Waveney Pipeline study area comprises the Crag Group (Sand and gravel) [211].

9.4.186 The majority of the superficial deposits beneath the proposed AWRP to River Waveney Pipeline study area are classified by the EA as Secondary A and Secondary (undifferentiated) aquifers [212]. The Breydon Formation (peat) are classified as an Unproductive aquifer [213]. Unproductive strata are largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them [214].

9.4.187 The Crag Group (Sand and gravel) is designated by the EA as a Principal aquifer [215].

9.4.188 The proposed AWRP to River Waveney Pipeline study area is located within the WFD Broadland Rivers Chalk and Crag groundwater body (GB40501G400300). The WFD groundwater body is classified as having a 'poor' overall status [216]. RNAG are outlined in paragraph 9.4.27.

9.4.189 The majority of the proposed AWRP to River Waveney Pipeline study area is classified as of medium -high or medium groundwater vulnerability [217]. The Breydon Formation (peat) is classified as low vulnerability, reflecting its non-aquifer characteristics and very low permeability, which together limit groundwater flow and pollutant migration. There are no SgZs (groundwater) within the proposed AWRP to River Waveney Pipeline study area.

- 9.4.190 The EA's GWDTE dataset [218] indicates that there are two SSSIs classified as GDWTEs within the proposed AWRP to River Waveney Pipeline study area. These are Stanley and Alders Carrs, Aldeby and Geldeston Meadows. Both sites form part of The Broads SAC and The Broadlands SPA [219] and are discussed in paragraph 9.4.171. There may also be wetland habitats with a national non-statutory designation, or no designation present which could constitute GWDTE classification. These will be identified during the next stages of the EIA process to inform the assessment in the water environment chapter of the ES.
- 9.4.191 According to the EA's SPZ map, a Zone 3 (Total Catchment) SPZ is located within the proposed AWRP to River Waveney Pipeline study area to the east, close to Corton. To the west of the proposed AWRP to River Waveney Pipeline EIA Scoping Area, west of Toft Monks, lies entirely within a Zone 3 (Total Catchment) SPZ. Two Zone 2 (Outer Protection Zone) and two Zone 1 areas fall within the proposed AWRP to River Waveney Pipeline study area, with the more northern Zone 2 also intersecting the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area [220]. The proposed AWRP to River Waveney Pipeline study area lies within an NVZ [221].
- 9.4.192 There are no consented discharges to ground within the proposed AWRP to River Waveney Pipeline study area.
- 9.4.193 There are five licenced groundwater abstractions within the proposed AWRP to River Waveney Pipeline study area [222] (as shown in Table 9-12). There may also be PWSs operating within the study area, this information will be requested from the relevant Local Authority as part of the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.

Table 9-12: Licenced Groundwater Abstractions within the Proposed AWRP to River Waveney Pipeline Study Area.

| Licence Number      | NGR                  | Maximum Annual Quantity (m <sup>3</sup> ) | Maximum Daily Quantity (m <sup>3</sup> ) | Purpose                      |
|---------------------|----------------------|-------------------------------------------|------------------------------------------|------------------------------|
| 7/34/19/*G/0094     | TM<br>51400<br>99600 | 15,900                                    | 109                                      | Spray irrigation-direct      |
| 7/34/19/*G/0153/R01 | TM<br>51025<br>97893 | 11,000                                    | 594                                      | Spray irrigation-direct      |
| 7/34/19/*G/0117     | TM<br>47300<br>94600 | 48,000                                    | 600                                      | Spray irrigation-direct      |
| AN/034/0019/001/R01 | TM<br>42602<br>95318 | 97,000                                    | 1,010                                    | General farming and domestic |
| 7/34/19/*G/0116     | TM<br>37140<br>92160 | 9,000                                     | 455                                      | Spray irrigation-direct      |

## Flood risk

### Fluvial

- 9.4.194 The FMfP [223] indicates that there are areas of Flood Zone 3 and Flood Zone 2 within the proposed AWRP to River Waveney Pipeline study area. The Flood Zones within the proposed AWRP to River Waveney pipeline study area are associated with the River Waveney and its tributaries. Flood Zone 3 largely interacts with the proposed AWRP to River Waveney Pipeline study area between Burgh St Peter and Somerleyton, where it follows the course of the River Waveney. Additionally, the Flood Zones interact with the western end of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area at Geldeston.
- 9.4.195 A review of the relevant Local Authority SFRAs [224], [225], [226] indicates that the proposed AWRP to River Waveney Pipeline study area is located within Flood Zone 3b. The areas of Flood Zone 3b within the study area are associated with several watercourses across the three districts.



9.4.196 A review of RoFRS + CC mapping [227] indicates that there is no significant increase in the spatial extent of fluvial flood risk within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area as a result of climate change. While climate change mapping identifies areas of increased flood risk, these are confined to locations already classified as high and medium risk within Flood Zone 3 and already interacting with the study area.

#### *Surface Water*

9.4.197 RoFSW mapping [228] indicates that there are areas of high – low risk across the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and study area. There is significant risk in the south of the proposed AWRP to River Waveney Pipeline study area, associated with the low-lying Broadlands land. Part of this risk extent is represented within the Flood Zone mapping and is more likely to be associated with fluvial floodplains rather than surface water flood risk.

9.4.198 From Stockton to Gillingham, there is an overland flow path that flows through the study area in the western end, associated with high – low risk. Some of the flow paths likely indicate the presence of an ordinary watercourse which was not included within OS Open River mapping [229]. The watercourse drains into the River Waveney's unnamed tributaries. Additional flow paths represent additional tributaries of unnamed watercourses across the study area, with the mapping indicate draining into the aforementioned larger flow path.

9.4.199 There are small, isolated areas of ponding across the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and study area, associated with high-low risk. These areas of ponding correlate with localised variation in topography. Additional ponding in the study area is associated with impermeable area residential areas.

9.4.200 A review of RoFSW + CC mapping [230] indicates that areas of ponding will have larger areas associated with more frequent events. No new areas of ponding or overland flow pathways are anticipated.

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### Groundwater

- 9.4.201 The South Norfolk SFRA [231] includes a 1% (1 in 100) AEP Groundwater Flood Map, which shows that a large section of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and study area are shown to have groundwater levels between 0.5m and 5m below the ground surface, with lesser areas shown to have groundwater levels within 25mm of the ground surface around Burgh St. Peter and Wheatacre.
- 9.4.202 The East Suffolk SFRA [232] uses the BGS Susceptibility to Groundwater Flooding dataset, which classifies most of the eastern part of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area as having '*limited potential for groundwater flooding to occur*'. To the east of Somerleyton, there is a small area with potential for groundwater flooding to occur of property situated below ground level.
- 9.4.203 However, these datasets are only intended to provide a broad scale picture of groundwater flood hazard, or where groundwater might emerge. Site-specific groundwater flood risk will be assessed during the next stage of the EIA process to inform the assessment in the water environment chapter of the ES.

### Reservoir

- 9.4.204 EA Reservoir Flood Risk mapping [233], [234] indicates that the proposed AWRP to River Waveney Pipeline study area is located within mapped risk extents for both dry and wet days. There is a small area of risk extent associated with dry day flood events, in the southeasternmost extent of the proposed AWRP to River Waveney Pipeline study area. Wet day risk extent is largely present across the south of the proposed AWRP to River Waveney Pipeline study area, around the floodplain of the River Waveney. Both dry and wet day reservoir flood risk is associated with the Ditchingham Lake Reservoir.

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## Other Sources

### *Tidal*

- 9.4.205 The nearest tidal influenced watercourse to the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area is the River Waveney. Parts of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area are within the watercourse's tidal reach and will have varying levels of tidal flood risk. The tidal limit for the River Waveney is defined as Ellingham Mill [235] which at its closest point is located approximately 1km south of the section. Despite being a tidal watercourse, flows and ranges have been described to be less significant between Oulton Dyke and Geldeston [236].
- 9.4.206 A review of the relevant SFRA documents [237], [238] indicate historical reports of tidal flooding within the vicinity of the proposed AWRP to River Waveney Pipeline study area. Tidal storm surges have been recorded from as early as 1888. The tidal flooding incidents documented within the East Suffolk SFRA do not provide specific locations and were along the East Suffolk Coastline.

### *Canal*

- 9.4.207 A review of canal mapping [239] indicates that there are no canals in the vicinity of the proposed AWRP to River Waveney Pipeline study area. Therefore, no flood risk is anticipated from this source.

### *Historic*

- 9.4.208 The EA's Recorded Flood Outlines [240] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising records from as early as 1946. The mapping indicates that fluvial flood events have been recorded within the proposed AWRP to River Waveney Pipeline study area. The recorded flood events are fluvial flooding associated with the River Waveney.
- 9.4.209 A review of the relevant Local Authority SFRAs [241], [242], [243] indicates that there have been reports of flooding within the vicinity of the proposed

AWRP to River Waveney Pipeline section of the EIA Scoping Area and study area. The flooding is documented from 1888, and includes tidal, coastal, fluvial and surface water flood events.

## **Proposed Barsham WTW to CSR Pipeline**

### **Statutory Designations**

9.4.210 There are no international sites or nationally designated sites within the proposed Barsham WTW to CSR Pipeline study area [244].

9.4.211 GWDEs will be discussed in the groundwater section below.

### **Surface Water Receptors**

9.4.212 A total of nine SMRs are located within the proposed Barsham WTW to CSR Pipeline study area. Within this section, the watercourses will be described in the order they appear north to south along the proposed Barsham WTW to CSR Pipeline study area.

9.4.213 Barsham Beck originates near Ilketshall St Andrew and flows northeast to join the River Waveney [245]. This watercourse is part of the WFD Waveney (Ellingham Mill – Burgh St. Peter) Water Body catchment (GB105034045903) [246]. There are more details about this WFD catchment in paragraph 9.4.181.

9.4.214 To the south of Barsham Beck, there is an unnamed SMR which is a tributary of the Hundred River (Lothingland). It originates near Grove Farmhouse and flows east, following agricultural ditches around arable fields before joining other headwaters of the Hundred River (Lothingland) [247].

9.4.215 Further south, an additional SMR arises from a combination of agricultural field drains and flows eastwards to join the headwaters of the Hundred River (Lothingland) [248]. South of this, a further SMR, also contributes to the Hundred River (Lothingland) headwaters. This originates near Halesworth Road and flows southeast, past Little Beck Farm [249].

Together, these watercourses form the headwaters of the Hundred River (Lothingland), which ultimately discharges into the North Sea.

- 9.4.216 Further south along the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area an additional three SMRs are present. The most northerly of these is an unnamed watercourse which is formed of two separate branches. These branches combine and the watercourse flows south, flowing parallel to Wash Lane for an extended length. Although the watercourse is not designated under the WFD, it falls within the Blyth (u/s Halesworth) Water Body (GB105035046070) [250] catchment.
- 9.4.217 The next watercourse to the south is a SMR which is an unnamed tributary forming part of the headwaters of the River Blyth. This watercourse is designated as the Blyth (u/s Halesworth) Water Body (GB105035046070) [251] under the WFD. It flows from two separate branches, one from agricultural field drains near St James' Lane and one from agricultural drains near New Road. These watercourses converge near Hill House and flow through Wisset, flowing parallel to The Street for a large section. This watercourse flows through Halesworth before joining the River Blyth [252].
- 9.4.218 To the south, another SMR and unnamed watercourse of the River Blyth is present. This watercourse is classified as the Chediston Watercourse Water Body (GB105035046050) under the WFD [253]. This watercourse originates near Linstead Green and flows east, parallel to Chediston Road until it reaches another watercourse to the west of Halesworth [254].
- 9.4.219 Further south, the River Blyth flows through the proposed Barsham WTW to CSR Pipeline study area. This section of the river is covered by the WFD Blyth (Hevingham Hall – d/s Halesworth) Water Body catchment (GB105035046030) [255]. Finally, south of the Blyth, another SMR which is a tributary of the River Blyth falls within the proposed Barsham WTW to CSR Pipeline study area. This watercourse originates near Broad Oak Farm and Walpole Road and flows east, joining the River Blyth near Blackheath [256].

9.4.220 Numerous smaller ditches and drainage features are present, typically associated with the surrounding arable and pasture land [257]. There are also multiple ponds within the proposed Barsham WTW to CSR Pipeline study area. For example, there are three large lakes to the south of Halesworth. While the larger waterbodies may be described in further detail where relevant, not all ponds have been individually quantified at this scoping stage and instead will be assessed as part of the water environment chapter of the ES.

#### *Surface Water Supply*

9.4.221 There is only one surface water abstraction point within the proposed Barsham WTW to CSR Pipeline study area at Old Hall Farm in Walpole (NGR: TM 36790 75060) [258]. This surface water abstraction point abstracts out of the River Blyth, and it is used for spray irrigation.

#### *Hydromorphology*

9.4.222 Watercourses within the proposed Barsham WTW to CSR Pipeline study area are typically lowland, modified systems, often managed for drainage and flood risk purposes.

9.4.223 Barsham Beck exhibits evidence of hydromorphological modification, particularly in the upper reaches, where the channel appears to have been straightened and realigned to facilitate agricultural practises [259]. There are multiple agricultural field drains which feed into this watercourse around the headwaters and the watercourse is culverted multiple times beneath roads [260]. Further downstream, in the vicinity of Bungay Road, the channel displays a more natural, sinuous planform. However, as the watercourse joins the River Waveney, the channel becomes straight with reinforced banks [261]. Flow conditions in this section are controlled by a sluice into the River Waveney, resulting in over-widening of the channel upstream of this structure.

9.4.224 To the south, the remaining SMRs comprise unnamed tributaries and the headwaters of the Hundred River (Lothingland). Similar to Barsham Beck,

these watercourses are typically drainage for agricultural purposes, with areas of straight planform and artificial reinforcement [262]. Surrounding land use is dominated by arable fields, with some limited areas of broadleaved, mixed woodland in the riparian zone [263]. All these tributaries are intersected by roads and field tracks at various points, where they are either culverted or they flow beneath the bridges. The mostly southern tributary of the Hundred River (Lothingland) appears the most natural watercourse out of the three, with some evidence of sinuosity [264]. However, it still remains influenced by surrounding agricultural land use.

9.4.225 Further south again are the SMRs which are tributaries of the River Blyth. The watercourse furthest north out of the three originates from a collection of agricultural field drains, eventually feeding into a more sinuous and natural watercourse with some meanders evident. However, this watercourse is evidently modified, for example, a long section flows parallel to Wash Lane where it flows in a straight in an artificially modified channel [265]. The watercourse has riparian broadleaved, mixed woodland along most of its length, with higher concentrations in the upper reaches. Wider land use is dominated by arable land and neutral grasslands [266].

9.4.226 To the south of this is the next SMR which is an unnamed tributary and originates from two separate headwaters, both of which flow through predominantly agricultural land. It has been modified in the past, flowing parallel to The Street (road) for most of its length in a likely reinforced channel [267]. The section of the watercourse flows through arable land again, with riparian broadleaved, mixed woodland [268]. The watercourse flows past three large lakes to the north of the channel, which are used recreationally and appear to be artificially reinforced [269]. Downstream of this location, the watercourse has natural meandering planform, with LiDAR data showing evidence of erosion in places [270]. This suggests that these sections of the watercourse are likely to be more natural. The watercourse then meanders to the east, where it is joined by an unnamed SMR. Downstream, it flows through the urban area of Halesworth where it flows beneath a road, the bridge infrastructure likely impacting the naturalness of



the banks here. Downstream of this bridge, the watercourse splits into two with the additional channel being called New Reach [271].

9.4.227 The SMR, Chediston Watercourse, originates near Linstead and flows east, predominantly through arable land [272]. The watercourse appears to have maintained some natural geomorphological features, with the planform being generally meandering throughout. LiDAR data suggest some areas of erosion. However, due to the dominance of agricultural land use, it is likely that the watercourse has been modified in the past to accommodate this [273]. Limited riparian broadleaved, mixed woodland is present for much of the watercourse with the wider land use being arable and neutral grassland [274].

9.4.228 Within the proposed Barsham WTW to CSR Pipeline study area, south of the Chediston Watercourse, the River Blyth flows from Laxfield east to the North Sea. The river has a meandering and sinuous planform through the proposed Barsham WTW to CSR Pipeline study area, with a large floodplain comprised of multiple drains and ditches [275]. Riparian broadleaved, mixed woodland occurs occasionally but immediate land use is dominated with neutral grassland throughout [276]. Within the proposed Barsham WTW to CSR Pipeline study area, the river passes under some road bridges, with the reinforcement related to this likely impacting the naturalness of the banks locally. There is evidence of some sections being realigned and straightened in the past, especially in the upstream sections of the study area. Within the proposed Barsham WTW to CSR Pipeline study area, the watercourse appears to have been disconnected from one of its meanders, creating an additional channel in the floodplain [277].

9.4.229 Finally, the SMR which forms the upper reaches of an unnamed tributary of the River Blyth fall within the proposed Barsham WTW to CSR Pipeline study area. Similarly to other watercourses in the area, the upper reaches are dominated by arable land with the watercourse displaying a straight planform around these fields [278].



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*Surface Water Quality*

- 9.4.230 The physico-chemical data for the seven WFD catchments within the proposed Barsham WTW to CSR Pipeline study area are shown in Table 9-13. This includes:
- Waveney (Ellingham Mill – Burgh St. Peter) Water Body (GB105034045903), described in paragraph 9.4.181.
  - Lothingland Hundred Water Body (GB105035046251).
  - Blyth (u/s Halesworth) Water Body (GB105035046070).
  - Chediston Watercourse Water Body (GB105035046050).
  - Blyth (Hevingham Hall – d/s Halesworth) Water Body (GB105035046030).
  - Blyth (New Reach through Halesworth) Water Body (GB105035046040).
  - Wenhaston Watercourse Water Body (GB105035046010), described in paragraph 9.4.105.
- 9.4.231 The Blyth (u/s Halesworth) WFD Water Body, Lothingland Hundred WFD Water Body, Chediston Watercourse WFD Water Body and Blyth (New Reach through Halesworth) WFD Water Body are all classified as having a ‘moderate’ ecological status (under WFD Cycle 3 Classification). RNAG for these water bodies are attributed to physical modifications from flood protection, pollution from roads and flow pressures from the water industry which can lead to impacts on the hydrological regime [279].
- 9.4.232 WFD Blyth (Hevingham Hall – d/s Halesworth) Water Body is classified as having ‘good’ ecological status (under WFD Cycle 3 Classification) [280].
- 9.4.233 The WFD data does allow for an understanding of water quality pressures within each catchment, and this has been outlined in Table 9-13.

Table 9-13: Summary of Cycle 3 Classification Physico-chemical Data for the WFD Catchments within the Proposed Barsham WTW to CSR Pipeline Study Area [281].

|                                           | Waveney (Ellingham Mill – Burgh St. Peter) Water Body |          | Lothingland Hundred Water Body |          | Blyth (u/s Halesworth) Water Body |          | Chediston Watercourse Water Body |          | Blyth (New Reach through Halesworth) Water Body |      | Blyth (Hevingham Hall – d/s Halesworth Water Body) |      |
|-------------------------------------------|-------------------------------------------------------|----------|--------------------------------|----------|-----------------------------------|----------|----------------------------------|----------|-------------------------------------------------|------|----------------------------------------------------|------|
|                                           | 2019                                                  | 2022     | 2019                           | 2022     | 2019                              | 2022     | 2019                             | 2022     | 2019                                            | 2022 | 2019                                               | 2022 |
| Overall Physico-chemical quality elements | Moderate                                              | Moderate | Moderate                       | Moderate | Moderate                          | Moderate | Moderate                         | Moderate | High                                            | High | Good                                               | Good |
| Ammonia (Phys-Chem)                       | High                                                  | High     | High                           | High     | High                              | High     | High                             | High     | High                                            | High | High                                               | High |
| Dissolved Oxygen                          | Moderate                                              | Moderate | Poor                           | Poor     | Moderate                          | Moderate | Poor                             | Poor     | High                                            | High | Good                                               | Good |
| Phosphate                                 | Moderate                                              | Good     | High                           | High     | High                              | Good     | Good                             | Good     | High                                            | High | High                                               | High |
| Temperature                               | Moderate                                              | Good     | High                           | High     | High                              | High     | High                             | High     | High                                            | High | High                                               | High |
| pH                                        | High                                                  | High     | High                           | High     | High                              | High     | High                             | High     | High                                            | High | High                                               | High |

9.4.234 There are multiple consented discharge points within the proposed Barsham WTW to CSR Pipeline study area which are shown in Table 9-14.

Table 9-14: Environment Agency Consented Discharge Points within the Proposed Barsham WTW to CSR Pipeline Study Area [282].

| Name of Site                      | Permit Number | NGR          | Receiving Water Body       | Type of Outlet |
|-----------------------------------|---------------|--------------|----------------------------|----------------|
| Barsham WTW                       | PR4NF360X     | TM4053089550 | Tributary of River Waveney | Trade          |
| Barsham WTW                       | PRENF10319    | TM4057089170 | Tributary of River Waveney | Trade          |
| Ilketshall (St.Lawrence)          | AW4NF313X     | TM3820083600 | Tributary of Hundred River | Sewage         |
| Walpole Waterworks                | PR4NF1127X    | TM3803775712 | Tributary of River Blyth   | Trade          |
| Walpole Treatment Works           | PRENF10047    | TM3803075700 | Tributary of River Blyth   | Sewage         |
| Walpole (Hamlet) Pumping Station  | ASENF12051    | TM3727075240 | River Blyth                | Sewage         |
| Walpole (Village) Pumping Station | ASENF12052    | TM3643074550 | River Blyth                | Sewage         |

### Groundwater

9.4.235 BGS mapping [283] indicates that the superficial deposits underlying the majority of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area comprise the Lowestoft Formation (Diamicton). Within the Barsham WTW to CSR Pipeline study area, additional mapped exposures include:

- Breydon Formation (peat).
- Lowestoft Formation (sand and gravel).
- Aldeby Sand and Gravel Member (sand and gravel).
- Head (clay, silt, sand and gravel).
- Happisburgh Glacigenic Formation (sand).
- Alluvium (clay, silt, sand and gravel).

9.4.236 The bedrock geology underlying the entirety of the proposed Barsham WTW to CSR Pipeline study area comprises the Crag Group (sand) [284].

- 9.4.237 The majority of the superficial deposits beneath the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area are classified by the EA as a Secondary (undifferentiated) aquifer. The superficial deposits (Alluvium) underlying The Beck are designated as a Secondary A aquifer [285].
- 9.4.238 The Crag Group (Sand) is designated by the EA as a Principal aquifer [286].
- 9.4.239 The very north of the proposed Barsham WTW to CSR Pipeline study area sit within the WFD Broadland Rivers Chalk and Crag groundwater body (GB40501G400300), which is classified as having a ‘poor’ overall status [287]. The rest of the proposed Barsham WTW to CSR Pipeline study area is located within the Waveney and East Suffolk Chalk and Crag groundwater body (GB40501G400600), which is also classified as having a ‘poor’ overall status [288]. RNAG are outlined in paragraphs 9.4.27 and 9.4.110, respectively.
- 9.4.240 The majority of the proposed Barsham WTW to CSR Pipeline study area lies within a medium groundwater vulnerability zone [289]. The Alluvium, Lowestoft Formation (Sand and gravel) and Aldeby Sand and Gravel member are classified as Secondary A aquifers are designated as having a medium - low groundwater vulnerability, including those located within the proposed Barsham WTW to CSR Pipeline study area [290]. Medium - low groundwater vulnerability refers to areas where natural geological barriers provide moderate to significant protection to underground aquifers against surface pollutants [291]. There are no SgZs (groundwater) within the proposed Barsham WTW to CSR Pipeline study area.
- 9.4.241 There are no nature conservation sites (as outlined in paragraph 9.4.210) with a statutory national or internationally designation within the proposed Barsham WTW to CSR Pipeline study area. This aligns with the EA’s GWDTE dataset [292] which confirms that there are no SSSIs classified as GWDTE in the study area. However, it is possible that wetland habitats with a national non-statutory designation, or no designation, are present and

which could constitute GWDTE classification. These will be identified through the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.

9.4.242 According to the EA's SPZ map, the entire proposed Barsham WTW to CSR Pipeline study area is located within a Zone 3 (Total Catchment) SPZ. Four Zone 2 (Outer Protection Zones) and Zone 1 (Inner Protection Zones) are also present within the proposed Barsham WTW to CSR Pipeline study area: with one situated at the northern extent of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area close to Beccles, and three located in the south around Halesworth. The proposed Barsham WTW to CSR Pipeline study area is located within an NVZ [293].

9.4.243 There are no consented discharges to ground within the proposed Barsham WTW to CSR Pipeline study area.

9.4.244 There are two licenced groundwater abstractions within the proposed Barsham WTW to CSR Pipeline study area [294] which could be impacted by the Proposed Development (Table 9-15). There may also be PWSs operating within the study area and this information will be requested from the relevant Local Authority as part of the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.

Table 9-15: Licenced Groundwater Abstractions within the Proposed Barsham WTW to CSR Pipeline Study Area.

| Licence Number  | NGR               | Maximum Annual Quantity (m <sup>3</sup> ) | Maximum Daily Quantity (m <sup>3</sup> ) | Purpose                          |
|-----------------|-------------------|-------------------------------------------|------------------------------------------|----------------------------------|
| 7/34/19/*G/0129 | TM 42030<br>87680 | 9,100                                     | 164                                      | Spray irrigation-direct          |
| 7/35/02/*G/0148 | TM 36460<br>73211 | 6,000                                     | 173                                      | Fish farm/Cress pond throughflow |

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## Flood Risk

### *Fluvial*

- 9.4.245 The FMfP [295] indicates that there are areas of Flood Zone 3 and Flood Zone 2 in the study area. The Flood Zones within the proposed Barsham WTW to CSR Pipeline study area are associated with all aforementioned watercourses. Within the study area, Flood Zones are associated with the Hundred River (and its tributaries), The Beck (and its tributaries) and the River Blythe (and its tributaries).
- 9.4.246 A review of the relevant Local Authority SFRA [296] indicates that the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and study area are located within Flood Zone 3b. The areas of Flood zone 3b that interact with the study area are associated with the River Blyth and is located immediately west of Halesworth. In the proposed Barsham WTW to CSR Pipeline study area, Flood Zone 3b is associated with the River Blyth and the Hundred River.
- 9.4.247 A review of RoFRS + CC mapping [297] indicates that there would be minor increases in the extent of fluvial floodplains within the proposed Barsham WTW to CSR pipeline section of the EIA Scoping Area and study area, with small areas of medium risk being associated with high risk.

### *Surface Water*

- 9.4.248 RoFSW mapping [298] indicates that there are areas of high – low risk across the proposed Barsham WTW to CSR pipeline section of the EIA Scoping Area and study area.
- 9.4.249 Within the study area, the areas of surface water flood risk are overland flow paths, associated with high – low risk. The flow paths drain towards existing rivers in the Main River mapping [299], and some are more likely to represent smaller, ordinary watercourses and drainage ditches not picked up by Open River mapping [300]. There is significant surface water ponding to the southwest of Halesworth, surrounding the River Blyth. In addition to this, there are significant areas of surface water ponding throughout the

proposed Barsham WTW to CSR pipeline section of the EIA Scoping Area, associated with high – low risk.

- 9.4.250 A review of RoFSW + CC mapping [301] indicates that the mapped surface water flood risk will have a minor increase in extent, with overland flow paths and areas of ponding having larger areas associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated.

#### Groundwater

- 9.4.251 The East Suffolk SFRA [302] uses the BGS Susceptibility to Groundwater Flooding dataset, which classifies the majority of the proposed Barsham WTW to CSR pipeline section of the EIA Scoping Area and study area as having *‘limited potential for groundwater flooding to occur’*. To the west and southwest of Halesworth, the floodplains of The Beck, its unnamed tributary and the River Blyth are shown to have potential for groundwater flooding to occur both at the ground surface and to property situated below ground level.
- 9.4.252 However, this dataset is only intended to provide an indication of where groundwater might emerge and does not show the likelihood of groundwater flooding occurring. Site-specific groundwater flood risk will be assessed during the next stage of the EIA process to inform the assessment in the water environment chapter of the ES.

#### Reservoir

- 9.4.253 EA Reservoir Flood Risk mapping [303], [304] indicates that the proposed Barsham WTW to CSR Pipeline study area is located within mapped risk extents for both dry and wet days. There is a small area of risk extent associated with dry day flood events, in the south of the study area, where the River Blyth crosses the study area south of Halesworth. The risk is associated with Heveningham Hall Upper Lake.

9.4.254 In the northernmost end of the proposed Barsham WTW to CSR Pipeline study area, wet day risk extent is present, around the floodplain of the River Waveney. The risk is associated with the Ditchingham Lake Reservoir.

### Other Sources

#### *Tidal*

9.4.255 The proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and study area interacts with three tidal watercourses, comprising the Hundred River, River Blyth and River Waveney.

9.4.256 The proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and study area is located upstream of the River Blyth's and Hundred River's tidal limits [305], [306] but within the River Waveney's tidal limits (defined as Ellingham Mill [307]). Therefore, there is a flood risk anticipated from this source.

9.4.257 A review of the East Suffolk SFRA [308] indicates historical reports of tidal flooding within the vicinity of the proposed Barsham WTW to CSR Pipeline study area. Tidal storm surges have been recorded from as early as 1888. The tidal flooding incidents documented within the East Suffolk SFRA do not provide specific locations and were along the East Suffolk coastline.

#### *Canal*

9.4.258 A review of canal mapping [309] indicates that there are no canals in the vicinity of the proposed Barsham WTW to CSR Pipeline study area. Therefore, no flood risk is anticipated from this source.

#### *Historic*

9.4.259 The EA's Recorded Flood Outlines [310] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising records from as early as 1946. The mapping indicates that previous flood events have been recorded within the proposed Barsham WTW to CSR Pipeline study area. The recorded flood events are fluvial flooding associated with The Beck, located in Halesworth to the east.



9.4.260 A review of the East Suffolk SFRA [311] indicates fluvial flood events associated with the Hundred River (in 1979 and 1981) and the River Blyth (in 1981). The SFRA does not detail the exact location of the fluvial events, so it is unknown whether these were in the vicinity of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and study area.

## Proposed CSR to WSR Pipeline

### Statutory Designations

9.4.261 There are no international sites or nationally designated sites within the proposed CSR to WSR Pipeline section of the EIA Scoping Area or its study area [312].

9.4.262 GWDTEs will be discussed in the groundwater section below.

### Surface Water Receptors

9.4.263 There are three SMRs which fall within the proposed CSR to WSR Pipeline study area, comprising the River Yox, River Blyth and the River Dove. Furthermore, there are multiple ordinary watercourses, agricultural field drains and ponds within the study area. These have not been quantified at this scoping stage and instead will be assessed as part of the water environment chapter of the ES.

9.4.264 Within this section, the watercourses will be described in the order they appear starting in the east and moving towards the west along the proposed CSR to WSR Pipeline study area.

9.4.265 The River Yox originates around Ubbeston Green and flows through Sibton and Yoxford, where it becomes the Minsmere River. From this point onwards, it flows through Middleton and into the North Sea [313]. This watercourse is designated under the WFD as the Minsmere Old River Water Body (GB105035046270) [314].

9.4.266 To the northwest, the River Blyth, designated under the WFD as Blyth (Laxfield – Hevingham Hall) Water Body (GB105035046000) [315], also interacts with the proposed CSR to WSR Pipeline study area. It is a

lowland, low gradient river which originates from agricultural field drains near Laxfield. It flows east through Heveningham Hall and Walpole before eventually flowing into a tidal estuary between Southwold and Walberswick [316].

9.4.267 To the west of the River Blyth, there is an unnamed ordinary watercourse which passes directly through the proposed CSR to WSR Pipeline study area. This watercourse originates near Bedfield and flows north through agricultural field drains, before passing Horham and joining Gold Brook near Hoxne. Gold Brook is a tributary of the River Dove [317].

9.4.268 Further west is another ordinary, unnamed watercourse which forms the upper reaches of Gold Brook, a tributary of the River Dove. This watercourse originates near Redlingfield and flows north.

9.4.269 There is an ordinary, unnamed watercourse which is a tributary of the River Dove. This originates around Denham Street and flows west, past Cock's Road to join the River Dove near Hoxne Road [318].

9.4.270 The River Dove is a lowland river originating from several minor streams in the village of Bacton, Suffolk. The streams converge around Mendlesham before flowing north to discharge to the River Waveney near Diss [319]. The River Dove is designated under the WFD as the Dove Water Body (GB105034045710) [320].

9.4.271 To the east of the River Dove is another ordinary, unnamed tributary which originates around Brome, flowing west to join the River Dove around the Birdwalk Plantation [321].

#### *Surface Water Supply*

9.4.272 There is one surface water abstraction point within the proposed CSR to WSR Pipeline study area at Peck's Farmhouse in Brome (NGR: TM 15262 74519). This abstracts from the River Dove and is used for direct spray irrigation [322].

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*Hydromorphology*

- 9.4.273 The upper reaches of the River Yox are directly within the proposed CSR to WSR Pipeline section of the EIA Scoping Area. In this section, the watercourse flows predominantly through agricultural land and is intermittently culverted beneath a road. The channel exhibits a notably straight planform throughout [323]. Riparian woodland present in the upper reaches. However, further downstream, this cover becomes limited, with agricultural land encroaching the river margins [324]. Near Low Grange Farm, a small tributary joins the watercourse from a pond at Wood Farm, downstream of which the riparian woodland begins to increase again. The channel does not exhibit many natural geomorphological features and there is limited change in the planform or surrounding land use between historical and current mapping [325].
- 9.4.274 The River Blyth has undergone historical modification to support agricultural drainage and navigation. East of Halesworth, sections of the river have been made navigable, including the installation of concrete bank reinforcement [326]. Within the proposed CSR to WSR Pipeline study area, the river is culverted at locations where it passes beneath roads. Around Heveningham, multiple channels are present across the floodplain, reflecting historical agricultural drainage practices in the area. These channels were constructed to take excess water off the broad, flat floodplain and into the rivers. This section of the watercourse appears consistent with historical mapping from 1884, indicating that these modifications occurred prior to this date [327].
- 9.4.275 East of the River Blyth, an unnamed ordinary watercourse which passes through the proposed CSR to WSR Pipeline study area to the east of Horham. Within this reach, the watercourse exhibits some natural geomorphological characteristics, including a meandering planform, particularly in the lower reaches [328]. It flows predominantly through agricultural land, receiving flows from multiple field drains. While some sections have been subject to localised straightening the watercourse overall retains a semi-natural character [329]. Riparian woodland is semi-

continuous along its course, although some areas have notable agricultural encroachment [330].

- 9.4.276 To the west of the aforementioned watercourse lies another unnamed ordinary watercourse, forming the headwaters of Gold Brook. Originating near Redlingfield, it flows northwards, with a substantial section of the channel running adjacent to Low Road [331]. This proximity suggests likely bank reinforcement associated with the road corridor. Comparison with historical mapping (from 1884) indicates that there has been limited change in planform at a catchment scale [332].
- 9.4.277 An unnamed ordinary tributary of the River Dove originates around Denham Street, primarily fed by agricultural field drains. From Filnworth Hall, the watercourse flows west through arable fields and exhibits a straight, managed planform. Semi-continuous riparian woodland is present along much of its length. However, agricultural land encroaches significantly on the channel margins. The watercourse is culverted beneath Cock's Road before joining the River Dove near Hoxne Road [333].
- 9.4.278 To the east of Eye, the River Dove flows north through the proposed CSR to WSR Pipeline section of the EIA Scoping Area. This reach passes primarily through arable farmland with occasional woodland. The river follows a meandering planform, which appears broadly unchanged compared to historical mapping from 1884. However, evidence of historical modification for agricultural drainage is present [334], including multiple straightened channels within the floodplain. In-channel structures are limited, with only a small number of culverts associated with road crossings [335]. Riparian cover occurs intermittently along the reach, with denser woodland areas at locations such as Waterloo Plantation and Big Carr. In some sections, agricultural land encroaches onto the riverbanks [336]. Overall, while the river displays some natural geomorphological processes, it remains influenced by historical drainage modifications and surrounding agricultural land use.

9.4.279 The River Dove is designated as a HMWB due to past channel alterations associated with agricultural drainage and milling activities. Infrastructure linked to The Old Mill remains present within the channel near Oakley. These modifications have altered the river's natural geomorphology, with mill-related structures significantly affecting sediment transfer processes [337].

9.4.280 East of the River Dove lies another unnamed ordinary tributary, which originates near Brome. This watercourse flows east through arable land, exhibiting a predominantly straight planform and passes beneath field tracks via culverts in several locations [338]. It flows through areas of riparian woodland, including the more extensive wooded area named Birdwalk Plantation in its lower reaches [339].

#### *Water Quality*

9.4.281 The physico-chemical data for the seven WFD catchments within the proposed CSR to WSR Pipeline study area are shown in Table 9-16. This includes:

- Blyth (Laxfield – Hevingham Hall) Water Body (GB105035046000).
- Blyth (Hevingham Hall – d/s Halesworth) Water Body (GB105035046030), described previously in paragraph 9.4.230.
- Minsmere Old River Water Body (GB105035046270).
- Alde Water Body (GB105035046060).
- Tributary of Waveney Water Body (GB105034045741).
- Chickering Beck Water Body (GB105034045690).
- Dove Water Body (GB105034045710).

9.4.282 The Blyth (Laxfield – Hevingham Hall) WFD Water Body classified as having 'good' ecological status (under WFD Cycle 3 Classification). However, this water body is a HMWB. Existing pressures on the water body include physical modifications from flood protection and pollution from agricultural management causing issues for fish populations [340].

9.4.283 The Minsmere Old River WFD Water Body, Alde WFD Water Body, Tributary of Waveney WFD Water Body, Chickering Beck WFD Water

Body, and Dove WFD Water Body are all classified as having ‘moderate’ ecological status (under WFD Cycle 3 Classification). RNAG for these water bodies are attributed to physical modifications such as barriers and land drainage, pollution from agriculture and the water industry, domestic and road runoff causing ecological discontinuity and therefore impacting fish populations.

Table 9-16: Summary of Cycle 3 Classification Physico-chemical Data for the WFD Catchments within the Proposed CSR to WSR Pipeline Study Area.

|                                           | Dove Water Body |          | Blyth (Laxfield – Hevingham Hall) |      | Minsmere Old River Water Body |          | Alde Water Body |          | Tributary of Waveney Water Body |          | Chickering Beck Water Body |          | Blyth (Hevingham Hall – d/s Halesworth) Water Body |      |
|-------------------------------------------|-----------------|----------|-----------------------------------|------|-------------------------------|----------|-----------------|----------|---------------------------------|----------|----------------------------|----------|----------------------------------------------------|------|
|                                           | 2019            | 2022     | 2019                              | 2022 | 2019                          | 2022     | 2019            | 2022     | 2019                            | 2022     | 2019                       | 2022     | 2019                                               | 2022 |
| Overall Physico-chemical quality elements | Moderate        | Moderate | Good                              | Good | Moderate                      | Moderate | Moderate        | Moderate | Moderate                        | Moderate | Moderate                   | Moderate | Good                                               | Good |
| Ammonia (Phys-Chem)                       | High            | Poor     | High                              | High | High                          | High     | High            | High     | High                            | Good     | Moderate                   | Good     | High                                               | High |
| Dissolved Oxygen                          | Poor            | Good     | Good                              | Good | Poor                          | Moderate | Poor            | Poor     | Good                            | Bad      | Moderate                   | Bad      | Good                                               | Good |
| Phosphate                                 | Poor            | Moderate | High                              | High | High                          | Good     | High            | High     | Good                            | Moderate | Poor                       | Bad      | High                                               | High |
| Temperature                               | High            | High     | High                              | High | High                          | High     | High            | High     | High                            | High     | High                       | High     | High                                               | High |
| pH                                        | High            | High     | High                              | High | High                          | High     | High            | High     | High                            | High     | High                       | High     | High                                               | High |

9.4.284 There are a significant number of consented discharge points within the proposed CSR to WSR Pipeline study area. A subset of these have been included in Table 9-17 at this scoping stage. The full dataset will be provided in the water environment chapter of the ES.

Table 9-17: Environment Agency Consented Discharge Points within the Proposed CSR to WSR Pipeline Study Area [341].

| Name of Site                                       | Permit Number | NGR          | Receiving Water Body                     | Type of Outlet |
|----------------------------------------------------|---------------|--------------|------------------------------------------|----------------|
| Laxfield Water Recycling Centre Pumping Station AW | ASENF12095    | TM2997071960 | River Blyth                              | Sewage         |
| Wilby Sewage Treatment Works AW                    | ASENF122      | TM2522072330 | Tributary of Gold Brook                  | Sewage         |
| Horham Terminal Pumping Station AW                 | ASENF12060    | TM2134072310 | Gold Brook                               | Sewage         |
| Denham Shingle Sewage Treatment Works AW           | AW4NF404BX    | TM1850973524 | Gold Brook                               | Sewage         |
| Eye Hoxne Road Water Recycling Centre AW           | AW4NF64X      | TM1575074640 | Drain leading into River Dove            | Sewage         |
| Eye Hoxne Road Water Recycling Centre AW           | AW4NF64X      | TM1574074660 | Drain leading into River Dove            | Sewage         |
| Redlingfield Sewage Treatment Works AW             | AW4NF1098X    | TM1870071000 | Ditch leading to Tributary of River Dove | Sewage         |
| Stuston Sewage Treatment Works AW                  | ASENF87       | TM1287076950 | Tributary of River Waveney               | Sewage         |

### Groundwater

9.4.285 BGS mapping [342] indicates that the superficial deposits underlying the majority of the proposed CSR to WSR Pipeline study area comprise the



Lowestoft Formation (Diamicton). Within the proposed CSR to WSR Pipeline study area, additional mapped exposures include:

- Head (clay, silt, sand and gravel).
- Lowestoft Formation (sand and gravel).
- Alluvium (clay, silt, sand and gravel).
- Interglacial lacustrine deposits (clay and silt).
- River Terrace Deposits (sand and gravel).
- Peat.

9.4.286 The bedrock geology underlying the entire proposed CSR to WSR Pipeline study area comprises the Crag Group (sand) [343]. Three northeast to southwest trending faults are shown to cross the western half of the proposed CSR to WSR Pipeline section of the EIA Scoping Area, close to Russel's Green, Redlingfield and Eye. The displacement associated with each fault is unknown.

9.4.287 The majority of the superficial deposits beneath the proposed CSR to WSR Pipeline study area are classified by the EA as Secondary (undifferentiated) aquifer with small areas mostly associated with the Lowestoft Formation, Alluvium and River Terrace Deposits underlying the River Dove, River Vox and River Blythe being classified as Secondary A aquifers [344].

9.4.288 The Crag Group (sand) is designated by the EA as a Principal aquifer [345].

9.4.289 The proposed CSR to WSR Pipeline study area is split between two groundwater bodies. The western part of the proposed CSR to WSR Pipeline study area is located within the Broadland Rivers Chalk and Crag WFD groundwater body (GB40501G400300) [346] and the eastern part of the proposed CSR to WSR Pipeline study area is situated within the Waveney and East Suffolk Chalk and Crag WFD groundwater body (GB40501G400600) [347]. Both WFD groundwater bodies are classified as having a 'poor' overall status. RNAG are outlined in paragraphs 9.4.27 and 9.4.110, respectively.

- 9.4.290 Most of the proposed CSR to WSR Pipeline study area lies in an area classified as having a medium groundwater vulnerability. The western end of the proposed CSR to WSR Pipeline study area, between Denham Street and Brome Street, where the River Terrace, Lowestoft Formation (sand and gravel) and Alluvium deposits exist, is classified as medium - high groundwater vulnerability, with small, localised areas of peat classified as low groundwater vulnerability. There are no SgZs (groundwater) within the proposed CSR to WSR Pipeline study area.
- 9.4.291 There are no nature conservation sites (as outlined in paragraph 9.4.261) with an international or national designation within the proposed CSR to WSR Pipeline study area. This aligns with the EA's GWDTE dataset [348] which confirms that there are no SSSIs classified as a GWDTE in the study area. However, it is possible that wetland habitats with a national non-statutory designation, or no designation, are present and which could constitute GWDTE classification. These will be identified through the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.
- 9.4.292 According to the EA's SPZ map, most of the proposed CSR to WSR Pipeline study area lies within a designated Zone 3 (Total Catchment) SPZ. The nearest SPZ1 and SPZ2 are located approximately 1.3km and 1.2km from the proposed CSR to WSR Pipeline section of the EIA Scoping Area, respectively. The proposed CSR to WSR Pipeline study area is situated within an NVZ.
- 9.4.293 There are three consented discharges within the proposed CSR to WSR Pipeline study area that discharge to drains/ditches and have the potential to infiltrate to ground during times of low flow.
- 9.4.294 There is one licenced groundwater abstraction within the proposed CSR to WSR Pipeline study area [349] that could be impacted by the Proposed Development (Table 9-18). There may also be PWSs operating within the study area and this information will be requested from the relevant Local

Authority as part of the next steps in the EIA process to inform the water environment chapter of the ES.

Table 9-18: Licenced Groundwater Abstractions within the Proposed CSR to WSR Pipeline Study Area.

| Licence Number  | NGR                  | Maximum Annual Quantity (m <sup>3</sup> ) | Maximum Daily Quantity (m <sup>3</sup> ) | Purpose           |
|-----------------|----------------------|-------------------------------------------|------------------------------------------|-------------------|
| AN/034/0017/008 | TM<br>13914<br>75429 | 15,395                                    | 218                                      | Vegetable washing |

## Flood Risk

### Fluvial

- 9.4.295 The FMfP [350] indicates that there are areas of Flood Zone 3 and Flood Zone 2 in the proposed CSR to WSR Pipeline study area. Within the study area, the Flood Zones are associated with the Gold Brook and unnamed tributaries of the River Dove and generally do not expand far from the mapped watercourses. In the proposed CSR to WSR Pipeline study area, whilst the Flood Zones generally do not extend far from the mapped watercourses, there are larger areas which indicate larger floodplains and subsequent fluvial flood risk in the west of the study area, which is associated with the River Blyth.
- 9.4.296 A review of the relevant Local Authority SFRAs [351], [352] indicate that the proposed CSR to WSR Pipeline EIA Scoping Area and study area are located within Flood Zone 3b. The areas of Flood Zone 3b that interact with the proposed CSR to WSR Pipeline EIA Scoping Area and study area are associated with the River Dove and its tributaries (Gold Brook, two unnamed).
- 9.4.297 A review of RoFRS + CC mapping [353] indicates that there would be minor increases in the extent of fluvial floodplains within the proposed CSR to WSR Pipeline section of the EIA Scoping Area and study area, with areas of risk becoming associated with more frequent events.

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### Surface Water

- 9.4.298 RoFSW mapping [354] indicates that there are areas of high – low risk across the proposed CSR to WSR Pipeline section of the EIA Scoping Area and study area. The majority of the surface water flood risk present in the proposed CSR to WSR Pipeline EIA Scoping Area is overland flow paths which could represent other watercourses and drainage ditches not picked up by OS Open River mapping [355]. There are isolated areas of surface water ponding associated with high – low risk. There is a significant area of surface water ponding in the centre of the proposed CSR to WSR Pipeline section of the EIA Scoping Area, south of Horham. Further east, there is significant ponding in between the areas of Wilby and Laxfield. This ponding is both associated with impermeable area in the residential areas. The ponding extends both north and south of the proposed CSR to WSR Pipeline section of the EIA Scoping Area and into the study area. In lower risk events, mapping indicates that ponding would follow overland flow pathways and drain into the drainage ditches present.
- 9.4.299 A review of RoFSW + CC mapping [356] indicates that the mapped surface water flood risk will increase in extent, with overland flow paths and areas of ponding having larger areas associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated.

### Groundwater

- 9.4.300 The East Suffolk SFRA [357] uses the BGS Susceptibility to Groundwater Flooding dataset, which classifies most of the proposed CSR to WSR Pipeline section of the EIA Scoping Area and study area as having '*limited potential for groundwater flooding to occur*'. In the southeast of the proposed CSR to WSR Pipeline study area, within the River Yox's floodplain, there is a small area classified as having '*potential for groundwater flooding of property situated below ground level*'.
- 9.4.301 The Mid Suffolk SFRA [358] includes a 1% (1 in 100) AEP Groundwater Flood Map, which shows that the proposed CSR to WSR Pipeline section of the EIA Scoping Area and study area are mostly classified as 'negligible

risk'. In the west, close to the River Dove, there are areas shown to have groundwater levels between 0.5m and 5m and 0.025m and 0.5m below the ground surface, and within 0.025m of the ground surface, respectively.

- 9.4.302 However, these datasets are only intended to provide an indication of where groundwater might emerge and do not show the likelihood of groundwater flooding occurring. Site-specific groundwater flood risk will be assessed during the next stage of the EIA process to inform the assessment in the water environment chapter of the ES.

#### *Reservoir*

- 9.4.303 EA Reservoir Flood Risk mapping [359], [360] indicates that the study area is located within mapped risk extents for both dry and wet days. The proposed CSR to WSR Pipeline section of the EIA Scoping Area and study area are located outside of areas within the mapped reservoir flood risk extent, and therefore no flood risk is anticipated from this source.

#### **Other Sources**

##### *Tidal*

- 9.4.304 The River Yox is artificially managed at Minsmere Sluice [361] and therefore the proposed CSR to WSR Pipeline section of the EIA Scoping Area and study area are located upstream of its tidal limit. The River Blyth tidal limit is at Blythburgh [362], downstream of the study area. The River Dove is not a tidally influenced watercourse. Therefore, no flood risk is anticipated from this source.

##### *Canal*

- 9.4.305 A review of canal mapping [363] indicates that there are no canals in the vicinity of the proposed CSR to WSR Pipeline study area. Therefore, no flood risk is anticipated from this source.

##### *Historic*

- 9.4.306 The EA's Recorded Flood Outlines [364] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising

records from as early as 1946. The mapping indicates that no previous flood events have been recorded within the proposed CSR to WSR Pipeline study area.

9.4.307 A review of the relevant SFRA [365], [366] indicate that there have been historic flood events recorded. In the East Suffolk SFRA, fluvial flooding has been recorded from the River Blyth in 1981. However, the SFRA does not detail specific locations along the River Blyth in which flooding occurred.

9.4.308 The Mid Suffolk SFRA does not detail any flood events recorded in the vicinity of the proposed CSR to WSR Pipeline study area.

## **Proposed CSR to Saxmundham Pipeline**

### **Statutory Designations**

9.4.309 There are no international sites or nationally designated sites within the proposed CSR to Saxmundham Pipeline study area [367].

9.4.310 GWDTEs will be discussed in the groundwater section below.

### **Surface Water Receptors**

9.4.311 There are four SMRs which fall within the proposed CSR to Saxmundham Pipeline study area. Within this section, the watercourses will be described in the order they appear north to south along the proposed CSR to Saxmundham Pipeline study area.

9.4.312 North of the River Yox, there are three ordinary watercourses that function as tributaries of the River Yox [368]. The River Yox itself flows from Peasenhall through Sibton and Yoxford, where it transitions into the Minsmere River. One of its tributaries, the Gull, is classified as a SMR. It originates near Hemsey Wood and joins the River Yox downstream of Sibton [369].

9.4.313 South of the River Yox, there are three additional unnamed tributaries, all of which are also ordinary watercourses [370]. Further south within the proposed CSR to Saxmundham Pipeline study area, an ordinary

watercourse (a tributary of the River Alde) originates near Rendham Hall Farm. It flows south and joins the River Alde near Rendham.

- 9.4.314 An additional ordinary watercourse, known as Gull Stream, is a tributary of the River Fromus. It joins the river south of Carlton and originates near Lonely Farm Country Park, flowing through the holiday park and Lonely Wood [9]. There is also an unnamed SMR tributary of the River Fromus, which originates at the southern end of the proposed CSR to Saxmundham Pipeline study area and flows east through Saxmundham [371].
- 9.4.315 The River Fromus itself originates from agricultural drains near Rotten End, which is in close proximity to the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. It flows south through Kelsale and Saxmundham before eventually discharging to the River Alde to the southwest of Snape [372].
- 9.4.316 Other surface water receptors within this area include tributaries of the above watercourses, agricultural ditches and small ponds. Due to the low-lying nature of this area, there are a significant number of ditches present. These have not been quantified at this scoping stage [373] and instead will be assessed as part of the water environment chapter of the ES.

#### *Surface Water Supply*

- 9.4.317 According to the EA Water Abstraction Licenses Mapping, there are no surface water abstraction points within the proposed CSR to Saxmundham Pipeline study area [374].
- 9.4.318 The information on surface water abstractions was obtained from publicly available data sources. However, these data are from 2024 and may not be fully reflective of the baseline conditions currently. Therefore, additional data on surface water abstractions, discharges and PWSs will be requested to inform the assessment in the water environment chapter of the ES.

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*Hydromorphology*

- 9.4.319 To the north of the River Yox, there are three small, unnamed ordinary watercourse tributaries. The westernmost tributary is labelled as a ‘Drain’ on OS mapping and flows south, running parallel to Halesworth Road [375]. East of this lies a second tributary, also a straight agricultural drain, which flows parallel to Hollow Lane and joins the River Yox to the east of Sibton Park Estate [376]. The third tributary originates near Sibton Green and flows south through Cats Covert and Kendall’s Wood. In its upper reaches, it exhibits a more natural planform but becomes straightened further downstream. North of Sibton Park Estate, this watercourse is culverted, with its likely point of re-emergence discharging into a fish pond [377].
- 9.4.320 Immediately south of these tributaries lies the River Yox, which flows through the proposed CSR to Saxmundham Pipeline study area at Sibton.
- 9.4.321 Within the proposed CSR to Saxmundham Pipeline study area, the River Yox flows mainly through agricultural land interspersed with areas of woodland. Riparian tree cover is relatively high throughout. However, where the river flows through Sibton Park Estate, tree cover is limited [378]. In its upper reaches, the river runs parallel to Poys Street, where the banks appear to be reinforced and the channel has a straight planform. This section is also intersected by multiple small bridges providing access to adjacent properties [379].
- 9.4.322 As the river flows through Sibton Park Estate, it runs alongside a large pond, which appears to be supplied via a sluice from the River Yox. In this section, the riparian corridor consists of scattered trees and extensive grassland. Aerial imagery indicates that sections of the channel bank are experiencing erosion, potentially due to the limited presence of bank top vegetation [380]. Comparison with historical mapping from 1885 suggests that there has been no significant alteration to the channel planform and surrounding land use over time.
- 9.4.323 The Gull, a tributary of the River Yox, originates from agricultural drains around Hernsey Wood, where an additional tributary joins in its upper



headwaters. From its source, the watercourse transitions from straight agricultural field drains into a more natural planform, displaying geomorphological features such as bank erosion and the absence of embankments, as confirmed by LiDAR data. However, as it approaches Bruisyard Road, the channel becomes more modified, adopting a straight alignment parallel to the road. The watercourse then flows northeast, passing beneath several culverts at road crossings. From Peasenhall onwards, it runs parallel to Badingham Road within a highly straightened and reinforced channel [381].

- 9.4.324 To the south of the River Yox, there are three additional unnamed tributaries which are ordinary watercourses. The easternmost tributary flows from around East Wood, in a straight planform towards the River Yox, near Hemp Green. To the west, another unnamed tributary begins near Rendham Road and flows through a series of ponds and agricultural fields [382]. Another tributary, labelled as 'Drain' on OS mapping, originates near Hencoop Wood and flows northwards to join the River Yox near Askers Hill [383].
- 9.4.325 Further south, a tributary of the River Alde forms from a network of agricultural field drains around Rendham Hall Farm, Rookery Farm, and Hill Farm. These converge around Pipney Hill and continue flowing southward, eventually joining the River Alde near Rendham [384].
- 9.4.326 Gull Stream, the ordinary watercourse and tributary of the River Fromus, shows evidence of historical artificial modification. It flows through the centre of Carlton Mere Holiday Park, passing between two large lakes used for recreation. Comparisons with historical mapping from 1885 indicates that these lakes were not present at the time and were likely created later as part of the holiday park development. The watercourse passes beneath the A12 and several smaller roads via culverts. Downstream, as it approaches the River Fromus, the channel adopts a straight planform, which appears unchanged when compared to historical mapping from 1885 [385].

9.4.327 An unnamed main river tributary of the River Fromus flows west to east through a highly urban area of Saxmundham. Along its course, it is culverted under the A12 and several smaller roads and adjacent to residential areas in a straight planform [386]. It joins the River Fromus north of Lambsale Meadow. There is riparian tree cover throughout its length. Comparison with historical mapping shows that while the channel planform has remained largely consistent, there have been significant changes in the surrounding land use, with housing development expanding from the 1970s onwards [387].

9.4.328 The upper reaches of the River Fromus lie within the proposed CSR to Saxmundham Pipeline study area, to the east of Saxmundham. In this section, the river flows through a predominantly urban environment, bordered by housing estates on both sides. The channel is culverted beneath a railway line and crossed by multiple road bridges, with associated structural reinforcements likely impacting its natural geomorphology [388]. The river also appears to have been straightened to run parallel to Main Road north of Saxmundham. Historical mapping from 1885 shows no change in planform along this section, suggesting that channel modification occurred prior to that date [389].

#### *Water Quality*

9.4.329 The physico-chemical data for the three WFD catchments within the proposed CSR to Saxmundham Pipeline study area are shown in Table 9-19. This includes:

- Minsmere Old River Water Body (GB105035046270), described in paragraph 9.4.283.
- Fromus River Water Body (GB105035045980).
- Alde River Water Body (GB105035046060), described in paragraph 9.4.283.

9.4.330 The Fromus WFD Water Body is classified as having ‘poor’ ecological status (under WFD Cycle 3 Classification). It is not classified as an Artificial Water Body (‘AWB’) or HMWB. RNAG for this water body is attributed to

multiple pressures, including pollution from sewage discharges and trade discharges, and physical modifications which create barriers to ecological continuity [390].

Table 9-19: Overview of the Water Quality Data for each WFD Catchment within the Proposed CSR to Saxmundham Pipeline Study Area.

|                                                  | Fromus Water Body |          |
|--------------------------------------------------|-------------------|----------|
|                                                  | 2019              | 2022     |
| <b>Overall Physico-chemical quality elements</b> | Moderate          | Moderate |
| <b>Acid Neutralising Capacity</b>                | High              | High     |
| <b>Ammonia (Phys-Chem)</b>                       | High              | High     |
| <b>Biochemical Oxygen Demand</b>                 | N/A               | High     |
| <b>Dissolved Oxygen</b>                          | Bad               | Bad      |
| <b>Phosphate</b>                                 | Moderate          | High     |
| <b>Temperature</b>                               | High              | High     |
| <b>pH</b>                                        | High              | High     |

9.4.331 There are multiple consented discharge points within the proposed CSR to Saxmundham Pipeline study area. The details of these are outlined in Table 9-20. These discharges could be having a negative impact on the water quality of these watercourses, such as causing increases in nutrient levels within the watercourse [391].

Table 9-20: The Consented Discharge Sites within the Proposed CSR to Saxmundham Pipeline Study Area [392].

| Name of Site                              | Permit Number | NGR          | Receiving Water Body      | Type of Outlet |
|-------------------------------------------|---------------|--------------|---------------------------|----------------|
| Saxmundham Works<br>Northumbria Water Ltd | PRENF10046    | TM3789063130 | Tributary of River Fromus | Trade          |
| Carlton Meres Holiday Park                | PR4NF816X     | TM3660064900 | Gull Stream               | Sewage         |
| Grove House                               | EPRZB3092RK   | TM3502866985 | Tributary of River Alde   | Sewage         |
| Sibton Park                               | EPRFB3697VN   | TM3749870436 | Tributary of River Yox    | Sewage         |

### Groundwater

9.4.332 According to BGS mapping [393], the superficial deposits underlying the majority of the proposed CSR to Saxmundham Pipeline study area comprise the Lowestoft Formation (Diamicton). Within the proposed CSR to Saxmundham Pipeline study area, additional mapped exposures, mainly associated with the SMR include:

- Head (clay, silt, sand and gravel).
- Lowestoft Formation (sand and gravel).
- Alluvium (clay, silt, sand and gravel).

9.4.333 The bedrock geology underlying the entirety of the proposed CSR to Saxmundham Pipeline study area comprises the Crag Group (Sand) [394].

9.4.334 The majority of the superficial deposits beneath the proposed CSR to Saxmundham Pipeline study area are classified by the EA as a Secondary (undifferentiated) aquifer. Small areas, mostly associated with the Lowestoft Formation (sand and gravel) and Alluvium underlying the River Fromus and River Yox, are classified as Secondary A aquifers [395].

9.4.335 The Crag Group (sand) is designated by the EA as a Principal aquifer [396].

- 9.4.336 The proposed CSR to Saxmundham Pipeline study area is located within the Waveney and East Suffolk Chalk and Crag WFD groundwater body (GB40501G400600). The WFD groundwater body is classified as having a ‘poor’ overall status [397]. The RNAGs are outlined in paragraph 9.4.110.
- 9.4.337 The majority of the proposed CSR to Saxmundham Pipeline study area is designated as having medium groundwater vulnerability [398]. The southern end of the proposed CSR to Saxmundham Pipeline study area is classified as having medium – high [399] groundwater vulnerability corresponding to the Lowestoft Formation (sand and gravel) and Alluvium deposits. There are no SgZs (groundwater) within the proposed CSR to Saxmundham Pipeline study area.
- 9.4.338 There are no nature conservation sites with a statutory national or international designation within the proposed CSR to Saxmundham Pipeline study area. This aligns with the EA’s dataset [400] which confirms that there are no SSSIs classified as GWDTEs in the study area. However, it is possible that wetland habitats with a national non-statutory designation, or no designation, are present and which could constitute GWDTE classification. These will be identified through the water features survey which forms part of the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.
- 9.4.339 The EA’s SPZ map indicates that the majority of the proposed CSR to Saxmundham Pipeline study area lies within a Zone 3 (Total Catchment) SPZ, except for the section near Peasenhall. A Zone 2 (Outer Protection Zone) and a Zone 1 (Inner Protection Zone) are located adjacent to the southern end of the proposed CSR to Saxmundham Pipeline study area around the Saxmundham area. The study area is located within an NVZ [401].
- 9.4.340 There are no consented discharges to ground within the proposed CSR to Saxmundham Pipeline study area.

- 9.4.341 There are no licenced groundwater abstractions within the proposed CSR to Saxmundham Pipeline study area.

### **Flood Risk**

#### *Fluvial*

- 9.4.342 The FMfP [402] indicates that there are areas of Flood Zone 3 and Flood Zone 2 in the study area. Within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area, the Flood Zones are associated with the River Yox in the north, and the unnamed tributary of the River Fromus in the south. Additional fluvial flood zones in the proposed CSR to Saxmundham Pipeline study area are associated with unnamed tributaries of the aforementioned main rivers, which were not represented in watercourse mapping [403].
- 9.4.343 A review of the relevant Local Authority SFRA [404] indicate that the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and study area are located within Flood Zone 3b. The areas of Flood Zone 3b that interact with the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area are predominantly associated with the River Yox in the north of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. In the central eastern part of the Proposed CSR to Saxmundham Pipeline study area, there is a small area of Flood Zone 3b associated with the River Fromus.
- 9.4.344 A review of RoFRS + CC mapping [405] indicates that there would be minor increases in the extent of fluvial floodplains within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and study area, with areas of risk becoming associated with more frequent events.

### **Surface Water**

- 9.4.345 RoFSW mapping [406] indicates that there are areas of high – low risk across the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and study area. The mapping indicates overland flow pathways, some of which are likely to be additional unnamed ordinary

watercourses and drainage ditches not represented in OS Open River mapping [407]. These flow paths drain into the Yox and Fromus rivers or their tributaries.

- 9.4.346 In addition to this, surface water ponding is present throughout the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area, associated with high – low risk. The majority of the ponding is small and isolated. However, there are significant areas of ponding located in the north of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area associated with high – low risk. The extensive areas of ponding are in proximity to the River Yox, and many are also within mapped fluvial Flood Zones 2 and 3. Due to this, the extensive areas of ponding may represent fluvial flood risk or may also be due to the low elevation of the land either side of the watercourse, which prevents surface water from draining into the watercourse.
- 9.4.347 A review of RoFSW + CC mapping [408] indicates that the mapped surface water flood risk will increase in extent, with overland flow paths and areas of ponding having larger areas associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated.

### Groundwater

- 9.4.348 The East Suffolk SFRA [409] uses the BGS Susceptibility to Groundwater Flooding dataset, which classifies most of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and study area as having '*limited potential for groundwater flooding to occur*'. The floodplains of the River Yox and River Fromus are shown to have potential for groundwater flooding to occur to property situated below ground level.
- 9.4.349 However, this dataset is only intended to provide an indication of where groundwater might emerge and does not show the likelihood of groundwater flooding occurring. Site-specific groundwater flood risk will be assessed during the next stage of the EIA process in the water environment chapter of the ES.

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### Reservoir

- 9.4.350 EA Reservoir Flood Risk mapping [410], [411] indicates that the proposed CSR to Saxmundham Pipeline study area is located within mapped risk extents for both dry and wet days. The proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and study area are located outside of areas within the mapped reservoir flood risk extent, and therefore no flood risk is anticipated from this source.

### Other Sources

#### *Tidal*

- 9.4.351 The River Yox is artificially managed at Minsmere Sluice [412] and therefore the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and study area are located upstream of its tidal limit. The River Fromus is not a tidally influenced watercourse, as the tidal limit is at its confluence with the River Alde, approximately 4km downstream of the study area's northernmost end.
- 9.4.352 A review of the East Suffolk SFRA [413] indicates that tidal flooding has been recorded in the East Suffolk area. However, it is recorded as located in the 'East Suffolk Coastline' area. Due to the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and study area's location upstream of tidal limits for the River Yox and River Fromus, it can be assumed they are not within impacted areas.
- 9.4.353 Therefore, no flood risk is anticipated from this source.

#### *Canal*

- 9.4.354 A review of canal mapping [414] indicates that there are no canals in the vicinity of the proposed CSR to Saxmundham Pipeline study area. Therefore, no flood risk is anticipated from this source.

#### *Historic*

- 9.4.355 The EA's Recorded Flood Outlines [415] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising



records from as early as 1946. The mapping indicates that no previous flood events have been recorded within the proposed CSR to Saxmundham Pipeline study area.

- 9.4.356 The East Suffolk SFRA [416] details historic flood incidents that have happened within the district. The SFRA does not report any incidents of historic flooding associated with the River Yox or River Fromus. In addition to this, its recorded flood incidents of other sources are recorded to be in locations not in the vicinity of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area or study area.

## Proposed Saxmundham to SZC Pipeline

### Statutory Designations

- 9.4.357 The following international sites are located within the proposed Saxmundham to SZC Pipeline study area:
- Minsmere to Walberswick Heaths & Marshes SAC.
  - Minsmere-Walberswick SPA.
  - Minsmere-Walberswick Ramsar.
- 9.4.358 The Minsmere to Walberswick Heaths & Marshes SAC is designated for habitats including a mix of marshes, reed beds, and open heathland which supports a wide range of wildlife. The Minsmere-Walberswick SPA and Ramsar site is designated for the overwintering populations of a variety of birds and the mosaic of coastal habitats, respectively [417]. Minsmere-Walberswick Heaths and Marshes SSSI, a national-level designated site, overlaps the SAC for the same qualifying interests.
- 9.4.359 Sizewell Marshes SSSI, a national-level designated site, is located at the furthest east extent of the proposed Saxmundham to SZC Pipeline study area. This site is designated for the rare expanses of lowland, unimproved woodland and wet meadows. These habitats support important invertebrate species and breeding birds [418].
- 9.4.360 GWDTEs will be discussed in the groundwater section below.

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### Surface Water Receptors

- 9.4.361 There are five SMRs located within the proposed Saxmundham to SZC Pipeline study area, comprising the River Fromus, two tributaries of the Hundred River (Thorpeness), a tributary of the Minsmere Old River and Leiston Beck, which flows out into the North Sea [419].
- 9.4.362 There are also four WFD catchments which cover the proposed Saxmundham to SZC Pipeline study area. These are Leiston Beck Water Body (GB105035046271), Minsmere Old River Water Body (GB105035046270), Hundred River Water Body (GB105035046260) [420] and the Fromus Water Body (GB105035045980) [421].
- 9.4.363 The River Fromus originates around Rotten End and flows south, through Kelsale and Saxmundham. To the east of this, are the SMRs which are tributaries of the Hundred River (Thorpeness). One of these originates around Oak Tree Farm and flows south to join the other tributary. The other SMR tributary originates around Boundary Farm, flowing south. These watercourses form the headwaters of the Hundred River [422].
- 9.4.364 East of this, is an ordinary watercourse which is an unnamed tributary of the Old Minsmere River. This watercourse originates around Kiln Grove woodlands and flows east, joining the Old Minsmere River within the Minsmere – Walberswick Heath and Marshes SSSI [423].
- 9.4.365 Further east is the SMR, which is a tributary of the Minsmere Old River. This watercourse originates around Theberton Woods and flows northeast, through Theberton, joining the Minsmere Old River in the Minsmere – Walberswick Heath and Marshes SSSI [424].
- 9.4.366 To the east of this, Leiston Beck flows from Brick Kiln Farm and flows southeast, through the Sizewell Marshes SSSI, eventually entering the North Sea [425].
- 9.4.367 Additionally, the North Sea falls within the proposed Saxmundham to SZC Pipeline study area, which is covered by the WFD Norfolk East coastal

Water Body. This water body is currently classified as having ‘moderate’ ecological status (WFD Cycle 3 Classification), with RNAG including pollution inputs [426].

9.4.368 There are multiple small ponds in the area. These have not been quantified at this scoping stage and instead will be assessed as part of the water environment chapter of the ES.

9.4.369 There are a significant number of ditches within the proposed Saxmundham to SZC Pipeline study area, especially in the areas closest to the coast where there are wetland habitats [427]. These have not been quantified at this scoping stage and instead will be assessed as part of the water environment chapter of the ES.

#### *Surface Water Supply*

9.4.370 There are two surface water abstractions within the proposed Saxmundham to SZC Pipeline study area [428]. Both of these are from Leiston Beck, abstracting water for direct spray irrigation.

#### *Hydromorphology*

9.4.371 Due to the low-lying nature of the coastal floodplain, the watercourses around are slow moving and prone to flooding. Therefore, the floodplain is dominated by artificial linear channels to increase drainage off agricultural land [429].

9.4.372 The River Fromus originates from a series of straight agricultural field drains around Rotten End, before flowing south through Dorley’s Corner, Carlton and Saxmundham. Downstream of Saxmundham, the river meanders southeast with numerous drains and ponds within the floodplain, before ultimately joining the River Alde to the south of Snape [430]. Simpson’s Fromus Nature Reserve, managed by Suffolk Flora Trust, is located north of Kelsale, upstream of the rivers crossing of the A12 [431]. The 27-acre nature reserve encompasses a stretch of the river, and it is designated for its species-rich meadows, ancient woodlands and ponds. Suffolk Flora Trust note that the section of the river which flows through the nature

reserve is winterbourne [432], with the channel being barely visible in the summer months. It was also noted that medieval sources suggest that this channel within this nature reserve was diverted in the 17<sup>th</sup> century to maintain flow to the pools which were used for fish [433].

9.4.373 The River Fromus has direct interaction with the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area, where it flows through Dorley's Corner. North of Dorley's Corner the river flows parallel to the A12 road. At this location, the river is heavily reinforced with steep banks and brick walls and it is not laterally connected to its floodplain [434]. South of Dorley's Corner, the watercourse has a more natural meandering planform. Surrounding land use consists of urban housing developments and agricultural land and there is riparian woodland along the banks of the watercourse [435]. Historical maps show limited change in the planform or surrounding land use of the watercourse, apart from increased urban development in some areas [436].

9.4.374 One SMR, which is an unnamed tributary of the Hundred River (Thorpeness), originates near Boundary Farm, flowing south through the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area. The unnamed tributary from East Green appears to have been modified in the past as it flows through agricultural field drains, displaying a very straight planform and limited natural geomorphological features [437]. Surrounding land use is dominated by arable land, with some sections of the watercourse with very limited riparian vegetation. The channel is culverted multiple times under roads and field tracks [438].

9.4.375 The other SMR which is a tributary of the Hundred River watercourse originates slightly further south around Oak Tree Farm. This watercourse has also been modified in the past. It displays a very straight planform through agricultural field drains [439]. Limited riparian vegetation is presence throughout the watercourse.

9.4.376 Leiston Beck is a low-lying watercourse which flows through the Sizewell Marshes SSSI. It is hydraulically connected to an extensive number of

drains within the floodplain, suggesting the area has been managed and previously modified. The watercourse enters the North Sea via a culvert [440].

### *Surface Water Quality*

- 9.4.377 Leiston Beck Water Body (GB105035046271) [441] is classified as having ‘moderate’ ecological status (WFD Cycle 3 Classification) and being a HMWB. RNAG for this water body are due to pollution from sewage discharges causing issues for phosphate and dissolved oxygen levels. Additionally, physical modifications from land drainage are impacting the hydrological regime and the mitigation measures assessments [442].
- 9.4.378 The WFD Minsmere Old River Water Body (GB105035046270) has been previously discussed in paragraph 9.4.104.
- 9.4.379 The Hundred River Water Body (GB105035046260) [443] is currently in ‘bad’ ecological status (WFD Cycle 3 Classification) and designated as being heavily modified. RNAG for this watercourse is due to pollution from sewage discharges which are impacting dissolved oxygen and phosphate levels. Low flow levels and natural drought are also impacting the dissolved oxygen levels and also fish populations.
- 9.4.380 The Fromus Water Body (GB105035045980) [444] has already been previously discussed in paragraph 9.4.330.

Table 9-21: Summary of the Cycle 3 Classification physico-chemical Data for the WFD Catchments within the Proposed Saxmundham to SZC Pipeline Study Area [445].

|                                                  | Leiston Beck Water Body |          | Hundred River Water Body |          |
|--------------------------------------------------|-------------------------|----------|--------------------------|----------|
|                                                  | 2019                    | 2022     | 2019                     | 2022     |
| <b>Overall Physico-chemical quality elements</b> | Moderate                | Moderate | Moderate                 | Moderate |
| <b>Ammonia (Phys-Chem)</b>                       | Moderate                | Moderate | High                     | High     |

|                         | Leiston Beck Water Body |      | Hundred River Water Body |          |
|-------------------------|-------------------------|------|--------------------------|----------|
|                         | 2019                    | 2022 | 2019                     | 2022     |
| <b>Dissolved Oxygen</b> | Bad                     | Bad  | Bad                      | Bad      |
| <b>Phosphate</b>        | Moderate                | Poor | Moderate                 | Moderate |
| <b>Temperature</b>      | High                    | High | High                     | High     |
| <b>pH</b>               | High                    | High | High                     | High     |

9.4.381 There are multiple EA consented discharge sites within the proposed Saxmundham to SZC Pipeline study area [446]. These are outlined in Table 9-22.

Table 9-22: EA Consented Discharge Points within the proposed Saxmundham to SZC Pipeline Study Area [447].

| Name of Site                   | Permit Number | NGR          | Receiving Water Body            | Type of Outlet |
|--------------------------------|---------------|--------------|---------------------------------|----------------|
| Carlton Meres Holiday Park     | PR4NF816X     | PR4NF816X    | Gull Stream                     | Sewage         |
| Saskiavill                     | EPRJB3740KN   | TM3799765359 | Tributary of River Fromus       | Sewage         |
| 1 & 2 West House Farm Cottages | EPRFB3798WR   | TM4185463795 | Tributary of Hundred River      | Sewage         |
| Land Off Moat Road             | PRENF04303    | TM4290065100 | Tributary of Minsmere Old River | Miscellaneous  |
| SCZ Construction Area          | EPRWB3145KB   | TM4318565510 | Tributary of Minsmere Old River | Trade          |
| SCZ Construction Area          | EPRWB3145KB   | TM4306765886 | Tributary of Minsmere Old River | Trade          |
| SCZ Construction Area          | EPRWB3145KB   | TM4294265845 | Tributary of Minsmere Old River | Trade          |

| Name of Site                                        | Permit Number | NGR          | Receiving Water Body            | Type of Outlet |
|-----------------------------------------------------|---------------|--------------|---------------------------------|----------------|
| SCZ Construction Area                               | EPRWB3145KB   | TM3887167014 | Tributary of Minsmere Old River | Trade          |
| SCZ Construction Area                               | EPRWB3145KB   | TM4296966130 | Tributary of Minsmere Old River | Trade          |
| SCZ Construction Area                               | EPRWB3145KB   | TM4318666460 | Tributary of Minsmere Old River | Trade          |
| SCZ Construction Area                               | EPRWB3145KB   | TM4413765193 | Tributary of Minsmere Old River | Trade          |
| SCZ Construction Area                               | EPRWB3145KB   | TM4412265185 | Tributary of Minsmere Old River | Trade          |
| Theberton House (Barn Conversion)                   | PRELF20769    | TM4456065220 | Into land/infiltration system   | Sewage         |
| Leiston - Main Street #3 Combined Sewer Overflow AW | EPRNB3695AY   | TM4523063300 | Leiston Beck                    | Sewage         |
| Leiston Valley Road Water Recycling Centre AW       | ASENF1122     | TM4524063310 | Leiston Beck                    | Sewage         |
| Sizewell C Construction Site                        | EPRDB3946KP   | TM4637964622 | Leiston Drain                   | Trade          |
| Sizewell C Construction Site                        | EPRDB3946KP   | TM4735564128 | Leiston Drain                   | Trade          |
| Sizewell C Construction Site                        | EPRDB3946KP   | TM4718364952 | Leiston Drain                   | Trade          |

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## Groundwater

9.4.382 According to BGS mapping [448], the superficial deposits underlying the majority of the proposed Saxmundham to SZC Pipeline study area comprise the Lowestoft Formation (Diamicton). Within the proposed Saxmundham to SZC Pipeline study area, additional mapped exposures include:

- Head (clay, silt, sand and gravel).
- Lowestoft Formation (sand and gravel).
- Lowestoft Formation (clay and silt).
- Alluvium (clay, silt, sand and gravel).
- Peat.
- Tidal flat deposits (clay and silt).
- Beach deposits (sand and gravel).
- Sand and gravel of uncertain age and origin (sand and gravel).

9.4.383 The bedrock geology underlying the entire proposed Saxmundham to SZC Pipeline study area comprises the Crag Group (sand) [449].

9.4.384 The majority of the superficial deposits beneath the proposed Saxmundham to SZC Pipeline study area are classified by the EA as a Secondary (undifferentiated) aquifer. Small areas, primarily associated with the Lowestoft Formation (sand and gravel) and Alluvium deposits underlying the River Fromus and the Hundred River, are designated as Secondary A aquifers. Towards the eastern end of the proposed Saxmundham to SZC Pipeline study area, approaching SZC, the tidal flat deposits are classified as an unproductive aquifer [450].

9.4.385 The Crag Group (sand) is designated by the EA as a Principal aquifer [451].

9.4.386 The proposed Saxmundham to SZC Pipeline study area is located within the Waveney and East Suffolk Chalk & Crag WFD groundwater body (GB40501G400600). The WFD groundwater body is classified as having a 'poor' overall status [452]. RNAG are outlined in paragraph 9.4.110.



- 9.4.387 The majority of the proposed Saxmundham to SZC pipeline study area is designated as having medium groundwater vulnerability (Lowestoft Formation- Diamicton) [453]. Towards the eastern extent of the proposed Saxmundham to SZC pipeline study area, approaching SZC and the coastline, groundwater vulnerability varies considerably, with areas classified as medium - high (Lowestoft Formation- Sand and gravel and Alluvium), medium - low (areas with no superficial deposit coverage) and low (peat and tidal flat deposits) [454]. There are no SgZs (groundwater) within the proposed Saxmundham to SZC Pipeline study area.
- 9.4.388 The EA's GWDTE dataset [455] indicates that there are two SSSIs classified as GWDTEs within the proposed Saxmundham to SZC Pipeline study area. These are Minsmere - Walberswick Heaths & Marshes and Sizewell Marshes. Minsmere - Walberswick Heaths & Marshes is also designated as an SAC. These were discussed further in paragraph 9.4.358 and 9.4.359. There may also be wetland habitats with a national non-statutory designation, or no designation present which could constitute GWDTE classification. These will be identified during the next stage of the EIA process in assessment in the water environment chapter of the ES.
- 9.4.389 The EA's SPZ map indicates that the majority of the proposed Saxmundham to SZC Pipeline study area lies within a Zone 3 (Total Catchment) SPZ, except the eastern extent around SZC. The closest SPZ1 and SPZ2 are approximately 2km and 1.9km from the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area, respectively. The proposed Saxmundham to SZC Pipeline study area are both located within an NVZ [456].
- 9.4.390 There are three consented discharges (EPRDB3946KP) within the proposed Saxmundham to SZC Pipeline study area that discharge trade effluent to drains, and which have the potential to infiltrate to ground during low flows. Details of these discharges are presented in Table 9-22.
- 9.4.391 There are two licenced groundwater abstractions within the proposed Saxmundham to SZC Pipeline study area, which could be impacted by the

Proposed Development (Table 9-23). There may be PWSs operating within the study area and this information will be requested from the relevant Local Authority as part of the next steps in the EIA process to inform the water environment chapter of the ES.

Table 9-23: Licenced Groundwater Abstractions within the Proposed Saxmundham to SZC Pipeline Study Area.

| Licence Number  | NGR               | Maximum Annual Quantity (m <sup>3</sup> ) | Maximum Daily Quantity (m <sup>3</sup> ) | Purpose                 |
|-----------------|-------------------|-------------------------------------------|------------------------------------------|-------------------------|
| 7/35/03/*G/0073 | TM 43870<br>65270 | 45,460                                    | 1,091                                    | Spray irrigation-direct |
| 7/35/03/*G/0051 | TM 44500<br>65800 | 24,900                                    | 757                                      | Spray irrigation-direct |

## Flood Risk

### Fluvial

9.4.392 The FMfP [457] indicates that there are significant areas of Flood Zone 3 and Flood Zone 2 in the proposed Saxmundham to SZC Pipeline study area. The Flood Zones are associated with the Minsmere Rivers and the North Sea and are extensive in size. Other areas of Flood Zones are associated with the main rivers present throughout the proposed Saxmundham to SZC Pipeline study area. In the centre of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area, Flood Zones 2 and 3 associated with the Hundred River extend further than the watercourse is mapped, crossing into the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area.

9.4.393 A review of the East Suffolk SFRA [458] indicates that the proposed Saxmundham to SZC Pipeline study area is located within Flood Zone 3b, but the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area is not. Whilst Flood Zone 3b is very close to the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area (north of SZC in the eastern end of the study area), it does not overlap with it. The

extensive area of Flood Zone 3b in the proposed Saxmundham to SZC Pipeline study area is associated with the Minsmere Rivers and the North Sea. Additional areas of Flood Zone 3b are north of Saxmundham in the southwest of the proposed Saxmundham to SZC Pipeline study area, associated with the River Fromus.

- 9.4.394 A review of RoFRS + CC mapping [459] indicates that there would be minor increases in the extent of fluvial floodplains within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and study area, with areas of risk becoming associated with more frequent events.

### Surface Water

- 9.4.395 RoFSW mapping [460] indicates that there are areas of high – low risk across the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and study area.
- 9.4.396 The mapping indicates several overland flow pathways across the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and study area, some of which are likely to be additional unnamed ordinary watercourses and drainage ditches not represented in OS Open River mapping [461]. These flow paths and ditches drain into the River Fromus and Hundred River and their tributaries (respectively), as well as unnamed tributaries of the Minsmere Rivers (respectively).
- 9.4.397 In addition to this, surface water ponding is present throughout the proposed Saxmundham to SZC pipeline section of the EIA Scoping Area, associated with high – low risk. The majority of the ponding is small and isolated. However, there are significant areas of ponding located in the centre of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area associated with high – low risk. The extensive areas of ponding are in proximity to the Hundred River, with parts also within areas of mapped fluvial Flood Zones 2 and 3. Due to this, the extensive areas of ponding may represent fluvial flood risk. However, may also be ponding due to the low elevation of the land either side of the watercourse, which prevents surface water from draining into the watercourse. This ponding is

also extensive in the proposed Saxmundham to SZC Pipeline study area, both to the north and south of the centre of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area.

- 9.4.398 A review of RoFSW + CC mapping [462] indicates that the mapped surface water flood risk will have minor increases in extent, with overland flow paths and areas of ponding having larger areas associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated.

### Groundwater

- 9.4.399 The East Suffolk SFRA [463] uses the BGS Susceptibility to Groundwater Flooding dataset, which classifies most of the proposed Saxmundham to SZC Pipeline study area, including the section of the EIA Scoping Area, as having '*limited potential for groundwater flooding to occur*'. The floodplains of the River Fromus and Hundred River are shown to have potential for groundwater flooding to occur, both at the surface and of property situated below ground level.
- 9.4.400 However, this dataset is only intended to provide an indication of where groundwater might emerge and does not show the likelihood of groundwater flooding occurring. Site-specific groundwater flood risk will be assessed during the next stage of the EIA process in the water environment chapter of the ES.
- 9.4.401 EA Reservoir Flood Risk mapping [464], [465] indicates that the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area is located outside mapped areas of risk, but the study area is located within mapped risk extents for both dry and wet days, with the wet day extent covering a larger portion of the study area. The risk is located in the east of the study area and close to the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area.

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## Other Sources

### *Tidal*

- 9.4.402 The River Fromus is not a tidally influenced watercourse. Therefore, there is no tidal risk anticipated from the River Fromus.
- 9.4.403 Other watercourses in the east of the proposed Saxmundham to SZC Pipeline study area include the Hundred River and Minsmere Rivers (Old and New Cut). These rivers are tidally influenced but artificially managed by the Minsmere Sluice, which forms the tidal limit [466]. As a result, the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and study area are located upstream of these tidal limits and are not directly influenced by regular tidal interactions within these watercourses.
- 9.4.404 A review of the East Suffolk SFRA [467] indicates that tidal flooding has been recorded in the East Suffolk area, with seven tidal events recorded between 1888 and 2007. However, these records are generalised to the East Suffolk coastline and do not provide site-specific detail.
- 9.4.405 While tidal flood events have historically occurred within the wider coastal area, the presence of tidal control structures and the upstream location of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and study area (relative to tidal limits) indicate that the direct tidal flood risk to the study area is low. Any residual risk is likely to be indirect and limited in extent, potentially impacting only the easternmost parts of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and study area under extreme conditions.

### *Canal*

- 9.4.406 A review of canal mapping [468] indicates that there are no canals in the vicinity of the proposed Saxmundham to SZC Pipeline study area. Therefore, no flood risk is anticipated from this source.

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### *Historic*

- 9.4.407 The EA's Recorded Flood Outlines [469] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising records from as early as 1946. The mapping indicates that previous flood events have been recorded within the study area. In the east of the proposed Saxmundham to SZC Pipeline study area, a large coastal flood event has been recorded from 1953. The recorded event extent is in the east of the proposed Saxmundham to SZC Pipeline study area and is large in extent. However, it has very minimal interaction with the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area's southeastern most boundary.
- 9.4.408 The East Suffolk SFRA [470] details historic flood incidents that have occurred within the district. The SFRA has recorded flood incidents in the East Suffolk area from 1888 to 2015. Within the vicinity of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and study area, fluvial, tidal, coastal combined tidal and fluvial, and combined fluvial and surface water flood events have been recorded. The fluvial events in 1979 and 1981 are associated with the Hundred River (amongst other watercourses that are not in the vicinity of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area or study area). Outside of these events, the flood events' locations have been described as the 'East Suffolk Coastline' and do not offer specific locations. In addition to this, its recorded flood incidents of other sources are recorded in locations not in the vicinity of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area or study area.

## **Proposed Eastern Distribution Mains**

### **Statutory Designations**

- 9.4.409 The proposed Eastern Distribution Mains study area overlaps with the proposed WSR study area. Therefore, any designated sites or surface water receptors which were mentioned in relation to the proposed WSR section of the EIA Scoping Area (refer to paragraph 9.4.131) will also apply

to this study area and will not be repeated for this section of the EIA Scoping Area. There are no additional internationally or nationally designated sites within the proposed Eastern Distribution Mains study area [471].

9.4.410 GWDEs are discussed in the groundwater section below.

#### **Surface Water Receptors**

9.4.411 There are no further SMRs within the proposed Eastern Distribution Mains study area, additional to any previously mentioned in relation to the proposed WSR section of the EIA Scoping Area (refer to paragraph 9.4.131). However, there is an additional tributary of the River Dove which forms near Mellis and flows east through Yaxley and joining the River Dove near Eye. This watercourse is designated under the WFD as Dove trib – Eye Water Body (GB105034045670) [472].

#### **Surface Water Supply**

9.4.412 There are no additional surface water abstractions in addition to any previously identified within the proposed WSR section of the EIA Scoping Area. This is due to its study area overlapping with the proposed Eastern Distribution Mains study area.

#### **Hydromorphology**

9.4.413 The unnamed tributary of the River Dove within the proposed Eastern Distribution Mains study area appears to be a modified watercourse with a straight planform around arable fields and flowing parallel to roads in places. Near Yaxley Hall Lane, the watercourse is aligned in a right angle around a field, with a pond close to the channel (TM 12246 73641) [473]. It is possible that this pond has formed due to this being the original course of the river. However, the watercourse planform appears unchanged compared to historical maps (1884), except the pond is not featured [474]. The other difference in the surrounding area compared with these maps is that the A140 road did not exist, which may be the reasons for geomorphological changes in the area. Once the watercourse reaches

Yaxley, it flows through an urban area, being culverted beneath multiple roads. Wider land use is dominantly arable with some areas of neutral grassland [475].

- 9.4.414 Numerous small ponds, linear drains and moat features are present within the proposed Eastern Distribution Mains study area, particularly in the vicinity of residential properties within Mellis [476]. These features are typically associated with historic land use and settlements in Suffolk, where moats around properties were common. Many of these features will be artificially reinforced or maintained by dredging. Wider land use in these areas is mainly neutral grasslands [477].

#### *Surface Water Quality*

- 9.4.415 Dove trib – Eye Water Body has been classified as having a ‘moderate’ ecological status (WFD Cycle 3 Classification) [478] and the watercourse is not designated as artificial or heavily modified. The RNAGs were due to groundwater abstraction from the water industry impacting flow levels, in turn this is impacting the dissolved oxygen and hydrological regime. Additionally, pollution from agriculture is impacting invertebrate populations and dissolved oxygen.
- 9.4.416 WFD Cycle 3 classification data provide an insight into the water quality of the catchments within the study area for the proposed Eastern Distribution Mains. These data are summarised in Table 9-24.

Table 9-24: Summary of the WFD Physico-chemical Data for the WFD Catchments within the Proposed Eastern Distribution Mains Study Area (WFD Cycle 3 Classification).

|                                           | Dove trib – Eye Water Body |          |
|-------------------------------------------|----------------------------|----------|
|                                           | 2019                       | 2022     |
| Overall Physico-chemical quality elements | Moderate                   | Moderate |
| Ammonia (Phys-Chem)                       | High                       | High     |
| Dissolved Oxygen                          | Moderate                   | Moderate |
| Phosphate                                 | Good                       | Good     |



|             | Dove trib – Eye Water Body |      |
|-------------|----------------------------|------|
|             | 2019                       | 2022 |
| Temperature | High                       | High |
| pH          | High                       | High |

### *Consented Discharges Sites*

9.4.417 There are multiple EA consented discharge points within the proposed Eastern Distribution Mains study area, in addition to any recorded in the proposed WSR section of the EIA Scoping Area's section of this chapter [479]. These are outlined in Table 9-25.

Table 9-25: Summary of the EA Consented Discharge points within the Proposed Eastern Distribution Mains Study Area [480].

| Name of Site                  | Permit Number | NGR          | Receiving water body    | Type of outlet |
|-------------------------------|---------------|--------------|-------------------------|----------------|
| Eye Airfield Business Park    | EPRLB3895RV   | TM1252574288 | Tributary of River Dove | Trade          |
| Mellis Ps 1 Yaxley Road AW    | AW4NF094      | TM1077374457 | Tributary of River Dove | Sewage         |
| Mellis Ps 2 Earlsford Road AW | AW4NF95       | TM1003273953 | Tributary of River Dove | Sewage         |
| 2 Cow Pasture Barn            | PR4NF1575     | TM0946974062 | Tributary of River Dove | Sewage         |
| 1 Cow Pasture Barn            | PR4NF1576     | TM0945374057 | Tributary of River Dove | Sewage         |
| Kingfisher Barn               | PR4NF1616     | TM0911873935 | Tributary of River Dove | Sewage         |

### *Groundwater*

9.4.418 BGS mapping [481] indicates that the superficial deposits underlying the majority of the proposed Eastern Distribution Mains study area comprise Lowestoft Formation (Diamicton).

9.4.419 Within the proposed Eastern Distribution Mains study area, there are also small exposures of the following superficial deposits:

- Peat.
- Alluvium (clay, silt, sand and gravel).
- Head (clay, silt, sand and gravel).
- Croxton Sand and Gravel Member (sand and gravel).
- Lodge Farm Silt and Clay Member (clay, silt and sand).
- Lowestoft Formation (sand and gravel).

9.4.420 The bedrock geology underlying the entire proposed Eastern Distribution Mains section of the EIA Scoping Area comprises the Crag Group (sand) [482]. The northern extent of the proposed Eastern Distribution Mains study area is underlain by the Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations (undifferentiated) (Chalk).

9.4.421 The Lowestoft Formation (Diamicton), Peat and Head superficial deposits are classified as Secondary (undifferentiated), while the small deposits of Lowestoft Formation (sand and gravel), Alluvium and the Croxton Sand and Gravel Member are designated as Secondary A aquifers [483]. The Lodge Farm Silt and Clay Member is classified as an unproductive aquifer [484].

9.4.422 The Crag Group (sand) and the Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations (undifferentiated) (chalk) are designated as Principal aquifers [485].

9.4.423 The proposed Eastern Distribution Mains study area is located within the Broadland Rivers Chalk and Crag WFD groundwater body (GB40501G400300) [486]. The WFD groundwater body is classified as having a 'poor' overall status. RNAG are outlined in paragraph 9.4.27.

9.4.424 Groundwater vulnerability across the proposed study areas is designated as medium (Lowestoft Formation - Diamicton) or medium - high (Lowestoft Formation - Sand and gravel, Alluvium and Croxton Sand and Gravel Member) [487]. A small area within the proposed Eastern Distribution Mains

study area near to Thrandeston Marsh, where peat is present, is classified as low [488]. There are no SgZs (groundwater) within the proposed study areas.

- 9.4.425 The EA's GWDTE dataset [489] indicates that there is one SSSI classified as a GWDTE within the proposed Eastern Distribution Mains study area. This is Gypsy Camp Meadows, Thrandeston and is discussed further in paragraph 9.4.129. There may also be wetland habitats with a national non-statutory designation, or no designation present which could constitute GWDTE classification. These will be identified during the next stage of the EIA process in the water environment chapter of the ES.
- 9.4.426 The EA's SPZ map indicates that the majority of the proposed Eastern Distribution Mains study area lies within a Zone 3 (Total Catchment) SPZ. The northern extent of the proposed Eastern Distribution Mains study area is not situated within a designated SPZ. The nearest SPZ2 and SPZ1 are located approximately 1.2km and 1.4km east of the proposed Eastern Distribution Mains section of the EIA Scoping Area, respectively. The proposed Eastern Distribution Mains study area is located within an NVZ [490].
- 9.4.427 There are no licenced discharges to ground within the proposed Eastern Distribution Mains study area.
- 9.4.428 There are two licenced groundwater abstractions within the proposed Eastern Distribution Mains study area [491] as shown in Table 9-26. There may also be PWSs operating within the Eastern Distribution Mains study area, and this information will be requested from the relevant Local Authority as part of the next steps in the EIA process to inform the water environment chapter of the ES.

Table 9-26: Licenced Groundwater Abstractions within the Proposed Eastern Distribution Mains Study Area.

| Licence Number  | NGR            | Maximum Annual Quantity (m <sup>3</sup> ) | Maximum Daily Quantity (m <sup>3</sup> ) | Purpose           |
|-----------------|----------------|-------------------------------------------|------------------------------------------|-------------------|
| AN/034/0017/009 | TM 13904 75450 | 68,195                                    | 460                                      | Vegetable washing |
| AN/034/0017/008 | TM 13914 75429 | 15,395                                    | 218                                      | Vegetable washing |

## Flood Risk

### Fluvial

- 9.4.429 The FMfP [492] indicates that there are significant areas of Flood Zone 3 and Flood Zone 2 in the proposed Eastern Distribution Mains study area. The Flood Zones are associated with the River Dove, which flows through the south of the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area, an unnamed tributary of the River Waveney which flows through the northwest of the Eastern Distribution Mains study area.
- 9.4.430 A review of the Mid Suffolk SFRA [493] indicates that the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area are located within Flood Zone 3b, which is associated with the River Dove.
- 9.4.431 A review of RoFRS + CC mapping [494] indicates that there would be minor increases in the extent of fluvial floodplains within the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area, with some areas of risk becoming associated with more frequent events.

### Surface Water

- 9.4.432 RoFSW mapping [495] shows the surface water flood risk associated with high (3.3% (1 in 30) AEP event), medium (1% (1 in 100) AEP event) and low (0.1 (1 in 1000) AEP event) risk events.
- 9.4.433 The mapping indicates that there are areas of high – low risk across the proposed Eastern Distribution Mains section of the EIA Scoping Area and

study area. There is a large surface water flow path in this section of the EIA Scoping Area and study area, which flows from the centre of the study area, through the north of this section of the EIA Scoping Area and the northwest of the study area. The flow path is likely to be representative of risk from an ordinary watercourse not represented in mapping. Additional surface water flow paths are present across this section of the EIA Scoping Area and study area, which correlate with the local topography of the area and drain into nearby watercourses.

9.4.434 There is extensive ponding in the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area, with a significant area in the northwest of the study area, immediately adjacent to the railway line. North of the railway line, the ponding correlates with the Flood Zone mapping. As the flow path connected to this ponding is likely to represent an ordinary watercourse, it is anticipated that the ponding is associated with fluvial flood risk as opposed to surface water. In addition to this, areas of ponding are identified within and around developed areas, including Mid Suffolk Business Park and the residential areas of Mellis, Thrandeston and Yaxley. Due to the ponding's location within urbanised and impermeable areas, it is likely that it is associated with runoff generated by these developments. Additional isolated areas of ponding are likely to reflect local topographical depressions across the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area.

9.4.435 A review of RoFSW + CC mapping [496] indicates that the mapped surface water flood risk will have minor increases in extent, with overland flow paths and areas of ponding having larger areas associated with more frequent events. No significant new areas of ponding or overland flow pathways are anticipated.

### Groundwater

9.4.436 The Mid Suffolk SFRA [497] includes a 1% (1 in 100) AEP Groundwater Flood Map, which shows that there is a largely negligible risk in the proposed Eastern Distribution Mains section of the EIA Scoping Area and

study area. The northwest of the study area is shown to have areas with groundwater levels between 0.5m and 5m, and 0.025m and 0.5m below the ground surface, and within 0.025m of the ground surface, around Thrandeston Marsh, respectively.

- 9.4.437 However, this dataset is only intended to provide a broad scale picture of groundwater flood hazard. Site-specific groundwater flood risk will be assessed during the next stage of the EIA process in the water environment chapter of the ES.

### Reservoir

- 9.4.438 EA Reservoir Flood Risk mapping [498] indicates that the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area are located outside of mapped risk extents for both dry and wet days. As such, no flood risk is anticipated from this source.

### Other Sources

#### *Tidal*

- 9.4.439 The watercourses present within the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area feed into the River Waveney, a watercourse with tidal influence. The tidal limit for the River Waveney is at Ellingham [499], which is located approximately 30km downstream of the proposed Eastern Distribution Mains section of the EIA Scoping Area. As such, no flood risk is anticipated from this source.

#### *Canal*

- 9.4.440 A review of canal mapping [500] indicates that there are no canals in the vicinity of the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area. Therefore, no flood risk is anticipated from this source.

#### *Historic*

- 9.4.441 The EA's Recorded Flood Outlines [501] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising

records from as early as 1946. The mapping indicates that no previous flood events have been recorded within the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area.

- 9.4.442 The Mid Suffolk SFRA [502] provides a map of historic flood incidents that have happened within the district. Between 1888 and 2016, within the vicinity of the proposed Eastern Distribution Mains section of the EIA Scoping Area and study area, there have been historic flood events recorded. The recorded events are in proximity to the A140 carriageway and Eye town. The mapping does not provide further details of the source of flood events. However, the SFRA states that the majority of the historic flood events in the district are from fluvial, surface water or unknown sources.

## Proposed Western Distribution Mains

### Statutory Designations

- 9.4.443 There are no international or nationally designated sites within the proposed Western Distribution Mains study area [503].
- 9.4.444 GWDEs are discussed in the groundwater section below.

### Surface Water Receptors

- 9.4.445 Within the study area for the proposed Western Distribution Mains. There are ordinary watercourses present including the upper reaches of the River Dove. Within the study area, a tributary of the River Dove flows north, joining near Eastlands Lane. This watercourse is designated under the WFD as Dove trib – Finningham Water Body (GB105034045660) [504].
- 9.4.446 There are multiple additional agricultural ditches, drains and ponds within the study area. However, these have not been quantified at this scoping stage and instead will be assessed as part of the water environment chapter of the ES.

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### *Surface Water Supply*

- 9.4.447 There are no surface water abstraction points within the proposed Western Distribution Mains study area.

### *Hydromorphology*

- 9.4.448 Within the proposed Western Distribution Mains study area, there are the upper reaches of the River Dove. This watercourse originates from a combination of agricultural field drains which join together near Westhorpe. The watercourse then flows east, with some drains and ditches within the floodplain [505]. It passes through the urban area of Finningham where it is culverted beneath a few roads and a railway line, displaying a straight planform. Downstream of this location, it starts to display some more natural geomorphological features, with some more meanders evident. LiDAR data suggest that the watercourse has some natural features, showing some potential erosion in areas [506]. There is some occasional riparian tree cover along the watercourse within the study area. However, large sections remain fully encroached by arable land [507].
- 9.4.449 The unnamed tributary originates around the Low Meadow Plantation and flows north to join the River Dove to the north of Westhorpe Road. This watercourse has been modified in the past and flows through arable and neutral grassland, with a straight planform [508].

### *Surface Water Quality*

- 9.4.450 Dove trib – Finningham Water Body has been classified as having a ‘moderate’ ecological status (WFD Cycle 3 Classification) and the watercourse is not designated as artificial or heavily modified [509]. RNAG for this water body are due to pollution from sewage discharges and agricultural sources which are impacting phosphate and dissolved oxygen levels in the catchment.
- 9.4.451 WFD Cycle 3 classification data provide an insight into the water quality of the catchment within the study area for the proposed Western Distribution Mains. These data are summarised in Table 9-27 [510].



Table 9-27: Summary of the WFD Physico-chemical Data for the WFD Catchments within the Proposed Western Distribution Mains Study Area (WFD Cycle 3 Classification) [511].

|                                           | Dove trib – Finningham Water Body |          |
|-------------------------------------------|-----------------------------------|----------|
|                                           | 2019                              | 2022     |
| Overall Physico-chemical quality elements | Moderate                          | Moderate |
| Ammonia (Phys-Chem)                       | High                              | High     |
| Dissolved Oxygen                          | Good                              | Moderate |
| Phosphate                                 | Poor                              | Poor     |
| Temperature                               | High                              | High     |
| pH                                        | High                              | High     |

### *Consented Discharge Sites*

9.4.452 There are multiple EA consented discharge points within the study area [512]. These are outlined in Table 9-28.

Table 9-28: Summary of the EA consented discharge points within the proposed Western Distribution Mains study area [513].

| Name of Site                     | Permit Number | NGR          | Receiving water body           | Type of outlet |
|----------------------------------|---------------|--------------|--------------------------------|----------------|
| The Grove                        | PRENF10250    | TM0730070910 | Tributary of River Dove        | Sewage         |
| Rush Green Cottage               | PRENF20897    | TM0719070890 | Tributary of River Dove        | Sewage         |
| The Cottage next to the Chapel   | EPRXB3394RV   | TM0599870481 | Tributary of River Gipping     | Sewage         |
| Cotton Water Recycling Centre AW | AW4NF513      | TM0717068290 | Fornham Watercourse River Dove | Sewage         |
| Bramlings                        | PRENF08682    | TM0672067740 | Tributary of River Dove        | Sewage         |

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## Groundwater

- 9.4.453 BGS mapping [514] indicates that the superficial deposits underlying the majority of the proposed Western Distribution Mains EIA Scoping Area and study area comprise Lowestoft Formation (Diamicton).
- 9.4.454 Within the proposed Western Distribution Mains study area, there are also small exposures of the following superficial deposits:
- Peat.
  - Alluvium (clay, silt, sand and gravel).
  - Head (clay, silt, sand and gravel).
  - Croxton Sand and Gravel Member (sand and gravel).
  - Lodge Farm Silt and Clay Member (clay, silt and sand).
  - Lowestoft Formation (sand and gravel).
- 9.4.455 The bedrock geology underlying the entirety of the proposed Western Distribution Mains study area comprises the Crag Group (Sand) [515].
- 9.4.456 The Lowestoft Formation (Diamicton), Peat and Head superficial deposits are classified as Secondary (undifferentiated), while the small deposits of Lowestoft Formation (sand and gravel), Alluvium and the Croxton Sand and Gravel Member are designated as Secondary A aquifers [516]. The Lodge Farm Silt and Clay Member is classified as an unproductive aquifer [517].
- 9.4.457 The Crag Group (sand) and the Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations (undifferentiated) (chalk) are designated as Principal aquifers [518].
- 9.4.458 The proposed Western Distribution Mains study area is located within the Broadland Rivers Chalk and Crag WFD groundwater body (GB40501G400300) [519]. The WFD groundwater body is classified as having a 'poor' overall status. RNAG are outlined in paragraph 9.4.27.
- 9.4.459 Groundwater vulnerability across the proposed Western Distribution Mains study area is designated as medium (Lowestoft Formation - Diamicton) or medium - high (Lowestoft Formation - Sand and gravel, Alluvium and

Croxton Sand and Gravel Member) [520]. There are no SgZs (groundwater) within the proposed Western Distribution Mains study area.

9.4.460 There are no nature conservation sites with a statutory national or international designation within the proposed Western Distribution Mains study area. This aligns with the EA's dataset [521] which confirms that there are no SSSIs classified as GWDTEs in the study area. However, it is possible that wetland habitats with a national non-statutory designation, or no designation, are present and which could constitute GWDTE classification. These will be identified through the water features survey which forms part of the next steps in the EIA process to inform the assessment in the water environment chapter of the ES.

9.4.461 The EA's SPZ map indicates that the entire proposed Western Distribution Mains study area lies within a Zone 3 (Total Catchment) SPZ. The proposed Western Distribution Mains study area is located within an NVZ [522].

9.4.462 There are no licenced discharges to ground within the proposed Western Distribution Mains study area.

### **Flood Risk**

#### *Fluvial*

9.4.463 The FMfP [523] indicates that there are significant areas of Flood Zone 3 and Flood Zone 2 in the proposed Western Distribution Mains section of the EIA Scoping Area and study area. The Flood Zones are associated with the River Dove which flows through this section of the EIA Scoping Area and study area.

9.4.464 A review of the Mid Suffolk SFRA [524] indicates that the proposed Western Distribution Mains section of the EIA Scoping Area and study area are located within Flood Zone 3b. Flood Zone 3b is associated with the River Dove.

9.4.465 A review of RoFRS + CC mapping [525] indicates that there would be minor increases in the extent of fluvial floodplains within the proposed Western Distribution Mains section of the EIA Scoping Area and study area, with some areas of risk becoming associated with more frequent events.

### Surface Water

9.4.466 RoFSW mapping [526] shows the surface water flood risk associated with high (3.3% (1 in 30) AEP event), medium (1% (1 in 100) AEP event) and low (0.1% (1 in 1,000) AEP event) risk events.

9.4.467 The mapping indicates that there are areas of high – low risk across the proposed Western Distribution Mains section of the EIA Scoping Area and study area. There are surface water flow paths present within the easternmost and western areas of the study area, respectively. The flow paths follow local topography and drain into the River Dove and its tributaries. In the east, the flow paths are significant and are likely to be representative of risk from an ordinary watercourse not represented in mapping.

9.4.468 In the proposed Western Distribution Mains section of the EIA Scoping Area, there is extensive ponding in the north and northeast (immediately adjacent to the railway line). The ponding is retained by local topography and does not drain towards any existing surface water flow paths or watercourses. In addition to this, areas of ponding are identified within and around the residential area of Finningham. It is likely that it is associated with runoff generated by development due to the ponding's location within urbanised and impermeable areas. Additional ponding is likely to mostly represent drainage ditches around the arable land, as well as areas of small, localised topographical depressions across the proposed Western Distribution Mains section of the EIA Scoping Area and study area.

9.4.469 A review of RoFSW + CC mapping [527] indicates that the mapped surface water flood risk will have minor increases in extent, with overland flow paths and areas of ponding having larger areas associated with more frequent

events. No significant new areas of ponding or overland flow pathways are anticipated.

### Groundwater

- 9.4.470 The Mid Suffolk SFRA [528] includes a 1% (1 in 100) AEP Groundwater Flood Map, which shows that the proposed Western Distribution Mains section of the EIA Scoping Area and study area are largely classified as 'negligible risk'. The centre of the Western Distribution Mains section of the EIA Scoping Area is shown to have areas with groundwater levels between 0.5m and 5m, and 0.025m and 0.5m below the ground surface, and within 0.025m of the ground surface, around Finningham village. There are small areas in the study area with groundwater levels between 0.5m and 5m, and 0.025m and 0.5m, around Gislingham (between 0.025m and 5m) and northwest of Wickham Street (between 0.5m and 5m).
- 9.4.471 However, this dataset is only intended to provide a broad scale picture of groundwater flood hazard. Site-specific groundwater flood risk will be assessed during the next stage of the EIA process in the water environment chapter of the ES.

### Reservoir

- 9.4.472 EA Reservoir Flood Risk mapping [529], [530] indicates that the proposed Western Distribution Mains section of the EIA Scoping Area and study area are located outside of mapped risk extents for both dry and wet days. As such, no flood risk is anticipated from this source.

### Other Sources

#### *Tidal*

- 9.4.473 The watercourses present within the proposed Western Distribution Mains section of the EIA Scoping Area and study area feed into the River Waveney, a watercourse with tidal influence. The tidal limit for the River Waveney is at Ellingham [531], which is located approximately 35km downstream of the proposed Western Distribution Mains section of the EIA Scoping Area. As such, no flood risk is anticipated from this source.

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### *Canal*

- 9.4.474 A review of canal mapping [532] indicates that there are no canals in the vicinity of the proposed Western Distribution Mains section of the EIA Scoping Area and study area. Therefore, no flood risk is anticipated from this source.

### *Historic*

- 9.4.475 The EA's Recorded Flood Outlines [533] presents all EA records of historic flooding from rivers, the sea, groundwater and surface water, utilising records from as early as 1946. The mapping indicates that no previous flood events have been recorded within the proposed Western Distribution Mains section of the EIA Scoping Area and study area.
- 9.4.476 The Mid Suffolk SFRA [534] provides a map of historic flood incidents that have happened within the district. Between 1888 and 2016, within the vicinity of the proposed Western Distribution Mains section of the EIA Scoping Area and study area, there have been historic flood events recorded. The recorded events are in proximity to the B113 carriageway and Finningham village. The mapping does not provide further details of the source of flood events. However, the SFRA states that the majority of the historic flood events in the district are from fluvial, surface water or unknown sources.

## **9.5 Likely Significant Effects**

- 9.5.1 Likely significant effects on the water environment could arise from several direct and indirect sources during the construction, operational and decommissioning phases of the Proposed Development. For any water environment impacts relating to the offshore elements of the LSO component of the Proposed Development, please refer to chapter 8 marine biodiversity of this Scoping Report.

### **Construction Phase**

- 9.5.2 A summary of the potentially significant effects during the Proposed Development's construction phase is outlined in Table 9-29. These impacts

could lead to significant effects in the absence of mitigation. At this scoping stage, as the design of the Proposed Development is still evolving, it is not possible to define the magnitude of impact for the activities upon each receptor. These will be developed in detail in the ES, when the assumptions for the Proposed Development's construction phase are further developed.

Table 9-29: Likely Significant Effects on the Water Environment during the Proposed Development's Construction/Decommissioning Phases

| Sensitive Receptor    | Description of Effect                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surface water quality | Potential for the release of polluting substances from site activities (e.g. operation of machinery, construction activities adjacent to watercourses etc.). This could be caused by fuel leaks, spillages and/or accidental release of construction materials to the ground and/or into adjacent watercourses. Effects on the chemical and biological quality of waters. |
|                       | Construction activities within water body catchments (e.g. operation of machinery, construction activities adjacent to watercourses etc.). This could increase soil erosion and delivery of fine sediment to watercourses, leading to sediment pollution which can impact upon the chemical and biological quality of waters.                                             |
|                       | Drainage and dewatering of construction areas have the potential to change local runoff patterns, change river flow regimes and change the entry point of runoff to water bodies.                                                                                                                                                                                         |
|                       | Construction of watercourse crossings could lead to silty water runoff, accidental releases of pollutants, creation of new pathways for pollutants to reach watercourses.                                                                                                                                                                                                 |
| Surface water supply  | Pollution of a viable water resource through construction activities taking place upstream of a public or private water supply surface water abstraction.                                                                                                                                                                                                                 |
|                       | Construction activities have the potential to lead to temporary severance of a public or private water supply due to disruption of pipelines and other buried assets.                                                                                                                                                                                                     |
| Hydromorphology       | Construction activities adjacent or hydrologically connected to watercourses may lead to an increase in fine sediment delivery via silt-laden runoff. This may lead to a change in sediment and flow dynamics and alter morphological features.                                                                                                                           |
|                       | Discharge of construction drainage to watercourses may lead to changes to flow dynamics and regimes of watercourses.                                                                                                                                                                                                                                                      |



| Sensitive Receptor | Description of Effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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|                    | <p>Increase in impermeable areas (such as hardstanding and compacted soil) within water body catchments, altering drainage networks, potentially altering flow dynamics of watercourses.</p> <p>Removal of marginal or riparian vegetation adjacent to watercourses to facilitate construction has the potential to lead to changes in the structure, composition and stability of river banks.</p> <p>In-channel and/or bankside works, and discharge of construction drainage have the potential to temporarily change to flow and sediment transport dynamics (e.g. in bed and/or bank scour and bed substrate compaction).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Groundwater        | <p>Dewatering could occur as a result of the Proposed Development (from open cut trenching or for construction of below ground structures). Changes to groundwater levels and flows as a result of dewatering or changes to land cover could impact on local abstractions, surface water and habitats that rely on groundwater as well as aquifers.</p> <p>Open-cut trenching could influence groundwater behaviour through the creation of preferential flow pathways, interception of perched horizons, and inflows where groundwater levels lie close to the trench base. Reduced shallow storage during high recharge periods could cause trenches to fill rapidly with groundwater or perched water. Additional construction phase impacts include the potential mobilisation of contaminants.</p> <p>Removing large volumes of freshwater through dewatering could lower the local water table and disrupt the natural pressure balance. This reduction in freshwater head may allow denser seawater to migrate inland and upward into the aquifer system.</p> <p>Potential for the release of polluting substances from site activities. This could be caused by spills or leaks of fuel, spillages and/or release of construction materials to the ground which could migrate to groundwater, entering aquifers, thus affecting groundwater quality. Construction activities could also cause impacts to groundwater quality from the mobilisation of existing contamination sources.</p> <p>The compaction of soils by machinery or creation of temporary construction compounds could change groundwater recharge by altering existing sub-surface flow paths or favouring overland flows. This may impact on surface recharge, levels and flows.</p> |



| Sensitive Receptor | Description of Effect                                                                                                                                                                                                                                                                                                                                       |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | The removal of vegetation to facilitate construction activities and disturbance of ground during construction could cause changes to groundwater quality. This could lead to exposed soils which in turn could lead to greater leaching of natural substances in the soils.                                                                                 |
|                    | Changes to groundwater flow or quality may have indirect impacts on secondary receptors such as groundwater abstractions, surface water or habitats.                                                                                                                                                                                                        |
|                    | Reductions in groundwater levels as a result of dewatering during construction could result in subsidence affecting structures.                                                                                                                                                                                                                             |
| Flood risk         | Construction activities or compounds taking place within floodplains could lead to a loss of floodplain storage. This may displace flood water to other areas downstream.                                                                                                                                                                                   |
|                    | Construction activities have the potential to change flow paths by blocking existing or creating new flow paths. This could lead to reduced channel capacity and an increased flood risk.                                                                                                                                                                   |
|                    | Alterations to, or blockage of culverts and other structures conveying water could result in a temporary loss of capacity resulting in increased flood risk.                                                                                                                                                                                                |
|                    | Placing temporary structures in the channel could affect flood flow conveyance and pose risk of debris accumulating at temporary structures and further reduce channel capacity.                                                                                                                                                                            |
|                    | Haul routes and temporary construction compounds could lead to a temporary increase in impermeable surface which could in-turn lead to increased surface water runoff volume and rate, resulting in an increased risk of flooding.                                                                                                                          |
|                    | If dewatered groundwater is discharged to nearby watercourses the additional inflow will increase channel volumes and may elevate the risk of fluvial or surface water flooding downstream. Conversely, the dewatering activity will lower local groundwater levels, which can temporarily reduce the risk of groundwater flooding in the surrounding area. |

## Operational Phase

- 9.5.3 A summary of the potentially significant effects during the Proposed Development's operational phase is outlined in Table 9-30. These impacts could lead to significant effects in the absence of mitigation. At this scoping stage, as the design of the Proposed Development is still evolving, it is not

possible to define the magnitude of impact for the activities upon each receptor. These will be further developed in detail and assessed in the ES, when the Proposed Development's design has further evolved.

Table 9-30: Likely Significant Effects on the Water Environment during the Proposed Development's Operational Phase

| Sensitive Receptor    | Description of Effect                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surface water quality | Pollution from infrastructure site drainage can arise from a variety of sources. Contaminants deposited on impermeable surfaces are washed off during rainfall events and discharge to the local water environment. New discharges from infrastructure sites, shading by new structures and vegetation, and use of herbicides during operation could cause changes to dissolved oxygen levels and temperature. |
|                       | New or alterations to existing discharges to watercourses could introduce new pollutants and contribute to a deterioration in WFD status of water bodies or jeopardise the WFD objectives of water bodies.                                                                                                                                                                                                     |
|                       | New abstractions could lead to a transfer of pollutants from the source to the pipeline, reducing water quality in affected watercourses in the long-term.                                                                                                                                                                                                                                                     |
|                       | Suspended sediments in runoff from infrastructure sites associated with larger and/or new impermeable areas could lead to sediment pollution in receiving watercourses.                                                                                                                                                                                                                                        |
|                       | Spills or leaks of fuels, or other chemicals used during maintenance work could enter water bodies and affect water quality, in the absence of suitable mitigation measures.                                                                                                                                                                                                                                   |
| Surface water supply  | Permanent severance of a public or private water supply due to disruption of pipelines and other buried assets.                                                                                                                                                                                                                                                                                                |
| Hydromorphology       | Channel realignment due to new or alterations to existing discharge or abstraction infrastructure or watercourse crossings could lead to changes to flow and sediment dynamics, altering channel processes and morphological features.                                                                                                                                                                         |
|                       | Any new or alterations to existing outfall structures could result in loss of riparian vegetation around structures or removal of a length of natural channel bank, thereby potentially altering the composition of the bank.                                                                                                                                                                                  |
|                       | Discharges from new outfalls, and any increases in the discharge/abstraction rate of existing outfalls/abstractions, could cause localised changes in                                                                                                                                                                                                                                                          |

| Sensitive Receptor | Description of Effect                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | flow regime and dynamics potentially altering sediment transport dynamics.                                                                                                                                                                                                                                                                                                                                                                 |
|                    | New crossings have the potential to change the volume and rate of surface water runoff (including riparian drainage) entering a channel, potentially affecting its flow regime and sediment transport dynamics.                                                                                                                                                                                                                            |
|                    | Earthworks at infrastructure sites might result in reduction in lateral connectivity between watercourses and their floodplain.                                                                                                                                                                                                                                                                                                            |
|                    | Changes to flow and sediment dynamics may arise from any potential channel re-alignment.                                                                                                                                                                                                                                                                                                                                                   |
|                    | Washout valve discharges for maintenance could impact flow rate within water bodies, leading to scour at the discharge point or channel bed, potentially altering morphological processes.                                                                                                                                                                                                                                                 |
| Groundwater        | Long-term dewatering could occur as a result of the Proposed Development (for example for below ground structures). Changes to groundwater levels and flows as a result of dewatering or reduced recharge due to changes to land cover could impact underlying aquifers, local abstractions, surface water and ecological receptors such as GWDTEs. Reductions in groundwater levels could also result in subsidence affecting structures. |
|                    | Effects of changes to groundwater flow or quality on primary and secondary receptors such as underlying aquifers, local abstractions, surface water or ecological receptors such as GWDTEs as a result of permanent sub-surface infrastructure. Permanent sub-surface infrastructure could disrupt or block the natural groundwater flow, altering groundwater levels both upslope and downgradient.                                       |
|                    | If the backfill material used in the open-cut trenches differs from the original ground, particularly if the material is more granular, it could form a preferential flow pathway that allows water or pollutants to move more readily into the groundwater system. Conversely, if the backfill is less permeable than the surrounding ground, groundwater could mound upslope and decreased groundwater levels downgradient.              |
|                    | Groundwater quality could be impacted if contaminants can migrate along the pipeline outside or by the mixing of different groundwater chemistries between aquifers due to new preferential flow pathways being introduced as a result of the open cut trenching.                                                                                                                                                                          |

| Sensitive Receptor | Description of Effect                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | Surface runoff from infrastructure sites discharged to groundwater could contain elevated concentrations of pollutants such as oils, suspended solids, metals.                        |
|                    | Spills or leaks of fuels, or other chemicals used during maintenance work could enter aquifers and affect groundwater quality, in the absence of suitable mitigation measures.        |
| Flood risk         | Encroachment into the floodplain by infrastructure may lead to loss of floodplain storage, resulting in increased flood risk.                                                         |
|                    | Any permanent increase in impermeable areas during operation could lead to increased surface water runoff volume and rate, subsequently resulting in an increased risk of flooding.   |
|                    | Development in the floodplain may interrupt surface water and fluvial flow paths, diverting flows and increasing flood risk elsewhere.                                                |
|                    | Washout valve discharges for maintenance as well as long-term dewatering discharges could impact flow rate within water bodies, potentially leading to local increases in flood risk. |
|                    | Discharges from new outfalls, and any increases in the discharge rate of existing outfalls, could cause localised increases in flood risk.                                            |

## Decommissioning Phase

- 9.5.4 It is expected that the likely significant effects identified during the Proposed Development's decommissioning phase will be similar to those described for the construction phase as outlined in Table 9-29. This is because many of the activities for decommissioning will be the same as for construction due to the requirement for decommissioning of infrastructure sites and pipelines requiring similar methodologies (e.g., excavations, dewatering, earthworks, works within and adjacent to watercourses etc.).

## 9.6 Impacts Scoped Out of the Assessment

- 9.6.1 No water environment impacts during the construction, operational and decommissioning phases of the Proposed Development have been proposed to be scoped out of the assessment in the water environment chapter of the ES.

## 9.7 Proposed Approach to Mitigation

- 9.7.1 This section summarises the potential design and mitigation measures that could be applied to eliminate or reduce the Proposed Development's likely significant effects on the water environment.
- 9.7.2 Mitigation measures have been identified to ensure that, where relevant, they directly support compliance with the WFD, including avoidance of deterioration and protection of River Basin Management Plan ('RBMP') objectives. Engagement with all relevant stakeholders will be carried out through the EIA process to ensure mitigation measures are suitable and achievable.

### Primary (Inherent) Mitigation

- 9.7.3 An overview of potential primary mitigation measures that could be applied to the Proposed Development is provided in Table 9-31. As mentioned in paragraph 9.5.4, effects for the decommissioning phase will be similar to those described for the construction phase. Therefore, Table 9-31 does not specifically outline primary mitigation measures for the decommissioning phase.

Table 9-31: Potential Primary (Inherent) Mitigation Measures

| Sensitive Receptor        | Potential Primary (Inherent) Mitigation Measures                                                                                             |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction Phase</b> |                                                                                                                                              |
| Surface Water Quality     | Site selection to avoid (where possible) release of pollutants and suspended sediments into watercourses.                                    |
|                           | Micro-siting and use of trenchless techniques to cross sensitive watercourses.                                                               |
| Surface Water Supply      | Design of the Proposed Development should avoid, wherever possible, construction in areas with known water supply infrastructure or sources. |
| Hydromorphology           | Site selection to avoid (where possible) release of suspended sediments into watercourses.                                                   |
|                           | Avoidance (where possible) of significant alterations to bed and bank material of rivers.                                                    |
|                           | Any temporary outfalls would be designed to mitigate impacts on hydromorphology by being aligned downstream at a 45°                         |

| Sensitive Receptor       | Potential Primary (Inherent) Mitigation Measures                                                                                                                                                                                                                                                                                   |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | angle, submerging the outfall below the water line, if practicable, and setting the outfall back from the bank.                                                                                                                                                                                                                    |
| Groundwater              | Undertaking of ground investigations, including groundwater monitoring and permeability testing, to assess effects of dewatering (where applicable), to inform the project design.                                                                                                                                                 |
|                          | Implementation of low permeability cut-off walls to control groundwater flows and discharges.                                                                                                                                                                                                                                      |
|                          | Avoidance of routes which pass through, or close to, the most sensitive receptors such as GWDTEs and wetlands.                                                                                                                                                                                                                     |
| Flood Risk               | Structures to be designed outside areas of flood risk, where possible. Where this is not possible, clean span structures should be considered to minimise effects as far as practicable.                                                                                                                                           |
| <b>Operational Phase</b> |                                                                                                                                                                                                                                                                                                                                    |
| Surface Water Quality    | The drainage design of the Proposed Development would incorporate mitigation measures to treat and attenuate discharges.                                                                                                                                                                                                           |
|                          | The Proposed Development's drainage design would incorporate mitigation measures to treat and attenuate runoff (such as SuDS features).                                                                                                                                                                                            |
| Surface Water Supply     | The design of the Proposed Development should avoid, wherever possible, areas with known water supply infrastructure or sources.                                                                                                                                                                                                   |
| Hydromorphology          | Any permanent outfalls would be designed to mitigate impacts on hydromorphology by being aligned downstream at a 45° angle, submerging the outfall below the water line, if practicable, and setting the outfall back from the bank.                                                                                               |
|                          | Any channel re-alignments would be appropriately connected to the existing watercourse to reduce the risk of significant channel adjustment and/or bed and bank scour. Any channel re-alignment would avoid having a straight planform.                                                                                            |
|                          | Designing of permanent structures (i.e., abstraction and outfall structures) in line with best practice and Construction Industry Research and Information Association ('CIRIA') guidance including facilitating fish passage and the use of soft-engineering techniques where practicable to mitigate impacts on hydromorphology. |
| Groundwater              | Location of drainage discharge points to ground and groundwater outside of the most sensitive receptors, such as outside of the vicinity of GWDTEs and wetlands.                                                                                                                                                                   |
|                          | Water will be treated prior to discharge to remove potential contaminants.                                                                                                                                                                                                                                                         |

| Sensitive Receptor | Potential Primary (Inherent) Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flood Risk         | Provision of crossings or in-stream structures to maintain existing surface water overland flow paths.                                                                                                                                                                                                                                                                                                                                                                               |
|                    | Drainage to prioritise the use of SuDS, where practicable. Runoff from new or expanded infrastructure sites should be attenuated to ensure no increase in runoff and then discharged in accordance with the drainage hierarchy. As such, in line with the drainage hierarchy, discharge to ground should be sought first. Where this is not practicable, discharge to watercourse then surface water sewer shall be considered. This is to prevent increase in flood risk elsewhere. |

### Secondary (Foreseeable) Mitigation

- 9.7.4 An overview of potential secondary mitigation measures is provided in Table 9-32. As mentioned in paragraph 9.5.4, effects for the decommissioning phase will be similar to those described for the construction phase. Therefore, Table 9-32 does not specifically outline secondary mitigation measures for the decommissioning phase.

Table 9-32: Potential Secondary (Foreseeable) Mitigation Measures

| Sensitive Receptor        | Potential Secondary (Foreseeable) Mitigation Measures                                                                                                                                                                                                         |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction Phase</b> |                                                                                                                                                                                                                                                               |
| Surface Water Quality     | Programme and sequence activities to ensure work within watercourses is undertaken during dry periods of low flow to reduce the risk of scour/erosion mobilising fine sediments around the riverbed and/or structure.                                         |
|                           | Use of measures to control silty water during construction. Measures include the use of temporary lagoons and toe drains at strategic locations along pipeline routes and at infrastructure sites.                                                            |
|                           | Silt fences or silt traps will be used where works occur near a watercourse, where appropriate.                                                                                                                                                               |
|                           | Treatment of discharged water will be required to remove potential contaminants (e.g., silt and chlorine). Adjustments to pH and re-oxygenation are likely to be required to ensure water quality is the same in the discharged water as the receiving water. |
|                           | For trenchless watercourse crossings, launch pits and settlement tanks should be set back an appropriate distance from watercourses. Spoil and residual waste material from                                                                                   |



| Sensitive Receptor   | Potential Secondary (Foreseeable) Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <p>drilling will be disposed of off-site to a permitted waste facility through an appropriately licenced contractor.</p> <p>Implementation of an Outline Construction Environmental Management Plan ('OCEMP') during the construction phase (and an Outline Decommissioning Environmental Management Plan ('ODEMP') during the decommissioning phase). These documents will contain a Surface Water Management Plan ('SWMP').</p> <p>Provision of attenuation storage in the form of sustainable drainage systems ('SuDS') within construction site drainage to restrict runoff and contamination from fine sediments during construction.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Surface Water Supply | <p>Location and mapping of all PWS or public water supply assets and other service infrastructure before construction.</p> <p>Implementation of measures to prevent damage to services and to avoid pollution during service diversions, excavations and ground works.</p> <p>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Hydromorphology      | <p>During any modifications to in-stream structures or other crossings, allowing the watercourse to continue to flow, for example using a flume.</p> <p>Where practicable, avoiding/minimising any in-channel working, including avoidance of key migratory periods for fish; and minimise any removal of riparian and bankside vegetation. Where practicable, re-plant any lost riparian vegetation.</p> <p>Programming of in-channel or bankside working during periods of low flow (typically during summer months) to reduce the risk of mobilising fine sediments and/or disturb the riverbed.</p> <p>Silt fences or silt traps will be used where works occur near a watercourse where appropriate.</p> <p>Land drains temporarily affected during construction will be re-connected/reinstated after construction works are completed.</p> <p>Vehicular crossing of all watercourses will be by temporary open span bridges.</p> <p>For open cut crossings, watercourse banks, channel profile and bed material will be reinstated following construction using natural material and to a condition at least as good as prior to construction. The natural flow of rivers or streams will not be permanently diverted or blocked. Natural flow rates will be maintained at all times using over-pumping or fluming.</p> |



| Sensitive Receptor | Potential Secondary (Foreseeable) Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Groundwater        | <p>Reduction of soil compaction during construction by minimising the number of construction vehicles and the frequency of their passing close to sensitive receptors.</p> <p>Undertaking of the works during the summer or late summer when the water table is at its lowest to reduce the volume of dewatering required.</p> <p>Designation of a sensitive receptor buffer to reduce disruption to any potential GWDTEs or groundwater abstractions.</p> <p>Minimisation of the extent of the works as far as practicable to prevent expansion into sensitive habitats.</p> <p>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Flood Risk         | <p>Provision of temporary drainage such as attenuation within the construction areas (SuDS) restricting runoff to watercourses to greenfield rates and direct to treatment facilities.</p> <p>Location of work areas outside areas at risk of flooding where possible. Where this is not possible, temporary floodplain compensation may be required to offset storage losses.</p> <p>Designing of construction areas to avoid crossing or altering flow routes and, where this is not possible, drainage or suitable attenuation areas should be sought and included in the construction area design; implementation of permeable surfaces in compounds where practicable.</p> <p>Proposed cutting activities, including the excavation of materials and construction of below ground structures have the potential to impact on the local groundwater flood risk. Where dewatering of excavations is undertaken, discharge shall be overland or to a watercourse (with appropriate treatment where necessary) at the relevant greenfield runoff rate.</p> <p>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.</p> <p>Provision of temporary crossings or structures to maintain existing surface water overland flow paths.</p> <p>Construction drainage to prioritise the use of SuDS where practicable. Runoff from construction sites should be attenuated to ensure no increase in runoff and then discharged in accordance with the drainage hierarchy. As such, in line with the drainage hierarchy, discharge to ground should be sought first. Where this is not practicable, discharge to watercourse</p> |

| Sensitive Receptor       | Potential Secondary (Foreseeable) Mitigation Measures                                                                                                                                                                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | then surface water sewer shall be considered. This is to prevent increase in flood risk elsewhere.                                                                                                                                                                                             |
| <b>Operational Phase</b> |                                                                                                                                                                                                                                                                                                |
| Surface Water Quality    | Surface water runoff from new impermeable areas at new or expanded infrastructure sites will be treated and attenuated within the Proposed Development using measures such as petrol interceptors and attenuation ponds.                                                                       |
|                          | Regular water quality monitoring to detect any changes in water quality and take corrective actions.                                                                                                                                                                                           |
|                          | Closed circuit television ('CCTV') inspection of all pipework and chambers periodically.                                                                                                                                                                                                       |
| Hydromorphology          | Post-construction inspections and monitoring of new outfall structures, new in-stream structures and abstraction infrastructure will be undertaken. This will ensure that these are operating as expected and not leading to scour or significant changes to river flow and sediment dynamics. |
| Groundwater              | Planned repair and maintenance will only occur during low flow periods.                                                                                                                                                                                                                        |
| Flood Risk               | Post-construction inspections and monitoring of new outfall structures, new in-stream structures and abstraction infrastructure will be undertaken. This will ensure that these are operating as expected and not leading to increases in flood risk.                                          |

### Tertiary (Inexorable) Mitigation

- 9.7.5 An overview of potential tertiary mitigation measures is provided in Table 9-33. As mentioned in paragraph 9.5.4, effects for the decommissioning phase will be similar to those described for the construction phase. Therefore, Table 9-32 does not specifically outline tertiary mitigation measures for the decommissioning phase. As best practice, guidance and legislation is likely to have changed when decommissioning may take place, tertiary mitigation for the decommissioning phase will adapt and account for this to ensure it is suitable and robust.

Table 9-33: Potential Tertiary (Inexorable) Mitigation Measures

| Sensitive Receptor        | Potential Tertiary (Inexorable) Mitigation Measures                                                                                                                                                                              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction Phase</b> |                                                                                                                                                                                                                                  |
| Surface Water Quality     | Undertaking of work in line with best practice for pollution prevention and relevant code of construction practices.                                                                                                             |
|                           | Preparation of an Incident Response Plan to reduce likelihood of spillages and accidental releases and its implementation, if required.                                                                                          |
|                           | Development, implementation and monitoring of a Sediment Management Plan in accordance with guidance for pollution prevention.                                                                                                   |
|                           | Development of an Emergency Pollution Response Plan in accordance with guidance for pollution prevention and its implementation, if required.                                                                                    |
| Surface Water Supply      | The measures applied for surface water quality and hydromorphology will be suitable to protect surface water supplies during construction.                                                                                       |
| Hydromorphology           | Undertaking of construction activities in line with best practice for pollution prevention and relevant code of construction practices.                                                                                          |
|                           | Preparation of an Incident Response Plan to reduce likelihood of accidental releases of fine sediments and its implementation, if required.                                                                                      |
|                           | Development, implementation and monitoring of a Sediment Management Plan in accordance with guidance for pollution prevention.                                                                                                   |
| Groundwater               | Ensuring compliance with the requirements of the EA's Approach to Groundwater Protection (2018).                                                                                                                                 |
| Flood Risk                | Preparation of an Incident Response Plan to reduce likelihood of flood inundation to construction working areas and its implementation, if required.                                                                             |
|                           | Preparation of a Flood Risk Management Action Plan / Method Statement.                                                                                                                                                           |
| <b>Operational Phase</b>  |                                                                                                                                                                                                                                  |
| Surface Water Quality     | Any washout valve discharges from the pipeline components of the Proposed Development will need to be agreed with regulatory authorities and carried out in accordance with any conditions imposed in regulatory authorisations. |
|                           | Levels of contaminants in any discharge will be within limits likely to be set, and flows will be controlled to levels appropriate to the receiving water.                                                                       |

| Sensitive Receptor   | Potential Tertiary (Inexorable) Mitigation Measures                                                                                                                                                                              |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surface Water Supply | The measures applied for surface water quality and hydromorphology will be suitable to protect surface water supplies during operation.                                                                                          |
| Groundwater          | Any washout valve discharges from the pipeline components of the Proposed Development will need to be agreed with regulatory authorities and carried out in accordance with any conditions imposed in regulatory authorisations. |
|                      | If impacts occur from abstracting groundwater, then use abstracted water to recharge groundwater.                                                                                                                                |
| Flood Risk           | Any washout valve discharges from the pipeline components of the Proposed Development will need to be agreed with regulatory authorities and carried out in accordance with any conditions imposed in regulatory authorisations. |
|                      | Discharge rates should be within agreed levels and not be undertaken in periods of high river flows.                                                                                                                             |

## 9.8 Proposed Approach to the ES

### Best Practice Guidance

9.8.1 The ES will be undertaken with regard to the following best practice guidance documents:

- CIRIA Control of Water Pollution from Linear Construction Projects: Technical Guidance, CIRIA C648 (2006a) [535].
- CIRIA Control of Water Pollution from Linear Construction Projects: Site guide, CIRIA C649 (2006b) [536].
- CIRIA Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (C532) (2010) [537].
- CIRIA The SuDS Manual (C753) (2015) [538].
- EA's Approach to Groundwater Protection (2018) [539].
- National Highways (formerly Highways England) Design Manual for Roads and Bridges ('DMRB') LA 113 – Road Drainage and the Water Environment (2020) [540] (the 'DMRB LA 113 Guidance').
- National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 104 Environmental Assessment and Monitoring (2020) [541].
- National Policy Statement for Water Resources Infrastructure (2023) ('NPSWRI') [542].

- Hydrogeological impact assessment appraisal for groundwater abstractions: Science Report – SC040020/SR2 (2007a) [543].
- Hydrogeological impact appraisal for dewatering abstractions. Science Report – SC040020/SR1 (2007b) [544].
- Surface water pollution risk assessment for your environmental permit (2016) [545].
- Water Framework Directive assessment: estuarine and coastal waters (Clearing the Waters for All) (2016) [546].
- Environmental Quality Standards Directive list for WFD assessments (2016) [547].
- Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems (2004) [548].

9.8.2 It should be noted that the proposed approach to the ES in this chapter will differ from the approach laid out in chapter 3 EIA methodology. This assessment will follow DMRB LA 113 [549] and DMRB LA 104 [550] guidance and terminology from these guidance documents will be applied. This has been done as this is considered industry best practice for assessing the likely significant effects from a project on the water environment. Furthermore, adaptation of the terminology as outlined in chapter 3 EIA methodology may result in scrutiny of the proposed approach. Chapter 3 EIA methodology does make provisions to allow for alternative, discipline-specific methodologies to be adopted where appropriate.

### Assessment Methodology

9.8.3 The assessment will identify the baseline receptors of the water environment within the study area related to the following receptor types:

- Surface water quality.
- Surface water supply.
- Hydromorphology.
- Groundwater.
- Flood risk.

9.8.4 This will include a desk-based assessment using available online resources. Additional information will also be collected, which may include

site inspection where required, and may include (but not be limited to) the following:

- Specific sensitive watercourses (for water quality and flood risk).
- Permitted discharges and sampling points.
- Watercourses designated for their hydromorphology or water quality.
- GWDTEs.
- PWS and public water supplies.

- 9.8.5 The assessment will identify the likely significant effects of the Proposed Development during the construction, operational and decommissioning phases.
- 9.8.6 The assessment will account for the potential impacts on water environment receptors potentially significantly affected. It will consider other environmental topics, such as agricultural land and soils and terrestrial biodiversity, so that groundwater quality aspects relating to land contamination and GWDTEs of relevance are embedded into hydrogeology considerations within the assessment.
- 9.8.7 The assessment will be based on methodologies and criteria developed through professional experience and as used on previous EIAs for proposed developments of a similar nature, size and scale to the Proposed Development, as well as guidance set out in the NPSWRI [551], the DMRB LA 113 [552] Guidance and other best practice guidance.
- 9.8.8 The identification of potentially significant effects on the water environment will be derived from a qualitative assessment of the baseline information reviewed to inform receptor sensitivity and professional judgement, combined with a quantitative assessment of areas of risk (e.g. the number and extent of water bodies and watercourses traversed by the Proposed Development).
- 9.8.9 The impacts and effects from the Proposed Development on the water environment will be characterised and will consider those occurring during the construction, operational and decommissioning phases across the

range of water environment receptors within the study area. Where impacts are identified, details will be provided within the assessment to characterise these in terms of:

- Impact type.
- Extent of impact.
- Duration of impact.
- Timing of impact.
- Frequency of impacts.
- Reversibility of impact.

9.8.10 Other studies will support the overall water environment assessment, including an FRA and WFD Compliance Assessment that will be submitted as part of the water environment chapter of the ES.

### Sensitivity of Receptors

9.8.11 The criteria used to determine the value and sensitivity of receptors identified from a desk-based assessment and survey information will be based on importance, rarity, and attributes/processes. The sensitivity (defined as 'importance' in the DMRB LA 113 Guidance) of each water receptor will be assessed based on the criteria set out in Table 9-34. These criteria may be subject to change in response to ongoing design development and consultation feedback from stakeholders. Further to this, it should be noted that the criteria in this chapter differs from chapter 3 EIA methodology for the reasons described in paragraph 9.8.2.

Table 9-34: Sensitivity of Water Environment Receptors Criteria

| Sensitivity | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very High   | <b>Nationally significant attribute of high importance</b>                                                                                                                                                                                                                                                                                                                                                   |
|             | <b>Surface water quality:</b> WFD Regulations classified water body achieving 'High' physico-chemical and biological elements status, 'Pass' for specific pollutants and/or priority substances. Watercourse part of a site protected/designated under UK legislation (i.e. SACs, SPAs, SSSIs, and Ramsar sites). Non-WFD Regulations classified watercourses may be applicable if part of a protected site. |



| Sensitivity | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <p><b>Surface water supply:</b> Water resource extensively exploited for public, private, domestic and/or agricultural and/or industrial use, feeding 10 or more properties.</p> <p><b>Hydromorphology:</b> WFD Regulations classified water body achieving 'High' morphology status. Non-WFD Regulations classified watercourses may be applicable if they demonstrate qualities such as a channel in stable equilibrium and exhibiting a range of natural morphological features (such as pools, riffles and bars); diversity in morphological processes reflects unconstrained natural function; free from artificial modification or anthropogenic influence.</p> <p><b>Groundwater:</b> Principal bedrock and superficial aquifers. Groundwater flow and yield associated with licensed groundwater abstractions. Groundwater quality associated with SPZ 1 (Inner Protection Zone) associated with licensed abstractions.</p> <p>Buildings of regional or national importance, such as Grade I and II* listed buildings, scheduled monuments, hospitals, power stations and large industrial sites.</p> <p>Water feeding GWDTEs with a high or moderate groundwater dependence with a high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs.</p> <p><b>Flood risk:</b> Highly vulnerable development and Essential Infrastructure [553] at risk of flooding during the 1% (1 in 100) AEP) event plus allowance for climate change.</p> |
| High        | <p><b>Locally significant attribute of high importance</b></p> <p><b>Surface water quality:</b> WFD Regulations classified water body achieving or having established RBMP objectives (for a later RBMP cycle) to achieve 'good' physico-chemical and biological elements status ('good potential' for HMWBs), 'Pass' for specific pollutants and/or priority substances. Species protected under UK legislation ecology and nature Conservation are present but is not part of a protected site. Non-WFD Regulations classified water bodies may be applicable if protected species are present, indicating good water quality and supporting habitat.</p> <p><b>Surface water supply:</b> Valuable water supply resource due to exploitation for public, private, domestic and/or agricultural and/or industrial use, feeding fewer than 10 properties.</p> <p><b>Hydromorphology:</b> WFD Regulations classified water body achieving or having established RBMP objectives (for a later RBMP cycle) to achieve 'good' morphology status. Non-WFD Regulations classified watercourses may be applicable if they demonstrate qualities such as a channel achieving near-stable</p>                                                                                                                                                                                                                                                                                                                 |



| Sensitivity | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <p>equilibrium and exhibiting a range of natural morphological features (such as pools, riffles and bars); diversity in morphological processes reflects relatively unconstrained natural function, with minor artificial modification or anthropogenic influence.</p> <p><b>Groundwater:</b> Secondary A aquifers. Groundwater flow and yield and quality associated with extensive non-licensed private water abstractions (i.e. feeding 10 or more properties or supplying large farming/animal estates). Groundwater quality associated with SPZ2 (Outer Protection Zone) associated with licensed abstractions.</p> <p>Residential and commercial properties and Grade II listed buildings.</p> <p>Water feeding GWDTEs of low groundwater dependence with a high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs; or water feeding highly or moderately GWDTE with a national non-statutory UK Biodiversity Action Plan ('BAP') priority.</p> <p><b>Flood risk:</b> More vulnerable development [553] at risk of flooding during the 1% (1 in 100) AEP event plus allowance for climate change or at risk from the emergence of groundwater at the surface.</p>    |
| Medium      | <p><b>Of moderate quality and rarity</b></p> <p><b>Surface water quality:</b> Water body not classified under WFD Regulations. May have a number of anthropogenic pressures and/or pollutant inputs from discharges and/or surrounding land-use relative to flow volume.</p> <p><b>Surface water supply:</b> Not applicable as all water supplies are always either assigned Very High or High importance.</p> <p><b>Hydromorphology:</b> Water body not classified under WFD Regulations. A channel currently showing signs of historical or existing modification and artificial constraints attempting to recover to a natural equilibrium and exhibiting a limited range of natural morphological features (such as pools, riffles and bars).</p> <p><b>Groundwater:</b> Secondary B and Secondary Undifferentiated aquifers. Groundwater flow and yield and quality associated with small scale private water abstractions (i.e. feeding fewer than 10 properties). Groundwater quality associated with SPZ3 (Source Catchment Protection Zone) associated with licensed abstractions and with licensed abstractions for which no SPZ is defined.</p> <p>Unoccupied residential and commercial properties and buildings.</p> |

| Sensitivity | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <p>Water feeding GWDTEs of low groundwater dependence with a national non-statutory UK BAP priority; or water feeding highly or moderately groundwater-dependent GWDTE sites with no conservation designation.</p> <p><b>Flood risk:</b> Less vulnerable development [553] at risk of flooding during the 1% (1 in 100) AEP event plus allowance for climate change or with potential for groundwater flooding at the surface.</p> <p>Or, highly vulnerable development, essential infrastructure or more vulnerable development at risk of flooding during the 0.1% (1 in 1,000) AEP flood event.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Low         | <p><b>Lower quality</b></p> <p><b>Surface water quality:</b> Water body not having a WFD Regulations classification shown in a RBMP. May have many anthropogenic pressures and/or pollutant inputs from licensed discharges and/or surrounding land-use relative to flow volume.</p> <p><b>Surface water supply:</b> Not applicable as all water supplies are always either assigned Very High or High importance.</p> <p><b>Hydromorphology:</b> Water body not classified under WFD Regulations. A channel currently showing signs of extensive historical or existing modification and artificial constraints. There is no evidence of diverse fluvial processes and morphology and active recovery to a natural equilibrium.</p> <p><b>Groundwater:</b> Very poor groundwater quality and / or very low permeability make exploitation of groundwater unfeasible. No active groundwater supply.</p> <p>Industrial buildings that are currently not utilised, all derelict buildings and infrastructure that serves a single dwelling.</p> <p>Water feeding GWDTEs of low groundwater dependence with no designation or groundwater that supports a wetland not classified as a GWDTE, although may receive some minor contribution from groundwater.</p> <p><b>Flood risk:</b> Water-compatible development at risk of flooding during the 1% (1 in 100) AEP event plus allowance for climate change.</p> <p>Or less vulnerable development at risk of flooding during the 0.1% (1 in 1,000) AEP flood event.</p> |

## Impact Magnitude

9.8.12 The criteria used to determine the magnitude of impact on the water environment is based on the DMRB LA 113 Guidance and professional

judgement. The magnitude of impact will be assessed based on the criteria set out in Table 9-35. These criteria may be subject to change in response to ongoing design development and consultation feedback from stakeholders. Further to this, it should be noted that the criteria in this chapter differs from chapter 3 EIA methodology for the reasons described in paragraph 9.8.2.

Table 9-35: Impact Magnitude Criteria for Water Environment Receptors

| Magnitude     | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Major adverse | <p><b>Results in loss of attribute and/or quality and integrity of the attribute</b></p> <p><b>Surface water quality:</b> Construction works in-channel and/or extensive construction works adjacent to a watercourse which are therefore likely to risk a major, measurable shift from baseline water quality. Risk of adverse impacts on protected aquatic species. Construction works on multiple tributaries of a watercourse resulting in the risk of significant cumulative impacts on water quality. Loss or extensive change to a designated nature conservation site. For WFD Regulations classified water bodies, water quality impacts have the potential to cause deterioration/reduction in WFD Regulations status/classification.</p> <p><b>Surface water supply:</b> Long-term loss or change to water supply.</p> <p><b>Hydromorphology:</b> Loss of, or extensive adverse changes to the watercourse bed, banks and vegetated riparian corridor resulting in changes to existing morphological features and/or channel planform and cross section and/or natural fluvial processes. Impacts would be at the water body scale. For WFD Regulations classified water bodies, impacts have the potential to cause deterioration on morphology status or prevent the achievement of 'good' morphology status due to an increase in the extent of morphological pressures on the water body.</p> <p><b>Groundwater:</b> Major or irreversible change to groundwater aquifer(s) flow, water level, quality or available yield which endangers the resources currently available. Groundwater resource use / abstraction is irreparably impacted upon, with a major or total loss of an existing supply or supplies. Changes to water table level or quality would result in a major or total change in, or loss of, a groundwater dependent area, where the value of a site would be severely affected. Changes to groundwater aquifer(s) flow, water level and quality would result in major changes to groundwater baseflow contributions</p> |

| Magnitude        | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <p>to surface water and / or alterations in surface water quality, resulting in a major shift away from baseline conditions such as change to WFD status. Dewatering effects create significant differential settlement effects on existing infrastructure and buildings leading to extensive repairs required.</p> <p><b>Flood risk:</b> A large adverse change in flood depth (&gt;100mm), flood extent, velocity or peak flow that may have an impact some distance upstream or downstream. Potential to significantly change flood frequency. Potential change in risk to life.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Moderate adverse | <p><b>Results in effect on integrity of attribute, or loss of part of attribute</b></p> <p><b>Surface water quality:</b> Construction works adjacent to a watercourse which are therefore likely to risk a moderate, measurable shift away from baseline water quality. Partial loss in productivity of a fishery. For WFD Regulations classified water bodies, water quality impacts may contribute to, but not cause a reduction in water body WFD Regulations classification.</p> <p><b>Surface water supply:</b> Temporary disruption or deterioration in a water supply.</p> <p><b>Hydromorphology:</b> Adverse changes to the water feature bed, banks and vegetated riparian corridor resulting in changes to existing morphological features and/or channel planform and cross section and/or natural fluvial processes. Impacts would be at the reach scale [554]. For WFD Regulations classified water bodies, impacts may increase the extent of morphological pressures. May contribute to, but not cause, a deterioration of morphology status.</p> <p><b>Groundwater:</b> Moderate long term or temporary significant changes to groundwater aquifer(s) flow, water level, quality or available yield which results in moderate long term or temporarily significant decrease in resource availability. Groundwater resource use/abstraction is impacted slightly, but existing supplies remain sustainable. Changes to water table level or groundwater quality would result in partial change in or loss of a groundwater dependent area, where the value of the site would be affected, but not to a major degree. Changes to groundwater aquifer(s) flow, water level and quality would result in moderate changes to groundwater baseflow contributions to surface water and / or alterations in surface water quality, resulting in a moderate shift from baseline conditions upon which the WFD status rests. Dewatering effects create moderate differential settlement effects on existing infrastructure and buildings leading to consideration of undertaking minor repairs.</p> |

| Magnitude     | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | <p><b>Flood risk:</b> A moderate adverse change in flood depth (&gt;50mm), flood extent or peak flow that may have limited impact some distance upstream or downstream. Potential for some change in flood frequency. Minor changes in floodplain flow pathways that increase velocity or extent of flooding but do not lead to new areas being inundated or new flow pathways forming.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Minor adverse | <p><b>Results in some measurable change in attributes, quality, or vulnerable</b></p> <p><b>Surface water quality:</b> Construction works within the watercourse catchment that may result in a risk of a minor, measurable shift from baseline water quality.</p> <p><b>Surface water supply:</b> Not applicable as (negative) impacts to water supplies are only ever considered to have major or moderate adverse effects.</p> <p><b>Hydromorphology:</b> Slight adverse changes to/impacts on the water feature bed, banks and vegetated riparian corridor resulting in changes to existing morphological features and/or channel planform and cross section and/or natural fluvial processes. Impacts would be at the local scale. For WFD Regulations classified water bodies, impacts may result in a slight increase the extent of morphological pressures or occur where there are existing morphological pressures. Morphology status unaffected.</p> <p><b>Groundwater:</b> Minor changes to groundwater aquifer(s) flow, water level, quality or available yield leading to a noticeable change, confined largely to the Proposed Development's area. Changes to water table level, groundwater quality and yield result in little discernible change to existing resource use. Changes to water table level or groundwater quality would result in minor change to groundwater dependent areas, but where the value of the site would not be affected. Changes to groundwater aquifer(s) flow, water level and quality would result in minor changes to groundwater baseflow contributions to surface water and/or alterations in surface water quality, resulting in a minor shift from baseline conditions (equivalent to minor but measurable change within WFD status). Dewatering effects create minor differential settlement effects on existing infrastructure and buildings which may need to be monitored but where repairs may be avoidable.</p> <p><b>Flood risk:</b> A small or very localised adverse change in flood depth (&gt;10mm), extent or peak flow with no perceptible impact upstream or downstream or in the floodplain. Minor changes in flood frequency.</p> |

| Magnitude           | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Negligible          | <p><b>Results in effect on attribute, but of insufficient magnitude to affect the use or integrity</b></p> <p><b>Surface water quality:</b> Construction works within the watercourse catchment that are not anticipated to result in a risk of a change in water quality.</p> <p><b>Surface water supply:</b> Not applicable as (negative) impacts to water supplies are only ever considered to have major or moderate adverse effects.</p> <p><b>Hydromorphology:</b> Minimal or no measurable change from baseline conditions in terms of sediment transport, channel morphology and natural fluvial processes. Any impacts are likely to be highly localised.</p> <p><b>Groundwater:</b> Very slight change from groundwater baseline conditions approximating to a 'no change' situation. Dewatering effects create no or no noticeable differential settlement effects on existing infrastructure and buildings.</p> <p><b>Flood risk:</b> Very limited potential for change. Flood level increase within model tolerances (+/- 10mm). No change in flood frequency.</p>                                                                                                       |
| Minor beneficial    | <p><b>Results in some beneficial effect on attribute or a reduced risk of negative effect occurring</b></p> <p><b>Surface water quality:</b> Construction works within the watercourse catchment that may result in a risk of a minor beneficial, measurable shift from baseline water quality.</p> <p><b>Surface water supply:</b> Not applicable as (negative) impacts to water supplies are only ever considered to have major or moderate adverse effects.</p> <p><b>Hydromorphology:</b> Slight beneficial changes to/impacts on the water feature bed, banks and vegetated riparian corridor resulting in changes to existing morphological features and/or channel planform and cross section and/or natural fluvial processes. Benefits would be at the local scale. For WFD Regulations classified water bodies, impacts may result in a slight decrease the extent of morphological pressures. Morphology status unaffected.</p> <p><b>Groundwater:</b> Reduction of groundwater hazards to existing structures. Reductions in waterlogging and groundwater flooding.</p> <p><b>Flood risk:</b> Creation of flood storage and decrease in peak flood level (&gt; 10mm).</p> |
| Moderate beneficial | <p><b>Results in moderate improvement of attribute quality</b></p> <p><b>Surface water quality:</b> Improvements in water quality resulting in a moderate, measurable improvement in baseline water quality. For WFD Regulations classified water bodies,</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



| Magnitude        | Applicable Project Examples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <p>water quality impacts may contribute to, but not cause an improvement in water body WFD Regulations classification.</p> <p><b>Surface water supply:</b> Temporary enhancement to a water supply.</p> <p><b>Hydromorphology:</b> Beneficial changes to the water feature bed, banks and vegetated riparian corridor resulting in improvement to existing morphological features and/or channel planform and cross section and/or natural fluvial processes. Improvements would be at the reach scale [554]. For WFD Regulations classified water bodies, impacts may decrease the extent of morphological pressures. May contribute to, but not cause, an improvement of morphology status.</p> <p><b>Groundwater:</b> Contribution to improvement in water body WFD classification. Improvement in water body catchment abstraction management strategy (or equivalent) classification. Support to significant improvements in damaged GWDTE.</p> <p><b>Flood risk:</b> Creation of flood storage and decrease in peak flood level (&gt;50mm).</p>                                                    |
| Major beneficial | <p><b>Results in major improvement of attribute quality</b></p> <p><b>Surface water quality:</b> Removal of existing polluting discharge or removing the likelihood of polluting discharges occurring to a watercourse. Improvement in water body WFD classification.</p> <p><b>Surface water supply:</b> Long-term enhancement of water supply.</p> <p><b>Hydromorphology:</b> Extensive improvement to the watercourse bed, banks and vegetated riparian corridor resulting in improvement to existing morphological features and/or channel planform and cross section and/or natural fluvial processes. Impacts would be at the water body scale. For WFD Regulations classified water bodies, impacts have the potential to cause and improvement in morphology status.</p> <p><b>Groundwater:</b> Removal of existing polluting discharge to an aquifer or removing the likelihood of polluting discharges occurring. Recharge of an aquifer. Improvement in water body WFD classification.</p> <p><b>Flood risk:</b> Creation of flood storage and decrease in peak flood level (&gt; 100mm).</p> |
| No change        | <p>No loss or alteration of characteristics, features or elements; no observable impact (for adverse or beneficial impacts).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Effect Significance

- 9.8.13 The significance of an effect is based on the combination of the sensitivity of the receptor and the magnitude of impact and will be assessed using the matrix in Table 9-36. This table is based on Table 3.8.1 in DMRB LA 104 [555] guidance. Effects which are deemed to be moderate or greater are considered to be significant effects in the context of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [556] and The Marine Works (Environmental Impact Assessment) Regulations 2007 (amended in 2017) [557], [558]. Where options are presented in Table 9-36 as to the outcome of the assessment, professional judgement will be used to select a single outcome.
- 9.8.14 An effect assessed to be moderate or greater (displayed in bold in Table 9-36) will be regarded as significant.
- 9.8.15 It should be noted that the criteria in this chapter differs from chapter 3 EIA methodology for the reasons described in paragraph 9.8.2.

Table 9-36: Matrix to Assess Significance of Effects

|                         |           | Magnitude of Impact |                   |                           |                            |                            |
|-------------------------|-----------|---------------------|-------------------|---------------------------|----------------------------|----------------------------|
|                         |           | No change           | Negligible        | Minor                     | Moderate                   | Major                      |
| Sensitivity of Receptor | Very high | Neutral             | Slight            | <b>Moderate or Large</b>  | <b>Large or Very Large</b> | <b>Very Large</b>          |
|                         | High      | Neutral             | Slight            | <b>Slight or Moderate</b> | <b>Moderate or Large</b>   | <b>Large or Very Large</b> |
|                         | Medium    | Neutral             | Neutral or Slight | Slight                    | <b>Moderate</b>            | <b>Moderate or Large</b>   |
|                         | Low       | Neutral             | Neutral or Slight | Neutral or Slight         | Slight                     | <b>Slight or Moderate</b>  |

## Mitigation and Residual Effects

- 9.8.16 The water environment chapter of the ES will assess effects both before and after the implementation of mitigation measures, distinguishing between primary, secondary and tertiary mitigation measures. Where secondary mitigation is required to reduce effects to acceptable levels, this



will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES. Further details are provided in chapter 3 EIA methodology.

### In-combination Effects

9.8.17 In-combination effects are those that result from the interaction between the individual effects of the Proposed Development, combined together on a single receptor at a single point in time. Depending on the interrelationship between the individual effects these may combine to result in a likely significant effect, even where the individual effects were not significant. The potential in-combination effects in relation to the water environment will be assessed within the water environment chapter of the ES.

9.8.18 Potential in-combination effects for the water environment include:

- Potential impacts on aquatic habitats and ecosystems (chapter 7 freshwater biodiversity of this Scoping Report).
  - Changes to surface and groundwater levels and flows.
  - Direct disturbance of surface water bodies (e.g., crossing by pipeline, abstraction or discharge).
  - Increased sediment supply to surface water bodies.
- Potential impacts on marine habitats and ecosystems (chapter 8 marine biodiversity of this Scoping Report).
  - Changes to marine water quality associated with the construction, operation or decommissioning of the LSO component of the Proposed Development or alterations to existing discharges.
- Potential impacts on archaeology or heritage assets (chapter 11 terrestrial historic environment of this Scoping Report).
  - Changes to surface and groundwater flows may lead to damage of buried archaeology and subsidence of above ground heritage features.
- Potential impacts of climate change (chapter 16 climate change of this Scoping Report).
  - Increases in flood risk.
  - Changes to land drainage.
  - Changes to surface water and groundwater flows.
- Potential impacts on human health (chapter 18 human health of this Scoping Report).

- Increased risk of flooding to homes, businesses and other assets.
  - Potential impacts of contaminants (chapter 19 ground conditions and chapter 20 agricultural land and soils of this Scoping Report).
    - Increased sediment supply to surface water bodies.
    - Changes to groundwater levels and flows.
- 9.8.19 As set out in chapter 3 EIA methodology of this Scoping Report, cumulative effects with other existing and, or approved development' (inter-project effects), will be assessed within the cumulative effects assessment chapter of the ES.
- 9.8.20 A separate in-combination assessment in relation to international sites will also be set out within a separate Habitats Regulations Assessment for the Proposed Development.

### Limitations and Assumptions

- 9.8.21 The following assumptions have been made:
- The baseline conditions presented in this chapter of the Scoping Report have been derived from desk-based sources. The next phase of assessment would include field studies to provide more information on the baseline conditions as well as validate the desk-based studies.
  - At the time of writing, some baseline data are not available. Therefore, it is likely to be necessary to update the baseline assessments in the ES when this information is available. It is expected that there will be sufficient data to undertake a robust assessment in the ES, although some assumptions may need to be made due to uncertainty. Where this is the case, any assumptions will be clearly set out.
  - The assessment will adopt a '*cautious worst case*' approach in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects: Pre-Application Advice on Environmental Impact Assessment [559] and will be based on inputs from desk-based or field assessments.
  - It is acknowledged that uncertainty is inherent to the assessment of interaction between surface water and groundwater. However, the collected data will enhance the understanding of assessment conditions in current and future baseline assessment scenarios.
  - The proposed study area comprising the EIA Scoping Area plus a 1km radius is sufficient at this scoping stage for the purposes of the assessment for surface water quality, surface water supply, hydromorphology, groundwater and flood risk elements.

- Additional land take required for any water quality treatment features in order to achieve the required water quality standards will be accounted for in the Order Limits.
- The consideration of changes in flow regime, hydromorphological conditions, flood risk and water quality are considered in general terms within this chapter of the Scoping Report and impacts are applied across various surface water receptors across the study area. The ES will include considerations specifically for the changes arising as a result of the Proposed Development from the new proposed discharge into the River Waveney and any proposed alterations to the abstraction volumes/rates of the existing Barsham WTW abstraction point near Shipmeadow.

9.8.22 The main limitations comprise, but are not limited to, the following:

- The baseline assessment is desk-based, observations made about features/sites are based on aerial imagery and can be challenging to verify/ascertain.
- Private surface water and groundwater abstractions have not been considered at this scoping stage.
- GWDTEs are defined as wetlands which critically depend on groundwater flows or chemistry. A full assessment of GWDTEs has not been undertaken at this scoping stage. An initial, desk-based screening assessment has been undertaken using publicly available desk-based data such as maps [560], the EA's GWDTE database [561], and brief online descriptions of the EIA Scoping Area from LPAs' websites. This data will be validated by field surveys, if needed. For further details, refer to chapter 6 terrestrial biodiversity of this Scoping Report.
- No hydraulic modelling has been undertaken to assess the impact of the Proposed Development on flood risk. This is considered proportionate at this scoping stage. The assessment has considered the potential magnitude of impact on flood risk (and therefore likely significance of effect) based on the extent of flood zones crossed, surface water flow paths intercepted and degree of flood risk from other existing data sources. These data sources, including EA flood models, may not account for all features relevant to the assessment.

## 9.9 Supporting Assessments

### Flood Risk Assessment

9.9.1 An FRA will be prepared to support the ES. The FRA will be undertaken in accordance with the NPSWRI, National Planning Policy Framework ('NPPF') [562] and associated Flood Risk and Coastal Change guidance. Flood risk assessments for planning and DCO applications are required for all developments.

- 9.9.2 The FRA will assess the compatibility of the Proposed Development with the Flood Zones on the Flood Map for Planning service. The assessment of flood risks will consider the existing site in terms of flood risks from all sources. Where relevant, the FRA will consider the coastal erosion risk implications on flood risk as well as the interactions between the above listed flood sources.
- 9.9.3 The FRA will include a Sequential Test which is designed to ensure new development is directed to areas with the lowest probability of flooding from fluvial, tidal and surface water sources. For proposals located within any form of flooding risk, applicants must demonstrate through a Sequential Test that there are no reasonably available sites at lower flood risk that could accommodate the development. If such alternatives exist, planning permission is unlikely to be granted.
- 9.9.4 The FRA will determine whether an Exception Test is required. This will be based on the vulnerability classification of the Proposed Development in line with Annex F of the NPPF (2026) [563]. The Exception Test is applied where a development is located in Flood Zones 2 or 3 and is designed to assess whether the development is sustainable and if it will increase flood risk elsewhere.
- 9.9.5 Finally, the FRA will outline measures to avoid, control, mitigate and manage flood risk where appropriate.

#### **WFD Compliance Assessment**

- 9.9.6 A WFD Compliance Assessment will be carried out to support the ES. This will be prepared in line with The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 [564] as well as other relevant guidance documents. The outcomes of the WFD Compliance Assessment will directly inform the conclusions of the water environment chapter of the ES and the marine biodiversity chapter of the ES where coastal waters are affected.

- 9.9.7 The purpose of the WFD Compliance Assessment is to determine the Proposed Development's compliance with The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 [565]. Consideration of the impacts of the Proposed Development on the supporting elements that contribute towards water bodies' achievement of good ecological status ('GES') or, for HMWBs or AWBs' good ecological potential ('GEP') water bodies is a key part of this assessment. This is to ensure that the Proposed Development does not prevent the achievement of GES/GEP or cause a deterioration in the supporting elements contributing towards achieving this objective.
- 9.9.8 The assessment includes the following stages:
- Stage 1: Screening – Includes an overview of the Proposed Development and outlines construction, operational and decommissioning phase activities. These activities are either screened in for further assessment or screened out.
  - Stage 2: Scoping – Identifies the relevant designated water bodies within the study area as well as potential risks to these water bodies, and their supporting elements, arising from activities during the construction, operational and decommissioning phases of the Proposed Development. These activities are then scoped in or out of further assessment.
  - Stage 3: Compliance Assessment – A five-step assessment approach will be undertaken for the activities and designated water bodies carried forward from the screening and scoping stages:
    - Site-specific assessment of the Proposed Development against quality elements.
    - Assessment of the Proposed Development against RBMP mitigation measures.
    - Cumulative impact assessment with other developments planned.
    - Assessment of the Proposed Development against status objectives of the relevant designated water bodies.
    - Assessment of the Proposed Development against other linked legislation (protected areas).
- 9.9.9 It should be noted that a deterioration in the status of any water bodies within the study area is not expected. Mitigation and avoidance of status deterioration will be pursued as part of the ongoing impact assessment and will be included as part of the design process. It should be noted that this is

subject to change and will be reviewed throughout the WFD Compliance Assessment process.

### Hydrogeological Impact Assessment

- 9.9.10 The Hydrological Impact Assessment will examine and assess the impacts of the Proposed Development on groundwater receptors pre- and post-mitigation and will be carried out in accordance with the DMRB LA 113 Guidance [566] (which is widely applied by the industry to linear infrastructure projects) and the EA's Hydrogeological Impact Assessment Appraisal for Groundwater Abstractions (2007a) and Hydrogeological Impact Appraisal for Dewatering Abstractions (2007b).
- 9.9.11 The assessment will follow a three-step approach:
- Step 1 – Establish regional groundwater body status.
  - Step 2 – Develop a conceptual model for the surrounding area.
  - Step 3 – Identify all potential features which are susceptible to groundwater level and flow impacts.
- 9.9.12 The assessment of potential effects resulting from the construction, operation and decommissioning of the Proposed Development will be developed in the Hydrological Impact Assessment.
- 9.9.13 The source-pathway-receptor model will be used and applied to relevant receptors that are sensitive to groundwater levels/flow.
- 9.9.14 For GWDTEs, an assessment will follow a stepped, risk-based approach as outlined in Appendix B of the DMRB LA 113 Guidance [567]. This approach depends upon identifying linkages between potential impacts arising as a result of the Proposed Development on the hydrological and hydrogeological regime and GWDTEs.
- 9.9.15 The site-specific conceptual hydrogeological model (as outlined above) will be developed to provide an overview of the linkages between groundwater and surface water, identifying possible connections between potential impacts from the Proposed Development and GWDTEs during the

construction, operational and decommissioning phases. The hydrogeological model will take account of groundwater flow paths, groundwater levels and the proximity of GWDTEs.

## **9.10 Summary of Impacts and Effects**

- 9.10.1 Table 9-37 provides a summary of the receptors, potential effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the water environment chapter of the ES for the Proposed Development's construction, operational and decommissioning phases.

Table 9-37: Summary of Water Environment Scope

| Receptor Type                              | Effects                                                                                                                                                                                            | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Scoped in / Scoped out |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>Construction/Decommissioning Phases</b> |                                                                                                                                                                                                    |                             |                               |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |
| Surface Water Quality                      | Release of polluting substances from site activities during construction / decommissioning (e.g. fuel leaks into adjacent watercourses). Effects on the chemical and biological quality of waters. | Negligible - Moderate       | Low - High                    | Significant                                    | <p>Implementation of non-invasive construction techniques.</p> <p>Provision of attenuation storage in the form of SuDS.</p> <p>Treatment of discharged water will be required to remove potential contaminants (e.g., chlorine).</p> <p>Undertaking of work in line with best practice for pollution prevention and relevant code of construction practices.</p> <p>Preparation of an Incident Response Plan and implement, if required.</p> <p>Preparation an Emergency Pollution</p> | Scoped in              |



| Receptor Type | Effects                                                                                                                         | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                        | Scoped in / Scoped out |
|---------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                 |                             |                               |                                                | Response Plan and implement, if required. Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                          |                        |
|               | Release of fine sediment to suspension leading to sediment pollution. Effects on the chemical and biological quality of waters. | Negligible - Moderate       | Low - High                    | Significant                                    | Site selection to avoid (where possible) release of sediments into watercourses and water bodies.<br>Provision of attenuation storage in the form of SuDS.<br>Programme and sequence activities to ensure work within watercourses and water bodies is undertaken during dry periods of low flow. | Scoped in              |

| Receptor Type | Effects | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Scoped in / Scoped out |
|---------------|---------|-----------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |         |                             |                               |                                                | <p>Implementation of measures to control silty water during construction.</p> <p>Implementation of silt fences or silt traps where works occur near a watercourse or water body, where appropriate.</p> <p>Treatment of discharged water will be required to remove silt.</p> <p>Undertaking of work in line with best practice for pollution prevention and relevant code of construction practices.</p> <p>Development, implementation and monitoring of a Sediment Management Plan.</p> <p>Develop an Emergency Pollution Response Plan.</p> |                        |

| Receptor Type | Effects                                                                                                                                                         | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                         | Scoped in / Scoped out |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                 |                             |                               |                                                | Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                     |                        |
|               | Drainage and dewatering of construction areas may change local runoff patterns, change river flow regimes and change the entry point of runoff to water bodies. | Negligible - Moderate       | Low - High                    | Significant                                    | Provide attenuation storage in the form of SuDS.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP. | Scoped in              |
|               | Silty water runoff and accidental release of pollutants from watercourse crossings, accidental releases of pollutants and creation of new pathways for          | Negligible - Moderate       | Low - High                    | Significant                                    | Site selection to avoid (where possible) release of pollutants into watercourses and water bodies.<br>Using non-invasive construction techniques.                                                  | Scoped in              |

| Receptor Type | Effects                           | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Scoped in / Scoped out |
|---------------|-----------------------------------|-----------------------------|-------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | pollutants to reach watercourses. |                             |                               |                                                | <p>Provide attenuation storage in the form of SuDS to restrict runoff and contamination.</p> <p>For trenchless watercourse and water body crossings, launch pits and settlement tanks should be set back an appropriate distance from watercourses and water bodies. Spoil and residual waste material from drilling will be disposed of off-site to a permitted waste facility through an appropriately licenced contractor.</p> <p>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.</p> |                        |

| Receptor Type        | Effects                                                                                                                                                                    | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Scoped in / Scoped out |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Surface Water Supply | Pollution of a viable water resource through construction /decommissioning activities taking place upstream of a public or private water supply surface water abstraction. | Negligible - Moderate       | High - Very High              | Significant                                    | <p>Avoidance, wherever possible, of construction in areas with known water supply infrastructure or sources.</p> <p>Location and mapping of all PWS or public water supply assets and other service infrastructure before construction.</p> <p>Implement measures to prevent damage to services and to avoid pollution during service diversions, excavations and ground works.</p> <p>Liaise with water utility company to request suitable mitigation is implemented if services are disrupted by the works.</p> <p>The measures applied for surface water quality and hydromorphology will be suitable to protect</p> | Scoped in              |

| Receptor Type | Effects                                                                                                         | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                 | Scoped in / Scoped out |
|---------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                 |                             |                               |                                                | surface water supplies during construction. Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                                                 |                        |
|               | Temporary severance of a public or private water supply due to disruption of pipelines and other buried assets. | Negligible - Moderate       | High - Very High              | Significant                                    | Avoidance, wherever possible, of construction in areas with known water supply infrastructure or sources.<br>Location and mapping of all PWS or public water supply assets and other service infrastructure before construction.<br>Implement measures to prevent damage to services and to avoid pollution during service | Scoped in              |

| Receptor Type   | Effects                                                   | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Scoped in / Scoped out |
|-----------------|-----------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|                 |                                                           |                             |                               |                                                | <p>diversions, excavations and ground works.</p> <p>Liaise with water utility company to request suitable mitigation is implemented if services are disrupted by the works.</p> <p>The measures applied for surface water quality and hydromorphology will be suitable to protect surface water supplies during construction.</p> <p>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.</p> |                        |
| Hydromorphology | Increase in fine sediment delivery via silt-laden runoff. | Negligible - Moderate       | Low - High                    | Significant                                    | Site selection to avoid (where possible) release of suspended sediments                                                                                                                                                                                                                                                                                                                                                                                                                 | Scoped in              |

| Receptor Type | Effects | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Scoped in / Scoped out |
|---------------|---------|-----------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |         |                             |                               |                                                | <p>into watercourses and water bodies.</p> <p>Avoidance (where possible) of significant alterations to bed and bank material of rivers and to avoid alterations to coastlines or shorelines of estuaries, lakes or reservoirs.</p> <p>Silt fences or silt traps will be used where works occur near a watercourse or water body where appropriate.</p> <p>Undertaking of work in line with best practice for pollution prevention and relevant code of construction practices.</p> <p>Production of an Incident Response Plan.</p> <p>Development, implementation and monitoring of a</p> |                        |



| Receptor Type | Effects                                                                           | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                      | Scoped in / Scoped out |
|---------------|-----------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                   |                             |                               |                                                | Sediment Management Plan.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                                     |                        |
|               | Changes to flow dynamics and regimes from the discharge of construction drainage. | Negligible - Moderate       | Low - High                    | Significant                                    | Site selection to avoid (where possible) release of suspended sediments into watercourses and water bodies.<br>Avoidance (where possible) of significant alterations to bed and bank material of rivers and to avoid alterations to coastlines or shorelines of estuaries, lakes or reservoirs. | Scoped in              |
|               | Increase in impermeable areas (hardstanding,                                      | Negligible - Moderate       | Low - High                    | Significant                                    | Land drains temporarily affected during construction will be                                                                                                                                                                                                                                    | Scoped in              |

| Receptor Type | Effects                                                                            | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                          | Scoped in / Scoped out |
|---------------|------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | compacted soil) altering drainage networks.                                        |                             |                               |                                                | reconnected/reinstated after construction works are completed.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                    |                        |
|               | Loss of marginal or riparian vegetation adjacent to watercourses and water bodies. | Negligible - Moderate       | Low - High                    | Significant                                    | Avoidance (where possible) of significant alterations to bed and bank material of rivers and to avoid alterations to coastlines or shorelines of estuaries, lakes or reservoirs.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These | Scoped in              |

| Receptor Type | Effects                                                                                                                                            | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                        | Scoped in / Scoped out |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                    |                             |                               |                                                | documents will contain a SWMP.                                                                                                                                                                                                                                                                                                                                                                                    |                        |
|               | Temporary change to flow dynamics and sediment transport dynamics caused by in-channel and/or bankside works as well as any construction drainage. | Negligible - Moderate       | Low - High                    | Significant                                    | Any temporary outfalls would be aligned downstream at a 45° angle, submerging the outfall below the water line, if practicable, and setting the outfall back from the bank.<br><br>During any modifications to in-stream structures or other crossings, allow the watercourse or water body to continue to flow, for example using a flume.<br><br>Where practicable, avoiding/minimising any in-channel working. | Scoped in              |
|               | Drainage and dewatering of construction areas altering local runoff patterns, river flow regimes and the entry                                     | Negligible - Moderate       | Low - High                    | Significant                                    | Land drains temporarily affected during construction will be reconnected/reinstated after construction works are completed.                                                                                                                                                                                                                                                                                       | Scoped in              |

| Receptor Type | Effects                                                                                                                                                   | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                     | Scoped in / Scoped out |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | point of runoff to water bodies.                                                                                                                          |                             |                               |                                                | Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                                                                                                                                                                                                 |                        |
|               | Watercourse and water body crossings could lead to silty water runoff and creation of new pathways for silty water to reach watercourses or water bodies. | Negligible - Moderate       | Low - High                    | Significant                                    | <p>Site selection to avoid (where possible) release of suspended sediments into watercourses and water bodies.</p> <p>Avoidance (where possible) of significant alterations to bed and bank material of rivers and to avoid alterations to coastlines or shorelines of estuaries, lakes or reservoirs.</p> <p>Silt fences or silt traps will be used where works occur near a watercourse or water body where appropriate.</p> | Scoped in              |

| Receptor Type | Effects | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Scoped in / Scoped out |
|---------------|---------|-----------------------------|-------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |         |                             |                               |                                                | <p>Undertaking of work in line with best practice for pollution prevention and relevant code of construction practices.</p> <p>Production of an Incident Response Plan.</p> <p>Development, implementation and monitoring of a Sediment Management Plan.</p> <p>Vehicular crossing of all watercourses and water bodies will be by temporary open span bridges.</p> <p>For open cut crossings, watercourse and water body banks, channel profile and bed material will be reinstated following construction using natural material and to a condition at least as good as prior to construction. The natural</p> |                        |

| Receptor Type | Effects                                                                                                                                                                                                                                     | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                            | Scoped in / Scoped out |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                                                                                             |                               |                               |                                                | <p>flow of rivers or streams will not be permanently diverted or blocked. Natural flow rates will be maintained at all times using over-pumping or fluming.</p> <p>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.</p> |                        |
| Groundwater   | <p>Dewatering could occur (from cuttings or for construction /decommissioning of below ground structures). Changes to groundwater levels as a result of dewatering or changes to land cover could impact on local abstractions, surface</p> | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | <p>Undertake ground investigations including groundwater monitoring and permeability testing to assess effects of dewatering (where applicable).</p> <p>Undertake the works during the summer or late summer.</p>                                                                                                     | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                                                                                                                                                                                                                | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                 | Scoped in / Scoped out |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | water and habitats that rely on groundwater.                                                                                                                                                                                                                                                                                                                           |                               |                               |                                                | Ensure compliance with the requirements of the EA's approach to groundwater protection. Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase).                                                                                                                                                                                                          |                        |
|               | <p>The removal or disturbance of soils and superficial deposits during open-cut trenching can create preferential flow pathways and alter groundwater recharge and levels.</p> <p>The interception of perched aquifer horizons or groundwater levels lying close to the trench base during open cut trenching can alter natural groundwater behaviour and flow and</p> | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | <p>Keep excavation depth to the minimum required to avoid intersecting unnecessary hydrostratigraphic units.</p> <p>Undertake ground investigations, including monitoring groundwater levels, to establish baseline groundwater conditions and identify any perched aquifers or shallow groundwater prior to construction.</p> <p>Continued groundwater level monitoring during the construction phase</p> | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                    | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                             | Scoped in / Scoped out |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | may lead to groundwater inflows into construction areas.                                                                                                                   |                               |                               |                                                | <p>can help determine whether the works are influencing groundwater behaviour.</p> <p>Undertake the works during the summer or late summer.</p> <p>Temporary dewatering will prevent groundwater inflows into construction areas.</p> <p>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase).</p> |                        |
|               | The reduction of shallow storage resulting from open cut trenching could cause trenches to fill rapidly with groundwater or perched water during periods of high recharge. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | <p>Undertake the works during the summer or late summer.</p> <p>Monitor groundwater levels during the construction phase to help identify when adaptive measures are needed.</p>                                                                                                                                                                       | Scoped in              |



| Receptor Type | Effects                                                                                                                                               | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                          | Scoped in / Scoped out |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                       |                               |                               |                                                | Temporary dewatering will prevent trenches from filling during high recharge periods. Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase).                                                                                                     |                        |
|               | Dewatering could disrupt the natural pressure balance between fresh water and saline seawater and encourage saline intrusion into the aquifer system. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Minimise drawdown by ensuring only the minimum required lowering of groundwater levels is carried out. Monitor groundwater levels and salinity throughout the construction phase. Use low capacity dewatering (sump pumping or short-screen well points) that create smaller groundwater drawdowns. | Scoped in              |

| Receptor Type | Effects                                                                                                                                       | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                             | Scoped in / Scoped out |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | Spills or leaks of fuel, oil or other chemicals used during construction decommissioning could enter aquifers and affect groundwater quality. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Undertake the works during the summer or late summer.<br>Ensure compliance with the requirements of the EA's approach to groundwater protection guidance.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). | Scoped in              |
|               | The compaction of soils could change groundwater recharge by altering existing sub-surface flow paths or favouring overland flows.            | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Reduction of soil compaction during construction by minimising the number of construction vehicles and the frequency of their passing close to sensitive receptors.<br>Ensure compliance with the requirements of the EA's approach to                                 | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                                                                                                                                                                                                   | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                      | Scoped in / Scoped out |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                                                                                                                                                                                                           |                               |                               |                                                | groundwater protection guidance.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase).                                                                                                                                   |                        |
|               | The removal of vegetation and disturbance of ground during construction /decommissioning could cause changes to groundwater quality. This could lead to exposed soils which in turn could lead to greater leaching of natural substances in the soils. New preferential flow pathways could also be created and could cause mobilisation of contaminants. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Minimisation of the extent of the works as far as practicable.<br>Ensure compliance with the requirements of the EA's approach to groundwater protection guidance.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). | Scoped in              |

| Receptor Type | Effects                                                                                                                                                          | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                 | Scoped in / Scoped out |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | Effects of changes to groundwater flow or quality on secondary receptors such as groundwater abstractions, surface water or ecological receptors such as GWDTEs. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Undertaking of the works during the summer or late summer.<br>Designation of a sensitive receptor buffer to reduce disruption to any potential GWDTEs or groundwater abstractions.<br>Minimise the extent of the works as far as practicable.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). | Scoped in              |
|               | Reductions in groundwater levels as a result of dewatering could result in subsidence affecting structures.                                                      | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Use of low permeability cut-off walls to control groundwater flows and discharges.<br>Ensure compliance with the requirements of the EA's approach to                                                                                                                                                                                                      | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                              | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                         | Scoped in / Scoped out |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                                      |                               |                               |                                                | groundwater protection guidance.<br>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase).                                                                                                                                                                                                                                                                      |                        |
| Flood Risk    | Loss of floodplain storage due to construction / decommissioning activities taking place within the floodplain, or temporary construction compounds being located in the floodplain. | Negligible - Moderate adverse | Low - High                    | Significant                                    | Construction drainage to prioritise the use of SuDS where practicable.<br>Location of work areas outside areas at risk of flooding where possible.<br>Where this is not possible temporary floodplain compensation may be required to offset storage losses.<br>Develop a Flood Risk Management Action Plan/Method Statement.<br>Production of an Incident Response Plan.<br>Implementation of an OCEMP during the | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                 | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                              | Scoped in / Scoped out |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                         |                               |                               |                                                | construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                                                                                                                                                                                                                                                                                |                        |
|               | Temporary change in flow paths due to construction / decommissioning activities either blocking existing or creating new flow paths, resulting in increased flood risk. | Negligible - Moderate adverse | Low - High                    | Significant                                    | <p>Provision of temporary crossings or structures to maintain existing surface water overland flow paths.</p> <p>Designing construction areas to avoid crossing or altering flow routes and, where this is not possible, drainage or suitable attenuation areas should be sought and included in the construction area design; implementation of permeable surfaces in compounds where practicable.</p> <p>Where dewatering of excavations is undertaken, discharge</p> | Scoped in              |

| Receptor Type | Effects                                                                                                  | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                   | Scoped in / Scoped out |
|---------------|----------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                          |                               |                               |                                                | <p>shall be overland or to a watercourse or water body (with appropriate treatment where necessary) at the relevant greenfield runoff rate.</p> <p>Develop a Flood Risk Management Action Plan / Method Statement.</p> <p>Production of an Incident Response Plan.</p> <p>Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.</p> |                        |
|               | Alterations to, or blockage of culverts and other structures conveying water could result in a temporary | Negligible - Moderate adverse | Low - High                    | Significant                                    | <p>Develop a Flood Risk Management Action Plan/Method Statement.</p> <p>Production of an Incident Response Plan.</p>                                                                                                                                                                                                                                                                                                         | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                          | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                  | Scoped in / Scoped out |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | loss of capacity resulting in increased flood risk.                                                                                                                              |                               |                               |                                                | Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                                                                                                                                              |                        |
|               | Placing temporary structures in the channel could affect flood flow conveyance and pose risk of debris accumulating at temporary structures and further reduce channel capacity. | Negligible - Moderate adverse | Low - High                    | Significant                                    | Structures to be designed outside areas of flood risk where possible. Where this is not possible, clean span structures should be considered to minimise effects as far as practicable. In-stream structures to be appropriately designed, taking into account climate change over the life of the structure. Develop a Flood Risk Management Action Plan/Method Statement. | Scoped in              |



| Receptor Type | Effects                                                                                                                                                                                                                      | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                               | Scoped in / Scoped out |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                                                                              |                               |                               |                                                | Production of an Incident Response Plan. Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                                                                                  |                        |
|               | Any temporary increase in impermeable surface due to haul routes and temporary construction compounds could lead to increased surface water runoff volume and rate, subsequently resulting in an increased risk of flooding. | Negligible - Moderate adverse | Low - High                    | Significant                                    | Construction drainage to prioritise the use of SuDS where practicable. Locate work areas outside areas at risk of flooding where possible. Where this is not possible temporary floodplain compensation may be required to offset storage losses. Develop a Flood Risk Management Action Plan/Method Statement. Production of an Incident Response Plan. | Scoped in              |

| Receptor Type            | Effects                                                                                                                                                                                                                                                                                                                       | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                           | Scoped in / Scoped out |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|                          |                                                                                                                                                                                                                                                                                                                               |                             |                               |                                                | Implementation of an OCEMP during the construction phase (and an ODEMP during the decommissioning phase). These documents will contain a SWMP.                                                                                                                                                                                                                       |                        |
| <b>Operational Phase</b> |                                                                                                                                                                                                                                                                                                                               |                             |                               |                                                |                                                                                                                                                                                                                                                                                                                                                                      |                        |
| Surface Water Quality    | Contaminants deposited on impermeable surfaces are washed off during rainfall events and discharge to the local water environment. New discharges from infrastructure sites, shading by new structures and vegetation, and use of herbicides during operation could cause changes to dissolved oxygen levels and temperature. | Negligible - Moderate       | Low - High                    | Significant                                    | The operational drainage design would incorporate mitigation measures to treat and attenuate discharges from the pipe (such as SuDS features) to the standard required by the DMRB LA 113 Guidance and other standards contained within the DMRB.<br><br>Surface water runoff from new impermeable areas at new or expanded infrastructure sites will be treated and | Scoped in              |

| Receptor Type | Effects | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Scoped in / Scoped out |
|---------------|---------|-----------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |         |                             |                               |                                                | <p>attenuated at the site using measures such as petrol interceptors and attenuation ponds.</p> <p>Levels of contaminants in any discharge will be within limits likely to be set and flows will be controlled to levels appropriate to the receiving water.</p> <p>Regular water quality monitoring to detect any changes in water quality and take corrective actions.</p> <p>Any washout valve discharges from the pipeline components of the Proposed Development will need to be agreed with regulatory authorities and carried out in accordance with any conditions imposed in</p> |                        |

| Receptor Type | Effects                                                                                                                                                                                                                     | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Scoped in / Scoped out |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                                                                             |                             |                               |                                                | regulatory authorisations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                        |
|               | New or alterations to existing discharges to watercourses and water bodies could introduce new pollutants and contribute to a deterioration in WFD status of water bodies or jeopardise the WFD objectives of water bodies. | Negligible - Moderate       | Low - High                    | Significant                                    | <p>The operational drainage design would incorporate mitigation measures to treat and attenuate discharges from the pipe (such as SuDS features) to the standard required by the DMRB LA 113 Guidance and other standards contained within the DMRB.</p> <p>Levels of contaminants in any discharge will be within limits likely to be set and flows will be controlled to levels appropriate to the receiving water.</p> <p>Regular water quality monitoring to detect any changes in water quality and take corrective actions.</p> |                        |

| Receptor Type | Effects                                                                                                                      | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                       | Scoped in / Scoped out |
|---------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                              |                             |                               |                                                | Any washout valve discharges from the pipeline components of the Proposed Development will need to be agreed with regulatory authorities and carried out in accordance with any conditions imposed in regulatory authorisations. |                        |
|               | New abstractions could lead to a transfer of pollutants from the source to the pipeline.                                     | Negligible - Moderate       | Low - High                    | Significant                                    | Regular water quality monitoring to detect any changes in water quality and take corrective actions.                                                                                                                             | Scoped in              |
|               | Spills or leaks of fuels, or other chemicals used during maintenance work could enter water bodies and affect water quality. | Negligible - Moderate       | Low - High                    | Significant                                    | The operational drainage design would incorporate mitigation measures to treat and attenuate discharges from the pipe (such as SuDS features) to the standard required by DMRB LA 113 Guidance and other standards               | Scoped in              |

| Receptor Type        | Effects                                                                                                         | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                              | Scoped in / Scoped out |
|----------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|                      |                                                                                                                 |                             |                               |                                                | contained within the Design Manual for Roads and Bridges. Regular water quality monitoring to detect any changes in water quality and take corrective actions.                                                                                                          |                        |
| Surface Water Supply | Permanent severance of a public or private water supply due to disruption of pipelines and other buried assets. | Negligible - Moderate       | High - Very High              | Significant                                    | Design of the Proposed Development should avoid, wherever possible, areas with known water supply infrastructure or sources.<br>The measures applied for surface water quality and hydromorphology will be suitable to protect surface water supplies during operation. | Scoped in              |
| Hydromorphology      | Changes to flow and sediment dynamics may arise from any potential channel realignment.                         | Negligible - Moderate       | Low - High                    | Significant                                    | Any new outfalls would be designed to mitigate impacts on hydromorphology by being aligned                                                                                                                                                                              | Scoped in              |

| Receptor Type | Effects                                                                                                                                                             | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                            | Scoped in / Scoped out |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                     |                             |                               |                                                | <p>downstream at a 45° angle, submerging the outfall below the water line, if practicable, and setting the outfall back from the bank.</p> <p>Post-construction inspections and monitoring of new outfall structures, new in-stream structures and abstraction infrastructure will be undertaken.</p> <p>Designing permanent structures (i.e., abstraction and outfall structures) in line with best practice and CIRIA guidance.</p> |                        |
|               | Any new or alterations to existing outfall structures could result in loss of riparian vegetation around structures or removal of a length of natural channel bank. | Negligible - Moderate       | Low - High                    | Significant                                    | Any new outfalls would be designed to mitigate impacts on hydromorphology by being aligned downstream at a 45° angle, submerging the outfall below the water                                                                                                                                                                                                                                                                          | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                                                      | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                          | Scoped in / Scoped out |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                                                              |                             |                               |                                                | line, if practicable, and setting the outfall back from the bank.<br>Post-construction inspections and monitoring of new outfall structures, new in-stream structures and abstraction infrastructure will be undertaken.<br>Designing permanent structures (i.e. abstraction and outfall structures) in line with best practice and CIRIA guidance. |                        |
|               | Abstractions and discharges from new outfalls, and any increases in the discharge/abstraction rates of existing outfalls/abstractions, could cause localised changes in flow regime and dynamics potentially | Negligible - Moderate       | Low - High                    | Significant                                    | Any new outfalls would be designed to mitigate impacts on hydromorphology by being aligned downstream at a 45° angle, submerging the outfall below the water line, if practicable, and                                                                                                                                                              | Scoped in              |



| Receptor Type | Effects                                                                                                                                                                                                         | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                | Scoped in / Scoped out |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | altering sediment transport dynamics.                                                                                                                                                                           |                             |                               |                                                | setting the outfall back from the bank.<br>Post-construction inspections and monitoring of new outfall structures, new in-stream structures and abstraction infrastructure will be undertaken.<br>Designing permanent structures (i.e. abstraction and outfall structures) in line with best practice and CIRIA guidance. |                        |
|               | New crossings have the potential to change the volume and rate of surface water runoff (including riparian drainage) entering a channel, potentially affecting its flow regime and sediment transport dynamics. | Negligible - Moderate       | Low - High                    | Significant                                    | Any route which avoids a new crossing or widening over water bodies is preferable. Where watercourse and water body crossings are required, a single span structure is preferred. If in-stream structures are required, their length would be kept to a minimum,                                                          | Scoped in              |

| Receptor Type | Effects                                                                                                                                                           | Anticipated Magnitude Range | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                | Scoped in / Scoped out |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                   |                             |                               |                                                | <p>appropriately tied-into the banks, whilst submerging the invert beneath the channel bed.</p> <p>Post-construction inspections and monitoring of new outfall structures, new in-stream structures and abstraction infrastructure will be undertaken.</p> <p>Designing permanent structures (i.e. abstraction and outfall structures) in line with best practice and CIRIA guidance.</p> |                        |
|               | Washout valve discharges for maintenance could impact flow rate within water bodies, leading to scour at the discharge point or channel bed, potentially altering | Negligible - Moderate       | Low - High                    | Significant                                    | Any new outfalls would be designed to mitigate impacts on hydromorphology by being aligned downstream at a 45° angle, submerging the outfall below the water line, if practicable, and                                                                                                                                                                                                    | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                                                                                                                  | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                | Scoped in / Scoped out |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | morphological processes.                                                                                                                                                                                                                                                 |                               |                               |                                                | setting the outfall back from the bank.<br>Post-construction inspections and monitoring of new outfall structures, new in-stream structures and abstraction infrastructure will be undertaken.<br>Designing permanent structures (i.e. abstraction and outfall structures) in line with best practice and CIRIA guidance. |                        |
| Groundwater   | Long-term dewatering could occur as a result of the Proposed Development. Changes to groundwater levels as a result of dewatering or reduced recharge due to changes to land cover could impact on underlying aquifers, local abstractions, surface water and ecological | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Avoid routes which pass through or close to the most sensitive areas such as GWDTE.<br>Locate drainage discharge points to ground and groundwater outside of the most sensitive areas, such as within the vicinity of GWDTEs.                                                                                             | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                                                                                    | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                 | Scoped in / Scoped out |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | receptors such as GWDTEs. Reductions in groundwater level could also result in subsidence affecting structures.                                                                                                                            |                               |                               |                                                | Planned repair and maintenance will only occur during low flow periods                                                                                                                                                     |                        |
|               | Effects of changes to groundwater flow or quality on primary and secondary receptors such as underlying aquifers, groundwater abstractions, surface water or ecological receptors such as GWDTE as a result of sub-surface infrastructure. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Avoid routes which pass through or close to the most sensitive areas such as GWDTE. Locate drainage discharge points to ground and groundwater outside of the most sensitive areas, such as within the vicinity of GWDTEs. | Scoped in              |
|               | Using a more permeable backfill material in open-cut trenches can create preferential flow pathways, altering recharge patterns and allowing pollutants to enter the aquifer system more readily. Conversely, if backfill is               | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Keep excavation depth to the minimum required. Backfill using the original excavated material wherever possible to maintain natural permeability and reduce the creation of                                                | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                                                                                                     | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                              | Scoped in / Scoped out |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | less permeable than the surrounding ground, groundwater may mound upslope and reduce groundwater levels downgradient.<br>ground) backfill material could cause groundwater mounding upslope and decrease groundwater levels downstream.                     |                               |                               |                                                | preferential flow pathways.<br>Monitor groundwater levels prior to construction to establish baseline groundwater conditions and continue during construction and the operational phase to identify any groundwater mounding or changes in groundwater behaviour.                                       |                        |
|               | Groundwater quality may be impacted if contaminants can migrate along the pipeline outside or by the mixing of different groundwater chemistries between aquifers due to new preferential flow pathways being introduced as a result of open cut trenching. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Monitor groundwater quality prior to construction to establish baseline groundwater quality conditions and continue monitoring during construction and the operational phase to identify any changes to groundwater quality.<br>Planned repair and maintenance will only occur during low flow periods. | Scoped in              |

| Receptor Type | Effects                                                                                                                                                        | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                             | Scoped in / Scoped out |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                                                |                               |                               |                                                | Water will be treated prior to discharge to remove potential contaminants.<br>Backfill using the original excavated material wherever possible to maintain natural permeability and reduce the creation of preferential flow pathways. |                        |
|               | Surface runoff from infrastructure sites discharged to groundwater could contain elevated concentrations of pollutants such as oils, suspended solids, metals. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Planned repair and maintenance will only occur during low flow periods.<br>Water will be treated prior to discharge to remove potential contaminants.                                                                                  | Scoped in              |
|               | Spills or leaks of fuels, or other chemicals used during maintenance work could enter aquifers and affect                                                      | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Planned repair and maintenance will only occur during low flow periods.                                                                                                                                                                | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                                  | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                     | Scoped in / Scoped out |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | groundwater quality, in the absence of suitable mitigation measures.                                                                                                                     |                               |                               |                                                | Water will be treated prior to discharge to remove potential contaminants.<br>Any washout valve discharges from the pipeline components of the Proposed Development will need to be agreed with regulatory authorities and carried out in accordance with any conditions imposed in regulatory authorisations. |                        |
|               | Suspended sediments in runoff from infrastructure sites associated with larger and/or new impermeable areas could lead to sediment pollution in receiving watercourses and water bodies. | Negligible - Moderate adverse | Medium - Very High            | Significant                                    | Planned repair and maintenance will only occur during low flow periods.<br>Water will be treated prior to discharge to remove potential contaminants.                                                                                                                                                          | Scoped in              |

| Receptor Type | Effects                                                                                                                                                                   | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                           | Scoped in / Scoped out |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Flood Risk    | Loss of floodplain storage during operation due to infrastructure encroaching into the floodplain, resulting in increased flood risk.                                     | Negligible - Moderate adverse | Low - High                    | Significant                                    | Drainage to prioritise the use of SuDS where practicable.<br>Locate work areas outside areas at risk of flooding where possible. Where this is not possible temporary floodplain compensation may be required to offset storage losses.<br>Production of an Incident Response Plan.<br>Develop a Flood Risk Management Action Plan/Method Statement. | Scoped in              |
|               | The increase in impermeable areas during operation could lead to increased surface water runoff volume and rate, subsequently resulting in an increased risk of flooding. | Negligible - Moderate adverse | Low - High                    | Significant                                    | Drainage to prioritise the use of SuDS where practicable.<br>Production of an Incident Response Plan.<br>Develop a Flood Risk Management Action Plan/Method Statement.                                                                                                                                                                               | Scoped in              |



| Receptor Type | Effects                                                                                                                                | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Scoped in / Scoped out |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               | Development in the floodplain may interrupt surface water and fluvial flow paths, diverting flows and increasing flood risk elsewhere. | Negligible - Moderate adverse | Low - High                    | Significant                                    | <p>Provision of crossings or in-stream structures to maintain existing surface water overland flow paths.</p> <p>Locate work areas outside areas at risk of flooding where possible. Where this is not possible temporary floodplain compensation may be required to offset storage losses.</p> <p>Designing construction areas to avoid crossing or altering flow routes and, where this is not possible, drainage or suitable attenuation areas should be sought and included in the construction area design; implementation of permeable surfaces in compounds where practicable.</p> | Scoped in              |

| Receptor Type | Effects                                                                                                                              | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                    | Scoped in / Scoped out |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                      |                               |                               |                                                | Where dewatering of excavations is undertaken, discharge shall be overland or to a watercourse / water body (with appropriate treatment where necessary) at the relevant greenfield runoff rate.<br>Production of an Incident Response Plan.<br>Develop a Flood Risk Management Action Plan/Method Statement. |                        |
|               | Washout discharges for maintenance could impact flow rate within water bodies, potentially leading to local increases in flood risk. | Negligible - Moderate adverse | Low - High                    | Significant                                    | Any washout valve discharges from the pipeline components of the Proposed Development will need to be agreed with regulatory authorities and carried out in accordance with any conditions imposed in                                                                                                         | Scoped in              |

| Receptor Type | Effects                                                                                                                                    | Anticipated Magnitude Range   | Anticipated Sensitivity Range | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                          | Scoped in / Scoped out |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|               |                                                                                                                                            |                               |                               |                                                | regulatory authorisations.<br>Production of an Incident Response Plan.<br>Develop a Flood Risk Management Action Plan/Method Statement.                                                                                                                                                                                             |                        |
|               | Discharges from new outfalls, and any increases in the discharge rate of existing outfalls, could cause localised increases in flood risk. | Negligible - Moderate adverse | Low - High                    | Significant                                    | Any new discharges from the pipeline components of the Proposed Development will need to be agreed with regulatory authorities and carried out in accordance with any conditions imposed in regulatory authorisations.<br>Production of an Incident Response Plan.<br>Develop a Flood Risk Management Action Plan/Method Statement. | Scoped in              |

## 10 Landscape and Visual

### 10.1 Introduction

- 10.1.1 This chapter outlines the proposed scope and methodology for the assessment of the likely significant effects resulting from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on landscape and visual impacts. The assessment will be presented within the Environmental Statement (‘ES’) submitted in support of the application for a Development Consent Order (‘DCO’). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.
- 10.1.2 The EIA Scoping Area is shown on Figure 1-1. This chapter should be read in conjunction with the following chapters of this Scoping Report:
- Chapter 2 The Proposed Development.
  - Chapter 3 EIA Methodology.
  - Chapter 11 Terrestrial Historic Environment.
  - Chapter 12 Marine Historic Environment.
  - Chapter 19 Agricultural Land and Soils.
- 10.1.3 A Landscape and Visual Impact Assessment (‘LVIA’) is the process of evaluating the effects of a proposed development upon both the landscape and visual amenity. For the assessment of the potentially significant effects of the Proposed Development during the construction, operational and decommissioning phases, the landscape assessment will consider the effects of change and development on landscape resources, and the visual impact assessment will consider the effects of change and development on the people who live in or visit the landscape, and who will experience views of the Proposed Development.

- 10.1.4 As the Proposed Development also includes a long sea outfall ('LSO') component (a new LSO comprises one of three options for this component, as set out in chapter 2 the Proposed Development), effects on seascape character will also be considered, with reference to adopted seascape character areas. These are summarised in Table 10.4.10.
- 10.1.5 The author of this chapter has over 30 years' experience as a Chartered Landscape Architect. They are experienced in carrying out LVIA's as well as acting as an expert witness in relation to several nationally significant infrastructure projects ('NSIPs'). They have had professional involvement in numerous linear infrastructure projects.

## 10.2 Study Area

- 10.2.1 The proposed LVIA study areas have been informed by a detailed desk-based study. A Zone of Theoretical Visibility ('ZTV') is defined in the Guidelines for Landscape and Visual Impact Assessment, Third Edition (2013) [1] ('GLVIA3') as *'a map, usually digitally produced, showing areas of land within which, a development is theoretically visible.'* A ZTV shows areas of land and sea within which a development is theoretically visible and takes account of the topography of the surrounding landscape, excluding surface features, such as vegetation. Its purpose is to indicate a *'cautious 'worst case''* scenario for the extent of views of the Proposed Development up to a range where significant visual effects are likely to occur, in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) [2].
- 10.2.2 There is insufficient detail at this scoping stage regarding the parameters of the Proposed Development's design to prepare a 'Preliminary' ZTV. However, a Preliminary ZTV, followed by extensive fieldwork will be carried out to test the assumptions made during the desk study and inform the assessment in the ES. This will help to refine the Preliminary ZTV and corresponding study area to take account of the visual screening provided

by existing features, including built development and vegetation. It is anticipated that the Preliminary ZTV will be greatly reduced once vegetation is considered following site surveys, due to the significantly vegetated nature of much of the surrounding landscape.

- 10.2.3 In accordance with the Planning Inspectorate's NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026), a '*cautious 'worst case' approach*' will be applied when considering the likely extent of views, assuming construction activity across the whole of the Proposed Development. Construction and operational phase ZTVs will be presented in the landscape and visual chapter of the ES.
- 10.2.4 In the absence of a ZTV at the time of writing, a comprehensive field study has been undertaken of the entire EIA Scoping Area in order to assess the likely extent of views of the Proposed Development. Scoping stage representative viewpoints have been identified and are detailed in Appendix 10.4 and Figure 10-4.
- 10.2.5 To reflect the anticipated distances within which significant effects may occur to particularly sensitive receptors, the study areas have been identified as a 3km radius for landscape and a 5km radius for views from the boundary of the EIA Scoping Area, respectively, as shown in Figure 10-1 to Figure 10-3.
- 10.2.6 The study areas may be further refined to focus the assessment or extend areas to include other sensitive receptors as the design of the Proposed Development evolves. Such changes may be made in response to survey data, as well as through engagement with statutory consultees, including Natural England ('NE') and the relevant Local Planning Authorities ('LPAs'). These comprise:
- Suffolk County Council ('SCC').
  - Norfolk County Council ('NCC').
  - East Suffolk Council ('ESC').
  - Mid Suffolk District Council ('MSDC').

- South Norfolk District Council ('SNDC').
- Great Yarmouth Borough Council ('GYBC').
- Broads Authority ('BA').

10.2.7 Appendix 10.1 to this chapter sets out the relevant legislation, policy and guidance relevant to the landscape and visual chapter of the ES. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

### 10.3 Consultation and Engagement

10.3.1 Non-statutory consultation has been carried out for the emerging proposals for the Proposed Development. All of the components of the Proposed Development have the potential to give rise to significant landscape and visual impacts. This consultation period ended on 17 December 2025. Feedback from this consultation will help to inform the selection of receptors, as well as appropriate mitigation and the selection of options.

10.3.2 A virtual meeting was held on 26 February 2026 with LPAs (SCC, NCC, BA, ESC and MSDC) to discuss the proposed approach to the scoping of landscape and visual effects and the proposed approach to surveys. Feedback and comments included queries on how the heritage and landscape viewpoints will be coordinated and whether valued landscapes such as the River Waveney will be covered. This feedback has been incorporated into this chapter, which cross-refers to chapter 11 terrestrial historic environment and chapter 12 marine historic environment, and has ensured that relevant valued landscapes are included (refer to Table 10-1). Broader concerns on landscape impacts and magnitude of effects were also noted, which are covered where relevant in this chapter, for example, in

10.3.3 Table 10-7 where the magnitude of impact is set out as well as the likely mitigation for the Proposed Development identified at this scoping stage.

10.3.4 Further engagement will be carried out with stakeholders following submission of the Scoping Report to the Planning Inspectorate regarding

the methodology of assessment and appropriateness of landscape and visual receptors detailed in the following figures:

- Figure 10-1 Landscape Character Areas - National and Local Landscape character areas (as identified in Appendix 10.2).
- Figure 10-2 Landscape Planning Context - National Parks and National Landscapes.
- Figure 10-3 Visual Receptors - point data from field maps and locations of example visual environment.

10.3.5 Figure 10-1 Landscape Character Areas is incomplete at the time of writing due to unavailability of data to represent the landscape character areas as defined by BA and SCC. These areas will be added within the ES.

## 10.4 Baseline Environment

10.4.1 Currently available baseline information relating to landscape and visual effects is summarised below. Existing baseline information has been obtained from the sources set out in Table 10-1.

Table 10-1: Sources of Baseline Data

| Baseline Data                                                                                                                                                                  | Source                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| LiDAR Digital Terrain Map – 1m resolution                                                                                                                                      | Environment Agency ('EA')                                                 |
| Ordnance Survey 1:25k mapping                                                                                                                                                  | Ordnance Survey ('OS')                                                    |
| The Broads National Park Special Qualities, taken from the Broads Plan (2022-2027) [3]                                                                                         | BA                                                                        |
| Suffolk and Essex Coast National Landscape Special Qualities, taken from their Management Plan (2023-2028) [4]                                                                 | Suffolk & Essex Coast & Heaths National Landscape Partnership ('SECHNLP') |
| National Character Area Profiles [5]:<br>79 - Northeast Norfolk and Flegg<br>80 - The Broads<br>82 - Suffolk Coast and Heaths<br>83 - South Norfolk and High Suffolk Claylands | NE                                                                        |
| The Broads - Landscape Character Assessment (2016) [6]                                                                                                                         | BA                                                                        |
| South Norfolk & Broadland Landscape Character Assessment (2013) [7]                                                                                                            | Broadland District Council                                                |



| Baseline Data                                                                                   | Source                                                  |
|-------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Joint Babergh and Mid Suffolk District Council Landscape Guidance (2015) [8]                    | Joint Babergh and Mid Suffolk District Council          |
| Suffolk Landscape Character Assessment (County-Wide) (2008) [9]                                 | SCC                                                     |
| Seascape Character Area Assessment East Inshore and East Offshore Marine Plan Areas (2012) [10] | Marine Management Organisation ('MMO')                  |
| Suffolk Coastal Landscape Character Assessment (Final Report, July 2018) [11]                   | ESC                                                     |
| Waveney Landscape Character Assessment (2008) [12]                                              | Waveney District Council ('WDC')                        |
| Waveney Valley Valued Landscape Assessment (2024) [13]                                          | WDC                                                     |
| Seascape Character Assessment for the East Inshore and Offshore Marine Plan Areas (2024) [14]   | MMO                                                     |
| Light Pollution and dark skies mapping (Broads Plan Appendix 15) (2016) [15]                    | BA                                                      |
| Public Rights of Way ('PRoW'), including National Trails and long-distance footpaths            | OS, National Trails official website, the LPAs.         |
| Tranquillity mapping [16]                                                                       | Campaign for the Preservation of Rural England ('CPRE') |
| National Cycle Network and cycle routes                                                         | OS                                                      |
| Tree Preservation Orders ('TPOs')                                                               | The LPAs                                                |
| Registered Parks and Gardens [17]                                                               | Historic England ('HE')                                 |
| Historic OS mapping [18]                                                                        | National Library of Scotland ('NLS')                    |
| Google Earth Map Data and Street View                                                           | Google                                                  |

10.4.2 The potential sensitive receptors are identified and grouped according to each component of the Proposed Development, also referred to as 'sections of the EIA Scoping Area', which include:

- Proposed Advanced Water Recycling Plant ('AWRP').
- Proposed Long Sea Outfall ('LSO').
- Proposed Central Service Reservoir ('CSR').
- Proposed Western Service Reservoir ('WSR').
- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.

- Proposed CSR Pipeline to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C ('SZC') Pipeline.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

10.4.3 Receptors are illustrated in the following figures:

- Figure 10-1 Landscape Character Areas.
- Figure 10-2 Landscape Planning Context.
- Figure 10-3 Visual Receptors.

10.4.4 Numerous receptors are likely to be affected by multiple components of the Proposed Development, therefore, to reduce duplication, descriptions of landscape receptors are set out in Appendix 10.2.

10.4.5 The assessment in the landscape and visual chapter of the ES will assess likely significant effects on receptors likely to be affected by the Proposed Development. Landscape receptors will include nationally designated areas of importance including National Parks and National Landscapes (formerly Areas of Outstanding Natural Beauty). Local landscape character areas will also be assessed. These will be identified using adopted Landscape Character Assessments ('LCAs') published by the relevant LPAs.

10.4.6 The assessment will have regard to the National Planning Policy Framework ('NPPF'), which states at Policy N5 that substantial weight should be given to the importance of conserving and enhancing landscape and scenic beauty in National Parks, the Broads and National Landscapes.

10.4.7 In accordance with Policy CC1 of the NPPF, the assessment will also have regard to the role of landscapes in supporting climate resilience, nature recovery and green infrastructure. In addition to considering effects on landscape character and visual amenity, the assessment will summarise the contribution of existing landscape features such as woodland, hedgerows, watercourses and connected habitat networks to ecosystem functioning, landscape connectivity and climate adaptation. These issues will be taken

into account in the overall sensitivity of, and magnitude of impact to, landscape character area receptors.

- 10.4.8 Visual Receptors are detailed in Appendix 10.3 and in Figure 10-3.
- 10.4.9 Special Landscape Areas ('SLAs') were previously designated in the Suffolk Structure Plan 2001 [19]. These were primarily river valleys and tributaries with special landscape attributes that are particularly vulnerable to change. However, government guidance and best practice advise that a LCA approach should be taken to inform policy making and planning decisions, rather than locally defined area specific landscape designations, which led to local authorities commissioning LCAs to inform decision making. This is reflected by the absence of reference to SLAs in the landscape related policies of the Waveney Local Plan (adopted in March 2019), the Suffolk Coastal Local Plan (adopted in September 2020) and the Babergh District Council & Mid Suffolk District Council Joint Local Plan (adopted in November 2023). Therefore, for SLAs, whilst reference to their key characteristics and sensitivities will be made, these will not be included as individual receptors in the assessment of the Proposed Development's likely significant landscape effects on landscape in the ES.
- 10.4.10 The Waveney Local Plan relies on the Waveney Landscape Character Assessment (2008). The Waveney Valley has previously been recognised as valued landscape, but this is not designated as such in the Local Plan. However, the Waveney Valley Valued Landscape Assessment (2024) identified it as a valued landscape using National Planning Policy Framework ('NPPF') terminology [20]. It constitutes supporting evidence rather than a policy designation and will be referenced in the assessment in the landscape and visual chapter of the ES rather than being treated as an individual receptor.
- 10.4.11 Areas of landscape within the boundary of SNDC are likely to be affected by the Proposed Development. SNDC identifies landscape value primarily through LCA and policy, rather than mapped areas of landscape designation. This includes a combination of protection zones, strategic gaps

and river valley policies. These will be referenced in the assessment in the landscape and visual chapter of the ES, but the key receptors will be identified from adopted LCAs.

10.4.12 The visual receptors described in Table 10-2 are principally settlements where multiple residential properties, as well as public open spaces, at the edge of the settlement, are likely to be subject to potentially significant visual effects. Individual residential properties are also likely to be affected and will be identified and refined through site surveys as the EIA process progresses and used to inform the ES. Further details on the identified principal visual receptors is provided in Appendix 10.3, based on desk studies and site surveys undertaken to date.

10.4.13 Table 10-2 below sets out the principal landscape and visual receptors that have been identified through desk studies and site surveys for each section of the EIA Scoping Area.

Table 10-2: Landscape and Visual Receptors for each EIA Scoping Area Section

| EIA Scoping Area Section | Landscape and Seascape Receptors                                                                                                                                                                                                                                                                                                                                                                           | Visual Receptors                                                                                                                                                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed AWRP            | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Plateau Estate Farmlands.</li> </ul>                                                                                                                                                                                                                                                                        | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Hopton-on-Sea.</li> </ul> <p>Local highways (including A47, NCR 517).<br/>PRoW incl. Norfolk Coast Path.<br/>Individual dwellings/farms.</p>                                           |
| Proposed LSO             | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Developed Nearshore Waters.</li> <li>• Coastal Dunes and Shingle Ridges.</li> <li>• Plateau Estate Farmlands.</li> </ul> <p>Seascape Character Assessment for the East Inshore and Offshore Marine Plan Areas (2024):</p> <ul style="list-style-type: none"> <li>• MCA 9 Norfolk Coastal Waters.</li> </ul> | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Hopton-on-Sea.</li> <li>• Corton.</li> <li>• Gunton.</li> <li>• Lowestoft North Beach.</li> </ul> <p>Local highways (including NCR 517).<br/>PRoW.<br/>Individual dwellings/farms.</p> |

| EIA Scoping Area Section                | Landscape and Seascape Receptors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Visual Receptors                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed CSR                            | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Rolling Estate Claylands.</li> <li>• Rolling Valley Claylands.</li> <li>• Ancient Estate Claylands.</li> <li>• Valley Meadow and Fens.</li> </ul>                                                                                                                                                                                                                                                                                                                           | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Sibton.</li> <li>• Sibton Green.</li> <li>• Hemp Green.</li> <li>• Peasenhall.</li> </ul> <p>Local highways (including NCR 1).<br/>PRoW.<br/>Individual dwellings/farms.</p>                                                                                                                                                                                                              |
| Proposed WSR                            | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Rolling Valley Claylands.</li> <li>• Rolling Valley Farmlands and Furze.</li> <li>• Wooded Valley Meadowlands and Fens.</li> <li>• Ancient Plateau Claylands.</li> </ul>                                                                                                                                                                                                                                                                                                    | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Thrandeston.</li> <li>• Mellis.</li> <li>• Yaxley.</li> <li>• Brome.</li> <li>• Eye Industrial Park.</li> </ul> <p>A140 &amp; local highways (including NCR 30)<br/>PRoW.<br/>Individual dwellings/farms.</p>                                                                                                                                                                             |
| Proposed AWRP to River Waveney Pipeline | <p>The Broads National Park.</p> <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Plateau Estate Farmlands.</li> <li>• Wooded Valley Meadowlands and Fens.</li> <li>• Coastal Levels.</li> </ul> <p>The Broads - Landscape Character Assessment (2016):</p> <ul style="list-style-type: none"> <li>• Area 2 Waveney Valley - Bungay/Ditchingham to Shipmeadow/Geldeston.</li> <li>• Area 3 Waveney Valley - Barsham, Gillingham and Beccles Marshes.</li> <li>• Area 4 Waveney Valley - Aldeby to Burgh St Peter.</li> </ul> | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Hopton-on-Sea.</li> <li>• Lound;</li> <li>• Blundeston.</li> <li>• Toft Monks.</li> <li>• Wheatacre.</li> <li>• Waterheath.</li> <li>• Waterloo.</li> <li>• West End.</li> <li>• Dockney.</li> <li>• Kirby Cane.</li> </ul> <p>Recreation locations in Broads National Park.<br/>Local highways (including NCR 517).<br/>PRoW (including Angles Way).<br/>Individual dwellings/farms.</p> |

| EIA Scoping Area Section             | Landscape and Seascape Receptors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Visual Receptors                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | <ul style="list-style-type: none"> <li>Area 5 Waveney Valley - Worlingham Wall to Boundary Dyke Barnby.</li> <li>Area 6 Waveney Valley - Boundary Dyke Barnby to the Fleet, Oulton.</li> <li>Area 7 Waveney Valley - Burgh St Peter to Haddiscoe Marshes.</li> <li>Area 8 Waveney Valley - Flixton to Herringfleet Marshes.</li> <li>Area 9 Waveney Valley - St Olaves to Burgh Castle.</li> <li>Area 16 Yare/Waveney Norton Marshes to Haddiscoe dismantled railway.</li> </ul> <p>South Norfolk District Landscape Character Assessment (2006):</p> <ul style="list-style-type: none"> <li>A5: Waveney Rural River Valley.</li> <li>B5: Chet Tributary Farmland.</li> <li>C2 Thurlton Tributary Farmland and Parkland.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                            |
| Proposed Barsham WTW to CSR Pipeline | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>Rolling Valley Claylands.</li> <li>Ancient Estate Claylands.</li> <li>Plateau Claylands.</li> <li>Wooded Valley Meadowlands and Fens.</li> <li>Ancient Plateau Claylands.</li> <li>Valley Meadowlands.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>Settlements:</p> <ul style="list-style-type: none"> <li>Ringsfield.</li> <li>Ringsfield Corner.</li> <li>High Street.</li> <li>Ilketshall St Andrew.</li> <li>St Lawrence.</li> <li>Spexhall.</li> <li>Wissett.</li> <li>Broadway.</li> <li>Halesworth.</li> <li>Walpole.</li> </ul> <p>Local highways (including NCR 1).<br/>PRoW.<br/>Individual dwellings/farms.</p> |
| Proposed CSR to WSR Pipeline         | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>Rolling Valley Claylands.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Settlements:</p> <ul style="list-style-type: none"> <li>Sibton.</li> <li>Sibton Green.</li> </ul>                                                                                                                                                                                                                                                                       |

| EIA Scoping Area Section            | Landscape and Seascape Receptors                                                                                                                                                                                                                                                                                                                                               | Visual Receptors                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | <ul style="list-style-type: none"> <li>• Ancient Estate Claylands.</li> <li>• Plateau Claylands.</li> <li>• Wooded Valley Meadowlands and Fens.</li> <li>• Ancient Plateau Claylands.</li> </ul>                                                                                                                                                                               | <ul style="list-style-type: none"> <li>• Ubbeston.</li> <li>• Foals Green.</li> <li>• Russel's Green.</li> <li>• Wooten Green.</li> <li>• Athelington.</li> <li>• Denham.</li> <li>• Brome.</li> <li>• Horham.</li> <li>• Wilby.</li> <li>• Laxfield.</li> <li>• Heveningham.</li> </ul> <p>Local highways (including NCR 40).<br/>PRoW.<br/>Individual dwellings/farms.</p> |
| Proposed CSR to Saxmundham Pipeline | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Rolling Estate Sandlands.</li> <li>• Ancient Estate Claylands.</li> <li>• Rolling Estate Claylands.</li> <li>• Valley Meadows and Fens.</li> <li>• Rolling Valley Claylands.</li> </ul>                                                                                         | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Sibton.</li> <li>• Peasenhall.</li> <li>• Hemp Green.</li> <li>• Rotten End.</li> <li>• Carlton.</li> <li>• Saxmundham.</li> </ul> <p>Local highways (including NCR 1).<br/>PRoW.<br/>Individual dwellings/farms.</p>                                                                                           |
| Proposed Saxmundham to SZC Pipeline | <p>Suffolk &amp; Essex Coast &amp; Heaths National Landscape.</p> <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Nearshore Waters.</li> <li>• Coastal Dunes &amp; Shingle Ridges.</li> <li>• Estate Sandlands.</li> <li>• Coastal Levels.</li> <li>• Ancient Estate Claylands.</li> <li>• Rolling Estate Claylands.</li> </ul> | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Kelsale.</li> <li>• Curlew Green.</li> <li>• East Green.</li> <li>• Theberton.</li> </ul> <p>Local highways.<br/>PRoW (including Sandlings Walk, Suffolk Coastal Path, and King Charles III Coastal Path).<br/>Individual dwellings/farms.</p>                                                                  |

| EIA Scoping Area Section            | Landscape and Seascape Receptors                                                                                                                                  | Visual Receptors                                                                                                                                                                                                              |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proposed Eastern Distribution Mains | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Plateau Claylands.</li> <li>• Rolling Valley Claylands.</li> </ul> | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Brome.</li> <li>• Thrandeston.</li> <li>• Yaxley.</li> <li>• Mellis.</li> </ul> <p>Local highways<br/>PRoW.<br/>Individual dwellings/farms.</p>                  |
| Proposed Western Distribution Mains | <p>Suffolk Landscape Character Assessment (2008):</p> <ul style="list-style-type: none"> <li>• Plateau Claylands.</li> <li>• Rolling Valley Claylands.</li> </ul> | <p>Settlements:</p> <ul style="list-style-type: none"> <li>• Finningham.</li> <li>• Gislingham.</li> <li>• Dandy Corner.</li> </ul> <p>Local highways, Great Eastern Main Line.<br/>PRoW.<br/>Individual dwellings/farms.</p> |

## 10.5 Likely Significant Effects

10.5.1 This section describes typical impacts resulting from various components during each phase of the Proposed Development. It then describes the potential receptors and the potential likely significant effects that would occur as a result of the construction, operational and decommissioning phases of the Proposed Development.

### Construction Phase

10.5.2 Potentially significant landscape, seascape and visual impacts arising from the construction phase of the Proposed Development are likely to comprise:

- Removal of existing vegetation and field boundaries.
- Loss of protected trees and hedgerows.
- Alteration of landform and topography.
- Introduction of construction compounds and plant.
- Haul routes and increased vehicle movements.
- Open-cut trenching for pipeline installation.



- Construction of permanent and temporary structures.
- Lighting for safety and security.
- Modification of landscape and seascape pattern and character.
- Temporary diversions of PRow.
- Visual impacts from elevated structures.
- Construction noise and movement effects on tranquillity.
- Temporary stockpiling of materials.
- Introduction of security fencing and hoardings.
- Temporary change in land use.
- Temporary disruption or fragmentation of green infrastructure networks and landscape features that contribute to nature recovery and climate resilience.
- Cumulative landscape, seascape and visual impacts with other projects.

10.5.3 The duration of potential landscape, seascape and visual effects arising during the construction phase will be assessed in accordance with the construction programme set out in the ES.

### Operational Phase

10.5.4 Potentially significant landscape, seascape and visual effects arising from the operational phase of the Proposed Development are likely to result from any:

- Presence of above-ground infrastructure components of the Proposed Development including the proposed AWRP, CSR, and WSR structures and supporting infrastructure (for example, lighting and fencing), and the presence of above-ground fittings associated with the proposed pipeline components (for example, air valves and washout valves).
- Permanent loss of vegetation.
- Permanent changes to landscape pattern and boundaries.
- Permanent diversions and stopping up of PRow.
- Changes in highways and access arrangements.
- Permanent easements preventing mitigation planting or other development.
- Permanent changes to green infrastructure assets and landscape features that contribute to climate adaptation, carbon storage and nature recovery.
- Cumulative landscape, seascape and visual impacts with other projects.

- 10.5.5 The duration of potential landscape, seascape and visual effects arising during the operational phase may, without mitigation, typically be considered as permanent. However, mitigation planting will reduce the significance of any landscape or visual effects over time, and it is expected that the design objectives of such planting would be realised by the summer of the fifteenth year after the Proposed Development becomes fully operational.

### **Decommissioning Phase**

- 10.5.6 Decommissioning activities for the Proposed Development will be defined in the ES, and the effects are anticipated to be similar to the construction phase.

## **10.6 Impacts Scoped Out of the Assessment**

- 10.6.1 Landscape features such as ancient woodland, veteran trees and trees subject to tree preservation orders ('TPOs') located at distances of greater than 15m from the Order Limits are proposed to be scoped out of the assessment in the ES, as it is unlikely that the root protection zones of these will be directly impacted by the Proposed Development's construction, operational or decommissioning activities.
- 10.6.2 Hedgerows, including important hedgerows, as defined under The Hedgerows Regulations (1997) [21], will be directly impacted by the Proposed Development. Despite impacts occurring along the extent of the proposed pipeline components, these will be of a similar duration, nature, size and scale and will be limited to only the partial removal of any affected hedgerow, although the minimum length possible would be removed. For proportionality, the assessment of impacts on individual hedgerows is proposed to be scoped out of the assessment and instead, the ES would assess the Proposed Development's likely significant effects on hedgerows collectively. The likely length of hedgerows (if any) impacted by the construction of the Proposed Development's above-ground components (the proposed AWRP, CSR and WSR) is not yet known. However, should

likely significant effects on these hedgerows be anticipated due to these above-ground components, these effects would also be scoped into the assessment.

- 10.6.3 It is possible that structures and supporting infrastructure associated with the proposed AWRP, CSR, WSR and LSO components, as well as any permanent above ground components associated with the proposed pipeline, may result in perceptible changes in the composition of daytime views for visual receptors at distances of greater than 1km from the relevant component. However, any such changes are considered unlikely to materially alter the overall balance of features and elements comprising existing views. Therefore, visual receptors at distances of greater than 2km from the Proposed Development's above ground components during the operational phase, and from main/satellite compounds during the construction and decommissioning phases, are proposed to be scoped out of the assessment in the ES.

#### Night-time Assessment

- 10.6.4 The night-time assessment of likely significant visual effects has been scoped out of the ES, with the exception of the following receptors, which may be sensitive to night-time effects of lighting:
- High sensitivity viewpoints within 1km of above ground components during the operational phase.
  - High sensitivity viewpoints within 1km of proposed construction/decommissioning compounds.
  - All residential receptors within 500m of above ground components, where the daytime effects during operations are likely to be significant.
- 10.6.5 An assessment of night-time construction effects for pipelaying operations for the Proposed Development's pipeline components is proposed to be scoped out of the ES due to the transient and short-term nature of impacts at each location.

## 10.7 Proposed Approach to Mitigation

- 10.7.1 The outline mitigation measures described below should be treated as preliminary and will be reviewed and developed as the Proposed Development's design evolves and survey data is available, as well as in response to the findings of the assessment of its likely significant landscape and visual effects. A preliminary summary of mitigation measures is provided below.
- 10.7.2 Primary, secondary and tertiary mitigation relevant to landscape and visual effects would include, but are not limited to, the following measures.

### Primary (Inherent) mitigation

#### Operational Phase

- Design and siting of permanent buildings, structures and infrastructure to limit visual intrusion as far as practicable.
- Design of the proposed WSR and CSR components' embankments to seek to sympathetically integrate the earthworks into the surrounding landscape as far as practicable.

### Secondary (Foreseeable) Mitigation

#### Construction Phase

- As much existing vegetation as practicable would be retained within the Order Limits.
- Lighting design for construction activities would seek to reduce light spill as far as practicable.
- Construction elements such as compounds and car parks would be sited away from sensitive receptors such as residential areas, where practicable.
- Potential for advanced and phased planting prior to and during construction to establish mitigation planting as early as practicable.
- Where practicable, stripped soil would be stored in bunds around the perimeter of the construction areas to provide temporary screening.
- Potential use of hoarding as site security fencing to provide an additional temporary screening function.
- Consideration would be given to organising embankment construction for the proposed WSR and CSR components so that the outer elements are constructed first, thereby screening inner parts of the construction site during subsequent construction activities.

### Operational Phase

- Implementation of a Landscape and Ecology Management Plan ('LEMP') in accordance with the Outline Landscape and Ecology Management Plan ('OLEMP') to be submitted in support of the DCO application.
- Use of sensitive lighting design, such as light-emitting diodes, to reduce light spill.
- Planting, including hedgerows, woodland and copses, to help integrate above ground components into the surrounding landscape whilst also strengthening green infrastructure networks, supporting nature recovery and improving long-term landscape resilience to climate change.
- Mitigation for any loss of verified ancient and veteran trees on a tree-specific basis depending on the number and species.
- Landscape mitigation, habitat creation and restoration measures would, where practicable, be designed to contribute to wider green infrastructure objectives, strengthen ecological connectivity, support Local Nature Recovery Strategies and improve the resilience of landscape features to the effects of climate change.

### Tertiary (Inexorable) Mitigation

#### Construction Phase

- Implementation of a Construction Code of Practice ('CoCP').
- Retained trees would be protected in line with British Standards Institution's BS 5837: 2012 Trees in Relation to Design, Demolition and Construction [22].
- The supply, storage, handling and implementation of proposed planting would be undertaken in accordance with relevant British Standards, including BS 4428:1989 Code of Practice for General Landscape Operations (excluding hard surfaces) [23].

#### Operational Phase

- The maintenance of proposed planting would be undertaken in accordance with relevant British Standards, including BS 4428:1989 Code of Practice for General Landscape Operations (excluding hard surfaces).

## 10.8 Proposed Approach to the ES

### Best Practice Guidance

- 10.8.1 Relevant best practice guidance and standards which have been used at this scoping stage and will be used in the assessment in the ES comprise:

- GLVIA3 and subsequent statements of clarification [24].
- Landscape Institute (2021), Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations [25].
- NE (2014), An Approach to Landscape Character Assessment [26].
- Landscape Institute (2017), Technical Information Note 05/17: Townscape Character Assessment [27].
- NE (2012), An Approach to Seascape Character Assessment [28].
- Landscape Institute (2020), Technical Guidance Note 04/20: Infrastructure [29].
- Landscape Institute (2019), Technical Guidance Note 06/19: Visual Representation of Development Proposals [30].

## Assessment Methodology

- 10.8.2 The assessment of the Proposed Development's likely landscape, seascape and visual effects in the ES will be carried out in accordance with the GLVIA3, which recommends a proportionate approach focused on significant effects. The assessment will be based on the professional judgement of the assessor and consider both adverse and beneficial likely significant effects on the existing landscape character, landscape resources and the visual amenity of visual receptors.
- 10.8.3 The assessment in the ES will be informed by OS mapping, relevant national and local policy and a desk-based review of background documentation as set out above in Section 10.4, along with winter and summer fieldwork and photography.
- 10.8.4 The desk-based study and fieldwork will help to determine the existing landscape and visual context, thereby allowing an understanding of the likely magnitude of change and resulting significance of effect on the landscape resources and key visual receptors within the respective study areas.
- 10.8.5 Consultation feedback and engagement with statutory consultees will also inform the inclusion of sensitive receptors in the assessment, any guidance documents to be considered and the methodology for the assessment.

- 10.8.6 The assessment of likely significant landscape and visual effects in the ES will assume the following time periods:
- Construction: considers construction activities, temporary works and construction traffic during the construction period.
  - Winter ‘year 1’: considers the effects in winter of year 1, when the Proposed Development is operational, but planting mitigation would not yet be established and fully effective.
  - Summer ‘year 15’: considers the effects in summer of the fifteenth year following the completion of the Proposed Development, when planting mitigation is established and fully effective.
  - Decommissioning is assumed to take place after the predicted minimum 80-year project lifespan.
- 10.8.7 The assessment of likely significant landscape and visual effects will include winter and summer photography from each viewpoint. These will illustrate the change in view in winter ‘year 1’ and summer ‘year 15’ of the Proposed Development, respectively, and be carried out according to the GLVIA3.
- 10.8.8 In accordance with the Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026), the assessment of the Proposed Development’s effects during construction and in ‘year 1’ following its completion will adopt a *‘cautious ‘worst case’ approach’* and assume winter conditions, when existing vegetation is not in leaf. The assessment of the Proposed Development’s effects in summer ‘year 15’ will account for the established mitigation planting. Both day and night-time changes for relevant receptors will be considered as part of the overall assessment of landscape and visual effects.
- 10.8.9 The assessment approach described in this chapter is consistent with the objectives of the NPPF (2026), particularly Policies N1 (Identifying Environmental Opportunities and Safeguards), N2 (Improving the Natural Environment) and N4 (Protected Landscapes). These policies support the conservation and enhancement of landscape character (N1 (1-3)), natural beauty (N4 (1)), tranquillity (N4 (3)), dark skies (N4 (3)), cultural heritage (N4 (1)), biodiversity and ecological networks (N1 (1-2) and N2) and designated landscapes (N4 (1-4)). Particular regard will be given to

Protected Landscapes, including The Broads National Park and the Suffolk & Essex Coast & Heaths National Landscape, which are afforded the highest status of protection in relation to natural beauty under Policy N4.

- 10.8.10 The assessment will also consider effects on the setting, special qualities and statutory purposes of these designated landscapes where relevant. The proposed approach to mitigation and enhancement will be developed to support wider objectives relating to nature recovery, ecological connectivity, green infrastructure and climate resilience, where practicable.

### Landscape Effects

- 10.8.11 Landscape receptors identified for assessment will be drawn from local authority adopted LCAs. These are set out in Table 10-2.
- 10.8.12 The changes to the constituent landscape features, elements and components of the LCAs, such as trees, woods, hedgerows, hedgerow trees, landform, field patterns and cultural influences, as well as effects on dark skies and tranquillity, will be considered collectively as part of the effects on landscape character and not as individual receptors. This proportionate approach is in line with the GLVIA3.
- 10.8.13 The terrestrial historic environment chapter of the ES will undertake an assessment of potential effects on heritage features such as Registered Parks and Gardens and their settings, together with potential changes in the historic landscape. Further details are provided in chapter 11 terrestrial historic environment of this Scoping Report. The landscape assessment may make reference to effects on viewers in the settings heritage features, but effects on the features themselves will be addressed in the terrestrial heritage assessment.
- 10.8.14 Consideration will be given to the potential effects on each of the special qualities of the Broads National Park and the Suffolk and Essex Coast and Heaths National Landscape within the extent of the landscape study area. The assessment will consider effects on landscape character, scenic beauty, special qualities, tranquillity, dark skies and setting where relevant.



- 10.8.15 The assessment will also consider effects on the setting of designated landscapes where the Proposed Development may influence the experience, appreciation or special qualities of those areas.

### Visual Effects

- 10.8.16 Visual receptors are defined in the GLVIA3 as comprising locations where people may be present. Viewpoints will be selected through the ZTV, fieldwork and consultation and engagement with stakeholders. In accordance with the GLVIA3, these will potentially include the following types:

- *‘Representative viewpoints, selected to represent the experience of different types of visual receptor, where large numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ...’*
- *Specific viewpoints, chosen because they are key and sometimes promoted viewpoints within the landscape...*
- *Illustrative viewpoints, chosen specifically to demonstrate a particular effect or specific issues....’*

### Sensitivity of Receptors

- 10.8.17 The sensitivity of landscape and visual receptors will be established by assessing the value attached to a receptor and its susceptibility to the particular form of change likely to result from the Proposed Development.
- 10.8.18 The GLVIA3 defines landscape value as *‘The relative value that is attached to different landscapes by society’*. A review of existing designations is the starting point in understanding the value of landscape receptors and views experienced by visual receptors. However, the GLVIA3 recognises that landscape value is not always signified by designation. Other areas of landscape, or individual elements or features of the landscape contributing to its character or views may not be recognised by formal designation but may nevertheless have value. The range of factors provided within the Landscape Institute’s (2021) Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations will be considered in the identification of landscape value. The value of landscape and visual

receptors will be assessed in line with the criteria set out in Table 10-3 and Table 10-4.

10.8.19 Susceptibility to change is defined, in accordance with the GLVIA3, as the ability of a landscape or visual receptor to accommodate a development without undue adverse consequences. Judgements on susceptibility will take the nature of the Proposed Development into account. The GLVIA3 defines landscape and visual susceptibility as follows:

- Landscape susceptibility: the ability of a landscape receptor ‘to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies’.
- Visual susceptibility: the susceptibility of visual receptors to a change in their view and visual amenity is a function of ‘the occupation or activity of people experiencing the view at particular locations; and the extent to which their attention or interest may, therefore, be focused on the views and the visual amenity they experience at particular locations’.

10.8.20 The susceptibility of landscape and visual receptors to change will be assessed in line with the criteria set out in Table 10-4 and Table 10-6.

10.8.21 Sensitivity will be assessed on a four-point scale of high, medium, low or very low. Table 10-3 to Table 10-7 present the criteria for landscape and visual value and susceptibility to change that will be used to inform the assessment of sensitivity. The judgements of value and susceptibility for each receptor will be considered together and professional judgement used to determine which sensitivity rating best applies.

10.8.22 The application of these criteria is not a formulaic process. A receptor may be considered to be of high value, but the same receptor may not necessarily be of high susceptibility to the nature of the proposed change and is therefore of high sensitivity. For example, a National Landscape, though of high value, may be able to accommodate appropriate forms of development without undue effects and therefore might not be considered to be of high sensitivity. Conversely, landscapes and seascapes considered to be of lower landscape value may be highly susceptible to the nature of the proposed change. Judgements will therefore be made about each

receptor, with the criteria serving as a guide and balanced accordingly. A receptor of high value and low susceptibility (or vice versa) may, for instance, be considered to be of medium sensitivity overall.

Table 10-3: Criteria for Determining Landscape and Seascape Value

| Landscape Value | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High            | Areas of landscape and seascape identified/designated as having high importance and/or high value associated with factors* such as landscape and seascape condition, scenic and other perceptual qualities including tranquillity and dark skies, distinctiveness, rarity and representativeness, conservation interests (such as natural and cultural heritage), community, recreational and functional values and associations. This includes nationally designated landscapes and seascapes, for which specific comment will be made in the assessment. |
| Medium          | Some value associated with factors* such as landscape and seascape condition, scenic and other perceptual qualities including tranquillity and dark skies, distinctiveness, rarity and representativeness, conservation interests (such as natural and cultural heritage), community, recreational and functional values and associations.                                                                                                                                                                                                                 |
| Low             | Limited value associated with factors* such as landscape and seascape condition, scenic and other perceptual qualities including tranquillity and dark skies, distinctiveness, rarity and representativeness, conservation interests (such as natural and cultural heritage), community, recreational and functional values and associations.                                                                                                                                                                                                              |
| Very low        | Very little or no value associated with factors* such as landscape and seascape condition, scenic and other perceptual qualities including tranquillity and dark skies, distinctiveness, rarity and representativeness, conservation interests (such as natural and cultural heritage), community, recreational and functional values and associations.                                                                                                                                                                                                    |

\*Factors are based on those identified within Box 5.1 'Range of factors that can help in the identification of valued landscapes' in the GLVIA3 and Table 1: 'Range of factors that can be considered when identifying landscape value' in the Landscape Institute's (2021) Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations.

Table 10-4: Criteria for Determining Landscape and Seascape Susceptibility

| Landscape Susceptibility | Criteria                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                     | The landscape/seascape is highly susceptible to the nature of the Proposed Development because the relevant characteristics or elements of the landscape have a very limited ability to accommodate the Proposed Development without undue effects, for example, because it would result in the loss of characteristics that are an important component of the landscape or seascape. |
| Medium                   | The landscape/seascape is moderately susceptible to the nature of the Proposed Development because the relevant characteristics or elements of the landscape only have a limited ability to accommodate it without undue effects.                                                                                                                                                     |
| Low                      | The landscape/seascape has low susceptibility to the nature of the Proposed Development because the relevant characteristics or elements of the landscape are generally able to accommodate it without undue effects.                                                                                                                                                                 |
| Very low                 | The landscape/seascape is generally tolerant to the nature of the Proposed Development because the relevant characteristics or elements of the landscape and seascape are able to accommodate it without undue effects.                                                                                                                                                               |

Table 10-5: Criteria for Determining Visual Value

| Visual Value | Criteria                                                                                                                                                                                                                                                                                                                                                       |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High         | Views that are associated with areas of landscape and seascape identified/designated as having high importance including important heritage assets, promoted in sources such as maps and tourist literature, linked with popular destinations where the view forms a recognised part of the visitor experience, or which have important cultural associations. |
| Medium       | Views that are associated with landscapes and seascapes considered to be valued by local communities and which may be promoted in local sources and linked with locally important destinations where the view forms a recognised part of the visitor experience.                                                                                               |
| Low          | Views that, although they may have value to local people are not associated with designated or otherwise high-quality landscapes or with popular destinations and have no more widely recognised cultural associations.                                                                                                                                        |
| Very low     | Views with very little value to local people and not associated with destinations and with no cultural associations.                                                                                                                                                                                                                                           |

Table 10-6: Criteria for Determining Visual Susceptibility

| Visual Susceptibility | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                  | Receptors for whom the nature of the view forms an important part of their experience and visual amenity. These include people engaged in types of outdoor recreation where their attention is likely to be focused on particular views; visitors to heritage assets or other attractions where views of the surroundings are an important part of the experience; residents at home and communities where views contribute to the landscape setting enjoyed by residents. May include users of National Trails, PRow and locally promoted recreational routes/trails. |
| Medium                | Receptors for whom the nature of the view contributes positively to their experience, including travellers on roads where attention is generally less likely to be focused on views and visual amenity, although such views can still be appreciated. May include those engaged in outdoor pursuits such as golf or horse-riding where, although the view is appreciated, the primary focus is the activity itself.                                                                                                                                                    |
| Low                   | Receptors for whom the nature of the view is entirely secondary to their activity or occupation, including people engaged in outdoor sport or recreation which does not involve any appreciation of views; people at their place of work, where the setting is not important to the quality of working life; and travellers where the potentially affected view is incidental to the journey, such as views from main roads.                                                                                                                                           |
| Very low              | Receptors for whom the nature of the view is of very low recognised importance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Impact Magnitude

### Magnitude of Landscape Impacts

- 10.8.23 Paragraph 3.28 of the GLVIA3 notes that the magnitude is informed by combining considerations relating to the scale, extent and duration of impacts.
- 10.8.24 In summarising the magnitude of landscape and seascape impacts in the landscape and visual chapter of the ES, reference will be made to the following:
- Size and scale – the degree to which key characteristics or features identified in the baseline would change.

- Geographical extent – the area over which the change would occur.
- Duration and reversibility – the time over which the change would occur and if these changes are reversible, set out on the following scale: short (weeks); medium (months); and long (years)).

10.8.25 The criteria set out in Table 10-7 will be referred to in determining the magnitude of landscape impacts.

Table 10-7: Magnitude and Nature of Effect on the Landscape and Typical Descriptions

| Magnitude of Landscape and Seascape Effect |            | Typical Description                                                                                                                                                                                                              |
|--------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                                       | Adverse    | Total loss or large-scale damage to existing landscape and seascape character or distinctive features or elements; and/or addition of new uncharacteristic, conspicuous features or elements (i.e. above-ground infrastructure). |
|                                            | Beneficial | Large scale improvement of landscape and seascape character to features and elements; and/or addition of new distinctive features or elements, or removal of conspicuous above ground infrastructure elements.                   |
| Medium                                     | Adverse    | Partial loss or noticeable damage to existing landscape and seascape character or distinctive features or elements; and/or addition of new uncharacteristic, noticeable features or elements (i.e. above-ground infrastructure). |
|                                            | Beneficial | Partial or noticeable improvement of landscape and seascape character by restoration of existing features or elements; or addition of new characteristic features or elements or removal of noticeable features or elements.     |
| Low                                        | Adverse    | Slight loss or damage to existing landscape and seascape character of one (maybe more) key features and elements; and/or addition of new uncharacteristic features and elements.                                                 |
|                                            | Beneficial | Slight improvement of landscape and seascape character by the restoration of one (maybe more) key existing features and elements; and/or the addition of new characteristic features.                                            |
| Very low                                   | Adverse    | Very minor loss, damage, or alteration to existing landscape and seascape character of one or more features and elements.                                                                                                        |

| Magnitude of Landscape and Seascape Effect |            | Typical Description                                                                                                        |
|--------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------|
|                                            | Beneficial | Very minor noticeable improvement of character by the restoration of one or more existing features and elements.           |
| No change                                  |            | No noticeable alteration or improvement, temporary or permanent, of landscape character of existing features and elements. |

### Magnitude of Visual Impacts

- 10.8.26 The magnitude of visual impacts relates to the extent to which the baseline view would change as a result of the Proposed Development. This assessment will be made with reference to the photographs and photomontages from viewpoints.
- 10.8.27 Paragraph 3.28 of the GLVIA3 notes that magnitude is informed by combining a variety of considerations. The assessment of the magnitude of visual effects will be informed by:
- Scale of change.
  - Nature of change.
  - Duration of change.
  - Distance.
  - Screening.
  - Direction and focus of the view.
  - Whether the observed feature is static or moving.
- 10.8.28 The criteria set out in Table 10-8 will be referred to in determining the magnitude of visual impacts.



Table 10-8: Magnitude of Visual Impacts

| Magnitude of Visual Effect | Description                                                                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                       | The Proposed Development, or a part of it, would become the dominant feature or focal point of the view.                                                                                          |
| Medium                     | The Proposed Development, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.                                                      |
| Low                        | The Proposed Development, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.                                       |
| Very low                   | Only a very small part of the Proposed Development's components or activities would be discernible, or being at such a distance it would form a barely noticeable feature or element of the view. |
| No change                  | No part of the Proposed Development's components or activities would be discernible.                                                                                                              |

### Effect Significance

10.8.29 The approach to deriving significance of effect from landscape/visual receptor sensitivity and the magnitude of change, will be based on the significance of effects matrix as shown in Table 10-9. Effects can be adverse or beneficial.

10.8.30 Where two significance categories are included in one cell, a single category will be assigned and an evidence-based reasoned judgement given for the selection of that category. This matrix is to be employed as a guide to understand the process of assessment. Ultimately, the level of assessed effects will be the result of professional judgement and be justified within the assessment.

Table 10-9: Effect Significance

| Magnitude of Impact  |        |           |                     |                   |                   |                   |
|----------------------|--------|-----------|---------------------|-------------------|-------------------|-------------------|
| Receptor sensitivity |        | No change | Very low            | Low               | Medium            | High              |
|                      | High   | Neutral   | Minor               | Minor or Moderate | Moderate or Major | Major             |
|                      | Medium | Neutral   | Negligible or Minor | Minor             | Moderate          | Moderate or Major |



|  | Magnitude of Impact |         |                     |                     |                     |                   |
|--|---------------------|---------|---------------------|---------------------|---------------------|-------------------|
|  | Low                 | Neutral | Negligible or Minor | Negligible or Minor | Minor               | Minor or Moderate |
|  | Very low            | Neutral | Negligible          | Negligible          | Negligible or Minor | Minor             |

10.8.31 Receptors for nighttime assessment will be identified following the assessment of daytime visual effects, based on the criteria set out at paragraph 10.6.4. For nighttime receptors:

- The methodology for the assessment of night-time visual effects will be derived from the methodology used to evaluate the daytime visual effects.
- The assessment of the sensitivity of identified receptors, the magnitude of change in night-time view experienced by those receptors and the significance of effect will be made in the context of, and informed by, the desk-based study and fieldwork undertaken to evaluate the daytime visual effects of the Proposed Development only.

10.8.32 Changes that will be required to the proposed assessment methodology for night-time visual assessment would include:

- Re-classification of the visual sensitivity of receptors to reflect the differences between daytime and night-time sensitivities.
- Re-classification of the magnitude of visual effect descriptors to reflect night-time assessment.

10.8.33 The following definitions would also be introduced in order to describe potential night-time effects of the Proposed Development:

- Sky-glow: the general glow over a populated area as result of light reflecting from objects towards the sky, for example, reduced ability to view the stars in the sky.
- Glare: lighting that is directly orientated towards a receptor, for example vehicular headlights towards a pedestrian. It is the result of a contrast between bright and dark areas within a field of view.
- Ambient Light: general lighting that produces the 'background' illumination of an area (the overall light levels experienced by a receptor).

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## Mitigation and Residual Effects

10.8.34 The landscape and visual chapter of the ES will assess effects both before and after the implementation of mitigation measures, distinguishing between primary, secondary and tertiary mitigation measures. Where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES. Further details are provided in chapter 3 EIA methodology.

## In-combination Effects

10.8.35 Potential in-combination effects include those in relation to landscape, biodiversity, air quality, noise and cultural heritage. In line with the GLVIA3, the assessment of in-combination landscape and visual effects will be proportionate and will focus on likely significant effects.

## Limitations and Assumptions

10.8.36 At this scoping stage, the proposed scope and approach to the assessment in the ES is based on a desk-based study and initial fieldwork carried out in June 2026. Further consultation and engagement, fieldwork and evolution of the design of the Proposed Development will be undertaken to inform the assessment in the ES, which may further refine the proposed scope and approach set out at this scoping stage.

10.8.37 The CPRE mapping of England's light pollution and dark skies is based upon satellite data of sky glow during 2015 and will therefore not necessarily fully represent the current conditions. However, this is considered to be the best available data to inform the assessment in the ES.

10.8.38 Sensitive receptors, including viewpoints, have been limited to publicly accessible areas in accordance with best practice guidance. An assessment of viewpoints from private properties (including residential amenity assessment) will not be carried out.

- 10.8.39 The screening or filtering effect of existing vegetation beyond the proposed Order Limits will be taken into account within the assessment of the Proposed Development's likely significant landscape and visual effects in its current condition. Growth, or other changes to this vegetation, or planting as part of other development, may influence potential effects caused by the Proposed Development, but the management and retention of such vegetation is outside the control of the Applicant and will not therefore be considered in the assessment in the ES.
- 10.8.40 In accordance with paragraph 7.13 of the GLVIA3, *'existing schemes and those which are under construction should be included in the baseline for both landscape and visual effects assessment...'* As such, partially completed development which is observed to be under construction during the fieldwork for the assessment of likely significant landscape and visual effects will be included in the baseline conditions.
- 10.8.41 Any changes to the existing hydrological regime of watercourses during the operational phase of the Proposed Development are not expected to result in likely significant landscape and visual effects on sensitive receptors.

## 10.9 Summary of Impacts and Effects

- 10.9.1 Table 10-10 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the landscape and visual chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 10-10: Summary of Landscape and Visual Scope

| Receptor                                                                                                                                                                                                                                                           | Likely impacts                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Anticipated Magnitude                                         | Anticipated Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                              | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Construction Phase</b>                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                               |                         |                                      |                                                                                                         |                       |
| Designated landscapes within 2km of the Proposed Development's above-ground components and construction compounds: <ul style="list-style-type: none"> <li>The Broads National Park.</li> <li>Suffolk &amp; Essex Coast &amp; Heaths National Landscape.</li> </ul> | Vegetation removal; earthworks/topography change; compounds/plant; haul routes/traffic; open-cut trenching; temporary PRoW diversions; security fencing/hoarding; lighting; temporary stockpiles; noise/movement affecting tranquillity; cumulative effects.; potential effects on special qualities (openness/tranquillity/dark skies) where relevant. Characteristic pattern/vegetation/landform locally affected by working corridor, crossings, and compounds. | Moderate - Major where works occur within or near designation | High                    | Significant                          | CoCP; lighting minimisation; careful siting of compounds; advanced planting; bunding/temporary screens. | Scoped in             |
| Designated landscapes beyond 2km of the Proposed Development's above-ground                                                                                                                                                                                        | Views from beyond 2km not likely to give rise to significant impacts.                                                                                                                                                                                                                                                                                                                                                                                              | Negligible - Low                                              | High                    | Not Significant                      | None required.                                                                                          | Scoped out            |

| Receptor                                                                                                                                                                                                                                                                                                            | Likely impacts                                                                                                                                                                                                                                                                                                                                                                                               | Anticipated Magnitude                              | Anticipated Sensitivity | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                             | Scoped in/ Scoped out |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| components and construction compounds                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                    |                         |                                      |                                                                                                                                                                                                        |                       |
| <p>Local Landscape and Seascape Character Areas within 2km of the Proposed Development's above-ground components and construction compounds located within:</p> <ul style="list-style-type: none"> <li>• South Norfolk District.</li> <li>• The Broads.</li> <li>• Suffolk County.</li> <li>• North Sea.</li> </ul> | <p>Vegetation removal; earthworks/topography change; compounds/plant; haul routes/traffic; open-cut trenching; temporary PRow diversions; security fencing/hoarding; lighting; temporary stockpiles; noise/movement affecting tranquillity; cumulative effects.</p> <p>Impacts to Ancient Woodland, Veteran Trees and trees subject to TPOs beyond 15m from working areas are proposed to be scoped out.</p> | Moderate - Major (location and duration dependent) | Medium - High           | Significant                          | Retain vegetation; CoCP; sensitive lighting; siting of compounds away from receptors; advanced/phased planting; soil bunds/temporary screening; hoarding where helpful; sequence earthworks to screen. | Scoped in             |
| Local Landscape and Seascape Character Areas beyond 2km of the Proposed Development's above-ground                                                                                                                                                                                                                  | Views from beyond 2km not likely to give rise to significant impacts.                                                                                                                                                                                                                                                                                                                                        | Negligible - Low                                   | Medium - High           | Not Significant                      | N/A                                                                                                                                                                                                    | Scoped out            |

| Receptor                                                                                                                                                                                                                                                                                                                                                         | Likely impacts                                                                                                                                  | Anticipated Magnitude                                            | Anticipated Sensitivity                                           | Likely Significance at Scoping Stage | Likely Mitigation Measures                                                       | Scoped in/ Scoped out |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------|-----------------------|
| components and construction compounds                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                 |                                                                  |                                                                   |                                      |                                                                                  |                       |
| Principal visual receptors within 2km of the Proposed Development's above-ground components and construction compounds: <ul style="list-style-type: none"> <li>• Settlements.</li> <li>• Local highway network including National Cycle Routes.</li> <li>• PRow network including long distance footpaths.</li> <li>• Individual dwellings and farms.</li> </ul> | As above plus transitory construction activity in views; potential dominance of cranes/plant locally; increased night-time lighting where used. | Moderate - Major within ~1km; Minor beyond (screening/ distance) | High (residents/ communities, PRow users; roads typically Medium) | Significant                          | As above plus maintain access management for PRow; targeted temporary screening. | Scoped in             |
| Principal visual receptors within 2km of the Proposed Development's above-ground components and construction compounds                                                                                                                                                                                                                                           | Views from beyond 2km not likely to give rise to significant impacts.                                                                           | Negligible - low                                                 | High                                                              | Not Significant                      | None required.                                                                   | Scoped out            |

| Receptor                                                                                                                                                                                                                               | Likely impacts                                                                                                                                                                                                                                                                                                  | Anticipated Magnitude                                                            | Anticipated Sensitivity | Likely Significance at Scoping Stage                               | Likely Mitigation Measures                                       | Scoped in/ Scoped out |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------|------------------------------------------------------------------|-----------------------|
| Night-time visual assessment triggers                                                                                                                                                                                                  | Scoped in for high sensitive receptors within 1km of the Proposed Development's above-ground components and construction compound; and residential receptors within 500m of the Proposed Development's above-ground components and construction compounds where daytime effects are large/very large in Year 1. | —                                                                                | —                       | Potentially Significant for some receptors (to be assessed in ES). | Sensitive/low - spill lighting; directional luminaires.          | Scoped in             |
| <b>Operational Phase</b>                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                 |                                                                                  |                         |                                                                    |                                                                  |                       |
| Designated landscapes within 2km of the Proposed Development's above-ground components <ul style="list-style-type: none"> <li>The Broads National Park.</li> <li>Suffolk &amp; Essex Coast &amp; Heaths National Landscape.</li> </ul> | Permanent above-ground structures; potential perceptual effects on openness/tranquillity.                                                                                                                                                                                                                       | Moderate (reducing with planting) localised to immediate area. Minor by Year 15. | High                    | Significant near features in Year 1; reduced by Year 15.           | Design integration; planting; LEMP in accordance with the OLEMP. | Scoped in             |

| Receptor                                                                                                                                                                                                                                                                  | Likely impacts                                                                                                                                                                                                 | Anticipated Magnitude                        | Anticipated Sensitivity                         | Likely Significance at Scoping Stage                                         | Likely Mitigation Measures                                                | Scoped in/ Scoped out |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------|
| Designated landscapes beyond 2km                                                                                                                                                                                                                                          | Views from beyond 2 km not likely to give rise to significant impacts.                                                                                                                                         | Negligible - Low                             | High                                            | Not Significant                                                              | None required.                                                            | Scoped out            |
| Local Landscape and Seascape Character Areas within 2km of the Proposed Development's above-ground components within: <ul style="list-style-type: none"> <li>• South Norfolk District.</li> <li>• The Broads.</li> <li>• Suffolk County.</li> <li>• North Sea.</li> </ul> | Permanent pattern change (embankments/ easements) with mitigation planting; magnitude reduces by Year 15.<br>Impacts to Ancient Woodland, Veteran Trees and TPOs beyond 15m from working areas are scoped out. | Moderate in Year 1 - Minor by Year 15.       | Medium - High                                   | Likely Significant close to features in Year 1; likely reduction by Year 15. | Planting to BS 4428; maintain LEMP; integrate earthworks.                 | Scoped in             |
| Local Landscape and Seascape Character Areas beyond 2km of the Proposed Development's above-ground components.                                                                                                                                                            | Views from beyond 2km not likely to give rise to significant impacts.                                                                                                                                          | Negligible - Low                             | Medium - High                                   | Not Significant                                                              | None required.                                                            | Scoped out            |
| Principal visual receptors including within 2km of the Proposed Development's above-ground components <ul style="list-style-type: none"> <li>• Settlements.</li> </ul>                                                                                                    | New structures and lighting visible in views; effects reduce with mitigation planting over time although to a lesser                                                                                           | Moderate near features; Minor with distance/ | High (residents/ communities, PRow users; roads | Likely Significant near features in Year 1; reduced by Year 15.              | Siting/design; planting; lighting control; LEMP in accordance with OLEMP. | Scoped in             |



| Receptor                                                                                                                                                                                                   | Likely impacts                                                                                                                                                                                                                                             | Anticipated Magnitude | Anticipated Sensitivity | Likely Significance at Scoping Stage                               | Likely Mitigation Measures                              | Scoped in/ Scoped out |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|--------------------------------------------------------------------|---------------------------------------------------------|-----------------------|
| <ul style="list-style-type: none"> <li>Local highway network including National Cycle Routes.</li> <li>PRoW network including long distance footpaths.</li> <li>Individual dwellings and farms.</li> </ul> | extent at shoreline locations.                                                                                                                                                                                                                             | screening by Year 15. | typically Medium).      |                                                                    |                                                         |                       |
| Principal visual receptors beyond 2km of the Proposed Development's above ground components.                                                                                                               | Views from beyond 2 km not likely to give rise to significant impacts.                                                                                                                                                                                     | Negligible - Low      | High                    | Not Significant                                                    | None required.                                          | Scoped out            |
| Night-time visual assessment triggers.                                                                                                                                                                     | Scoped in for high sensitive receptors within 1km of the Proposed Development's above-ground components; and residential receptors within 500m of the Proposed Development's above-ground components where daytime effects are large/very large in Year 1. | —                     | —                       | Potentially Significant for some receptors (to be assessed in ES). | Sensitive/low - spill lighting; directional luminaires. | Scoped in             |

| Receptor                                                | Likely impacts                                                                                                                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Sensitivity   | Likely Significance at Scoping Stage                               | Likely Mitigation Measures                              | Scoped in/ Scoped out |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------|--------------------------------------------------------------------|---------------------------------------------------------|-----------------------|
| <b>Decommissioning Phase</b>                            |                                                                                                                                                                                                                                                                                                                        |                       |                           |                                                                    |                                                         |                       |
| Designated landscapes/ LCAs/Principal visual receptors. | Effects similar in nature to construction; details to be defined in ES.                                                                                                                                                                                                                                                | Moderate - Major      | As per construction phase | Potentially Significant locally (to be confirmed in ES).           | CoCP; temporary screening; reinstatement.               | Scoped in             |
| Night-time visual assessment triggers.                  | Scoped in for high sensitive receptors within 1km of the Proposed Development's above-ground components and decommissioning compounds; and residential receptors within 500m of the Proposed Development's above-ground components and decommissioning compounds where daytime effects are large/very large in Year 1. | —                     | —                         | Potentially Significant for some receptors (to be assessed in ES). | Sensitive/low - spill lighting; directional luminaires. | Scoped in             |

## 11 Terrestrial Historic Environment

### 11.1 Introduction

11.1.1 This chapter outlines the scope and methodology for the assessment of the potentially likely significant effects arising from the construction, operation and decommissioning of the Proposed Development on the terrestrial historic environment, which comprises built heritage, terrestrial archaeology and the historic landscape character ('HLC') landward of mean high water springs ('MHWS'). All heritage assets seawards of the MHWS are considered in chapter 12 marine historic environment. The assessment will be presented within an Environmental Statement ('ES') submitted with the application for a Development Consent Order ('DCO'). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.

11.1.2 The EIA Scoping Area is shown on Figure 1-1. This chapter should be read in conjunction with the following chapters of this Scoping Report:

- Chapter 2 The Proposed Development.
- Chapter 3 EIA Methodology.
- Chapter 9 Water Environment.
- Chapter 10 Landscape and Visual.
- Chapter 12 Marine Historic Environment.
- Chapter 14 Noise and Vibration.
- Chapter 17 Socio-economics.
- Chapter 19 Ground Conditions.

11.1.3 The assessment will assess the likely significant effects of the Proposed Development on the terrestrial historic environment, which comprises:

- Archaeological remains.
- Built heritage.
- Historic landscapes.

- 11.1.4 These types of receptors are known as heritage assets, which can be either designated or non-designated.
- 11.1.5 This chapter sets out the datasets and resources that will be used to inform the ES, as well as providing an overview of the baseline conditions, the relevant legislation and planning policy, potentially significant effects that might arise from the Proposed Development during its construction, operational and decommissioning phases, and how these will be assessed and mitigated.
- 11.1.6 The lead author of the terrestrial archaeology and built heritage inputs has 19 years' experience in the heritage sector as a field archaeologist and a heritage consultant and is a full Member of the Chartered Institute for Archaeologists (MCIfA). They have extensive experience preparing desk-based assessments, assessing direct and indirect impacts upon all aspects of the historic environment (archaeology, built heritage and historic landscape) and managing large scale archaeological investigations. They have advised on terrestrial archaeology and built heritage in support of nationally significant infrastructure projects ('NSIPs') across a range of sectors and have attended public hearings, including providing evidence at DCO examination.

## 11.2 Study Area

- 11.2.1 The study area relates to the area within which heritage assets (archaeological remains, built heritage, and historic landscapes) may experience effects resulting from the Proposed Development during its construction, operational and/or decommissioning phases. Effects can be direct physical changes to a heritage asset or indirect changes that arise due to changes to an asset's setting or indirect impacts that might have a physical effect to heritage assets, such as alterations to the local hydrology.
- 11.2.2 A study area of between 250m and 500m around a red line boundary is generally deemed robust (as the industry standard) for large linear schemes to provide suitable context and to better understand the potential

significance of archaeological remains and other heritage assets (designated and non-designated) that might be directly impacted by a proposed development and has therefore been applied to the Proposed Development. For the proposed pipeline component sections of the EIA Scoping Area, a 500m radius study area has been used.

- 11.2.3 For non-linear development sites, a 1km radius study area around site boundaries is generally deemed robust (as the industry standard) for identifying heritage assets (designated and non-designated) which could be subject to direct impact. Therefore, a 1km radius study area has been used around the EIA Scoping Area sections for the proposed Central Service Reservoir ('CSR'), proposed Western Service Reservoir ('WSR') and proposed Advanced Water Recycling Plant ('AWRP') components of the Proposed Development to understand the potential and significance of heritage assets that might be impacted by these components.
- 11.2.4 There is no set study area for assessing indirect effects for designated and non-designated heritage assets. A minimum study area of 1km around the proposed CSR, proposed WSR and proposed AWRP components will be used. In paragraph 3.6.1 of National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 106 Cultural Heritage Assessment ('the DMRB LA 106 Guidance'), [1] it is stated that a '*study area should include the settings of any designated or other cultural heritage resource in the footprint of the scheme or within the zone of visual influence or potentially affected by noise*'. Therefore, when a zone of theoretical visibility ('ZTV') and noise model/s are produced, they will be reviewed and any heritage assets (comprising archaeological remains, built heritage and historic landscape) within these considered likely to receive a significant effect resulting from the Proposed Development will be assessed within the ES. Whilst the Design Manual for Roads and Bridges ('DMRB') was prepared for highways schemes, it is a widely adopted methodology for the assessment of impacts upon the historic environment for other types of projects.

- 11.2.5 Heritage assets will be included within the assessment where they are identified as having inter-visibility with the Proposed Development, and/or are located within areas that may be affected by noise and may be significantly affected by the Proposed Development.
- 11.2.6 The study areas described above represent initial, precautionary distances for identifying heritage assets that may be affected by the Proposed Development. These study areas will be reviewed and, where necessary, refined following the preparation of the ZTV mapping, noise modelling and further design development. Any designated or non-designated heritage assets located beyond the initial study areas that are identified as experiencing potential indirect effects to their significance, including through effects to setting, will be included within the assessment reported in the ES.
- 11.2.7 Appendix 11.1 to this chapter sets out the legislation, policy and guidance relevant to the terrestrial historic environment. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

### 11.3 Consultation and Engagement

- 11.3.1 The following consultees have responsibilities relating to the historic environment and will be engaged throughout the EIA process:
- Babergh and Mid Suffolk District Council Conservation Officer.
  - East Suffolk Council Conservation Officer.
  - Great Yarmouth Borough Council Conservation Officer.
  - Historic England ('HE').
  - Norfolk County Council Environmental Services ('NCCES').
  - Suffolk County Council Archaeological Service ('SCCAS').
- 11.3.2 The ES will summarise the outcomes of consultation and engagement with statutory and non-statutory heritage consultees and will identify where agreement has been reached on scope, methodology, mitigation and any scoping out of effects.

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- 11.3.3 Initial engagement has been undertaken with NCCES and SCCAS. These engagements have been to introduce the Proposed Development and to discuss and agree the scope and methodology of the desk-based assessment, including the extent of the study area/s, resources to be consulted and heritage assets that have potential to receive significant effects from the Proposed Development.
- 11.3.4 The scope of geophysical survey has also been discussed at these initial discussions with the aim of starting this survey as soon as reasonably possible. The desk-based assessment and geophysical survey will be carried out in tandem, with engagement required throughout to discuss the results of the assessment and geophysical survey as survey areas are completed to inform the intrusive evaluation strategy.
- 11.3.5 Following completion of the desk-based assessment and evaluation (comprising geophysical survey and trial trenching), further engagement will be carried out to agree a mitigation strategy. Engagement will also be undertaken regarding all ground investigations ('GI') works, to understand whether archaeological and/or geoarchaeological monitoring of boreholes or test pits are required.
- 11.3.6 Engagement has been undertaken with the relevant Local Planning Authorities' Conservation Officers to discuss any impacts (direct and indirect) the Proposed Development may have on heritage assets within their respective administrative areas, such as Grade II listed buildings and conservation areas.
- 11.3.7 As statutory consultee, HE has been consulted to discuss any potential impacts (direct and indirect) that the Proposed Development may have on relevant designated heritage assets, such as Grade I and II\* listed buildings, scheduled monuments, Grade I and II\* registered park and gardens and registered battlefields.
- 11.3.8 Other consultees and stakeholders, such as The Gardens Trust, will be consulted, where required.
-

## 11.4 Baseline Environment

11.4.1 The following assessments and surveys will be prepared/carried out for the Proposed Development and will be used to inform the terrestrial historic environment baseline for the ES.

- Historic Environment Desk-Based Assessment ('HEDBA') – which will include walkover survey, setting assessments, review of aerial photographs and LIDAR.
- Geophysical survey.
- Archaeological and geoarchaeological monitoring of GI test pits and boreholes.
- Trial trenching.

11.4.2 The desk-based assessment will also be used for consultation and engagement with relevant consultees and stakeholders to discuss the scope of the evaluation required to inform the ES and to agree an outline evaluation and mitigation strategy. The results of the evaluation along with the HEDBA will be used to inform the scope and requirement for further specialist evaluation and mitigation.

11.4.3 The following sources will be used within the HEDBA to inform the presence of known heritage assets within the relevant study area:

- National Heritage List for England ('NHLE') for designated heritage assets [2].
- Suffolk Historic Environment Record ('SHER') and Norfolk Historic Environment Record ('NHER') for archaeological sites, events, findspots, historic buildings and HLC data.
- Suffolk Archives, the Norfolk Record Office, and the Genealogist and National Library of Scotland websites for historic mapping.
- Groundsure/Envirocheck mapping for Ordnance Survey ('OS') maps.
- HE's archive in Swindon for aerial photographs and National Mapping Programme ('NMP') data.
- Department for Environment, Food & Rural Affairs' Data Services Platform for LiDAR data [3].
- Portable Antiquities Scheme [4] ('PAS') for information regarding material found and reported by metal detectorists.
- Relevant primary and secondary sources including published and unpublished reports relating to previous archaeological investigations



and ground investigations works considered relevant (obtained from the Archaeology Data Service) [5].

- 11.4.4 Information on designated heritage assets has been obtained from HE's NHLE and is presented in Appendix 11.2. Information on non-designated heritage assets has been obtained from the SHER and NHER and is presented in Appendix 11.3. The locations of designated and non-designated heritage assets are shown on Figures 11-1 to 11-2. Superficial and bedrock geologies are shown on Figure 11-3 and 11-4, respectively. Previous archaeological events, recorded on the SHER and NHER, are shown on Figure 11-5. The baseline conditions described below should be read in conjunction with these figures.
- 11.4.5 The detail provided below presents an initial review of the historic environment resource within the EIA Scoping Area and the surrounding study area. A more detailed assessment will be presented within the HEDBA and the terrestrial historic environment chapter of the ES. Details of the historic environment baseline are provided separately for each component of the Proposed Development's section of the EIA Scoping Area.

## **Proposed Advanced Water Recycling Plant ('AWRP')**

### **Designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.6 There are no scheduled monuments within the proposed AWRP section of the EIA Scoping Area or its study area.

#### *Built Heritage*

- 11.4.7 There are no listed buildings within the proposed AWRP section of the EIA Scoping Area, and it is not situated within a conservation area.
- 11.4.8 There are five listed buildings, comprising two Grade II\* and three Grade II within its 1km study area. The closest Grade II\* building is the Church of St Margaret (NHLE: 1050972) which is located approximately 120m to the northeast of the proposed AWRP section of the EIA Scoping Area, and Old

St Margaret's Church (Grade II\* listed building, NHLE: 1050970) which is located approximately 640m to the northeast. The Grade II listed buildings within the study area comprise Whitehouse Farmhouse (NHLE: 1152277) which is located approximately 580m to the northwest; Lound Hall (NHLE: 1031951) which is located approximately 950m to the southwest; and Hopton Hall (NHLE: 1050971) which is located approximately 1km to the northwest.

### *Historic Landscapes*

- 11.4.9 There are no registered parks and gardens within the proposed AWRP section of the EIA Scoping Area or its study area.

### **Non-designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.10 There are numerous non-designated heritage assets recorded within the proposed AWRP section of the EIA Scoping Area and its 1km study area, largely comprising cropmarks and earthworks recorded in the NHER and SHER.
- 11.4.11 Within the proposed AWRP section of the EIA Scoping Area, cropmarks and earthworks include a possible Bronze Age barrow cemetery (NHER43527) recorded in its northern area. Other cropmarks within the proposed AWRP section of the EIA Scoping Area include possible Roman field systems and trackways (LUD008; COR012), a World War Two naval decoy site (LUD049), multi-phase cropmarks relating to field systems as well as pits and ditches (NHER50982), and undated enclosures (NHER56985), although these have not been subject to archaeological investigation. In addition, the southern part of the proposed AWRP section of the EIA Scoping Area is recorded as historically forming part of the medieval Boyton Common (BOY101).
- 11.4.12 Examples of non-designated heritage assets within the study area around the proposed AWRP section of the EIA Scoping Area include two possible Bronze Age barrow cemeteries (BNL066) to the south which have been

identified from cropmarks and indicate that this section of the EIA Scoping Area is located within a later prehistoric funerary landscape. Many of the remaining non-designated heritage assets recorded by the NHER and SHER relate to further cropmarks and earthworks of as yet undated field systems, enclosures, and trackways, as well as several artefact scatters or isolated findspots dating from the prehistoric to post-medieval periods. There is also further Second World War activity recorded (NHER42486; NHER42491, NHER42487), particularly to the south and east of the proposed AWRP section of the EIA Scoping Area which is associated with Suffolk's coastal defences.

- 11.4.13 The proposed AWRP section of the EIA Scoping Area is previously undeveloped and therefore if archaeological remains are present, they are likely to have survived. This, combined with the cropmarks and earthworks recorded by the NHER and SHER within the proposed AWRP section of the EIA Scoping Area, indicates a high potential for buried archaeological remains to be present.

#### *Built Heritage*

- 11.4.14 There are likely to be non-designated built heritage assets or locally listed buildings within the proposed AWRP section of the EIA Scoping Area and its study area. These will be identified in the HEDBA and assessed within the terrestrial historic environment chapter of the ES.

#### *Historic Landscapes*

- 11.4.15 The HLC within the proposed AWRP section of the EIA Scoping Area is recorded as 20<sup>th</sup> century agriculture within the northern area, and 18<sup>th</sup> century and later enclosure within the southern area. The northern area adjoins horticultural land to the south. A hamlet and farmstead with associated buildings categorised as 'built-up areas' are located to the west and southwest of the proposed AWRP section of the EIA Scoping Area, and modern recreational land is located to the northeast.

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## Proposed Long Sea Outfall ('LSO')

### Designated Heritage Assets

#### *Archaeological Remains*

- 11.4.16 There are no scheduled monuments within the proposed LSO section of the EIA Scoping Area or study area.

#### **Built Heritage**

- 11.4.17 There are no listed buildings within the proposed LSO section of the EIA Scoping Area, and it is not within a conservation area.
- 11.4.18 There are 56 designated built heritage assets within 500m of the proposed LSO section of the EIA Scoping Area, comprising five Grade II\* listed buildings, 50 Grade II listed buildings, and one conservation area.
- 11.4.19 The majority of the listed buildings are situated within, and associated with, the North Lowestoft Conservation Area, which is located approximately 20m west of the proposed LSO section of the EIA Scoping Area. These include 36 High Street (Grade II\* listed building, NHLE: 1292849) which is located approximately 260m to the west of the proposed LSO section of the EIA Scoping Area. The closest listed buildings to the proposed LSO section of the EIA Scoping Area, within this conservation area, are the Maritime Museum (Grade II listed building, NHLE: 1292407), No. 329 Whapload Road (Grade II listed building, NHLE: 1467786), and The Fish House (Grade II listed building, NHLE: 1207049), which are located approximately 150m to the west of the proposed LSO section of the EIA Scoping Area.
- 11.4.20 The Church of St Margaret (NHLE: 1050972) is a Grade II\* listed building located approximately 80m to the east of the proposed LSO section of the EIA Scoping Area. There are three further Grade II\* listed churches in the study area, comprising the Church of St Peter (NHLE: 1208952) which is located approximately 200m to the west, the Church of St Bartholomew (NHLE: 1352637) which is located approximately 210m to the east and Old St Margaret's Church (NHLE: 1050970) which is located approximately

500m to the east of the proposed LSO section of the EIA Scoping Area, respectively.

- 11.4.21 Other Grade II listed buildings within the study area comprise Hillingdon (NHLE: 1208953) located approximately 100m to the south, Whitehouse Farm (NHLE: 1152277) located approximately 250m to the east, Tower Mill (NHLE: 1031938) located approximately 300m to the east, and Gunton Hall (NHLE: 1279910) and associated stables (NHLE: 1210011) located approximately 400m to the west of the proposed LSO section of the EIA Scoping Area, respectively.

#### *Historic Landscapes*

- 11.4.22 There are no registered parks and gardens within the proposed LSO section of the EIA Scoping Area. Belle Vue Park Registered Park and Garden (Grade II listed, NHLE: 1001621) is located within the North Lowestoft Conservation Area, approximately 250m to the west of the proposed LSO section of the EIA Scoping Area.

#### **Non-designated Heritage Assets**

##### *Archaeological Remains*

- 11.4.23 Archaeological remains within the proposed LSO section of the EIA Scoping Area predominantly relate to cropmarks identified during the Lothingland, Lowestoft and North Suffolk Coast and Heaths NMP, the Suffolk Coast and Intertidal Zone NMP and the Norfolk NMP, with the exception of a possible settlement and undated field system identified during a geophysical survey (ESF28686) undertaken in 2023 within the central part of the proposed LSO section of the EIA Scoping Area to the west of Corton. Within the central part of the proposed LSO section of the EIA Scoping Area, there are several cropmark field boundaries and trackways of an unknown date (COR024; COR047; COR058) and artefact scatters dating from the prehistoric to post-medieval periods to the south (LWT159; LWT144) and northwest (COR009) of Corton. Within the northernmost part of the proposed LSO section of the EIA Scoping Area, there are several areas of cropmarks indicating the presence of enclosures, trackways and fields

thought to date from the Bronze Age to the Early Roman periods (NHER43494; NHER43496). To the south of these, cropmarks and earthworks indicating field boundaries, banks and ditches are dated to the post-medieval period (NHER45165). Further evidence of as yet undated cropmarks (NHER50981) is recorded within the northern part of proposed LSO section of the EIA Scoping Area. There are also several artefact scatters (NHER62749) of later prehistoric and early medieval date. The northern part of the proposed LSO section of the EIA Scoping Area was also part of the medieval Boyton Common (BOY101).

- 11.4.24 Non-designated heritage assets within the study area of the proposed LSO section of the EIA Scoping Area include several cropmarks indicating the presence of ring ditches, which are recorded in close proximity to the central and northern parts of the proposed LSO section of the EIA Scoping Area and are likely to represent Bronze Age barrow cemeteries (also discussed within chapter 12 marine historic environment, paragraph 12.4.11). Further assets include large areas of crop mark enclosures and field boundaries, as well as artefact scatters.
- 11.4.25 The SHER records several areas of Second World War features, which encompasses much of the southern and central parts of the proposed LSO section of the EIA Scoping Area. These features include barbed wire obstructions, a barrage balloon site, and a heavy anti-aircraft diver battery (LWT057; LWT090), as well as an extensive anti-tank defensive system (LWT045) that crosses east to west across the central part of the proposed LSO section of the EIA Scoping Area. Second World War coastal defences (consisting of scaffolding) are recorded along the coast (LWT063) immediately east of this section of the EIA Scoping Area.
- 11.4.26 The majority of the proposed LSO section of the EIA Scoping Area is undeveloped and if archaeological remains are present, they are likely to have survived. This, combined with the cropmarks and earthworks recorded by the NHER and SHER within the proposed LSO section of the EIA

Scoping Area, indicates a high potential for buried archaeological remains to be present.

#### *Built Heritage*

- 11.4.27 In addition to the designated built heritage assets, there are also likely to be non-designated built heritage assets or locally listed buildings within the study area, particularly within Lowestoft. These will be identified in the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

#### *Historic Landscapes*

- 11.4.28 The HLC of the proposed LSO section of the EIA Scoping Area is recorded as a mix of 18<sup>th</sup> century enclosure, modern leisure areas and industrial landscapes. The 18<sup>th</sup> century enclosure refers to areas of former common arable land or heathland found within the proposed LSO section of the EIA Scoping Area in Suffolk.

### **Proposed CSR**

#### **Designated Heritage Assets**

##### *Archaeological Remains*

- 11.4.29 There are no scheduled monuments within the proposed CSR section of the EIA Scoping Area or study area.

##### *Built Heritage*

- 11.4.30 There are no listed buildings within the proposed CSR section of the EIA Scoping Area, and it is not located within a conservation area.

- 11.4.31 There is one Grade II\* listed building and six Grade II listed buildings located within 1km of the proposed CSR section of the EIA Scoping Area. The closest is West Cottages (Grade II listed building, NHLE: 1030759), located approximately 10m to the southeast. Heveningham Hall Gate Lodges (Grade II\* listed building, NHLE: 1030800) is located approximately 220m to the west of the proposed CSR section of the EIA Scoping Area. The remaining listed buildings within 1km are Grade II listed and comprise:



- Packway Farmhouse (NHLE 1377345) which is located approximately 160m to the north.
- Threadbare Hall (NHLE: 1377347) which is located approximately 240m to the northwest.
- High House Farmhouse (NHLE: 1198085) which is located approximately 270m to the south.
- Poplar Farmhouse (NHLE: 1284136) which is located approximately 650m to the northeast.
- Earlsway Farmhouse (NHLE: 1198573) which is located approximately 840m to the northeast.

#### *Historic Landscapes*

- 11.4.32 Heveningham Hall (Grade II\* Registered Park and Garden, NHLE: 1000494) is located approximately 200m to the west of the proposed CSR section of the EIA Scoping Area. The main entrance to the park is from the southeast and is marked by Heveningham Hall Gate Lodges (Grade II\* listed, NHLE: 1030800).

#### **Non-designated Heritage Assets**

##### *Archaeological Remains*

- 11.4.33 There are no known archaeological remains within the proposed CSR section of the EIA Scoping Area and there are few known non-designated archaeological remains recorded in the SHER within the study area. The SHER records one intrusive archaeological investigation within the eastern part of the proposed CSR section of the EIA Scoping Area, comprising an archaeological trial trench evaluation (ESF29514). No finds or features are recorded. The SHER records one further intrusive archaeological investigation located within the study area, approximately 180m to the west of the proposed CSR section of the EIA Scoping Area. This comprised archaeological monitoring (ESF22132) undertaken during the construction of a water main between Walpole Water Treatment Works ('WTW') and Lodgewood, during which a Neolithic/Bronze Age flint core and flake were recovered.
- 11.4.34 The remaining non-designated heritage assets recorded by the SHER within 1km of the proposed CSR section of the EIA Scoping Area comprise



two former medieval greens (Sibton Little Green (SBT030) and Sibton Great Green (SBT029), both identified from Hodkinson's map of 1783, around which the hamlet of Sibton developed within the southern part of the study area. A well-preserved Second World War auxiliary unit base (SBT036) is located approximately 500m to the southeast of the proposed CSR section of the EIA Scoping Area. An unnamed outfarm (SBT074) is depicted on 1st edition OS mapping and is also within 1km of the proposed CSR section of the EIA Scoping Area. This has since been demolished and no extant remains of the outfarm are visible today.

- 11.4.35 The proposed CSR section of the EIA Scoping Area has not been subject to previous archaeological investigations. It is previously undeveloped and therefore, if archaeological remains are present, they are likely to have survived.

#### *Built Heritage*

- 11.4.36 There are no non-designated built heritage assets within the proposed CSR section of the EIA Scoping Area. There are farmsteads and outfarms within the 1km study area which may constitute non-designated heritage assets. In addition, there is also the possibility of other non-designated built heritage assets or locally listed buildings within the study area. These will be identified within the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

#### *Historic Landscapes*

- 11.4.37 The HLC of the proposed CSR section of the EIA Scoping Area is recorded predominantly as post-1950s agricultural landscapes, which have formed as a result of historic boundary loss. However, pre-18<sup>th</sup> century enclosures, comprising irregular co-axial fields and a small area of former common pasture, survive immediately to the south of this section.

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## Proposed WSR

### Designated Heritage Assets

#### *Archaeological Remains*

- 11.4.38 There are no scheduled monuments within the proposed WSR section of the EIA Scoping Area. There is one within the 1km study area. This is the moated site immediately southeast of St Mary's Church (NHLE: 1019674) which is located approximately 980m to the west of the proposed WSR section of the EIA Scoping Area.

#### *Built Heritage*

- 11.4.39 There are no listed buildings within the proposed WSR section of the EIA Scoping Area, and it is not situated within a conservation area. A total of 37 listed buildings comprising one Grade I, three Grade II\* and 33 Grade II are located within the 1km study area, of which 14 are located within the Thrandeston Conservation Area.
- 11.4.40 The Thrandeston Conservation Area is located approximately 280m to the west of the proposed WSR section of the EIA Scoping Area and contains one Grade I and eight Grade II listed buildings within the study area. The closest of these is the Church of St Margaret (Grade I listed, NHLE: 1032763) and the associated Three Blackley Monuments (Grade II listed, NHLE: 1182578) and Thrandeston War Memorial (Grade II listed, NHLE: 1458769) which are located within the grounds of the church. These assets are located approximately 290m to the west of the proposed WSR section of the EIA Scoping Area.
- 11.4.41 The two Grade II\* listed buildings within the study area are Park Farmhouse (NHLE: 1032524) which is located approximately 650m to the west and the Church of St Mary (NHLE 1352379) which is located approximately 930m to the west of the proposed WSR section of the EIA Scoping Area, respectively.
- 11.4.42 The remaining Grade II listed buildings are located to the north, east and southeast of the proposed WSR section of the EIA Scoping Area. The

closest are Rose Cottage (NHLE: 1182494), situated adjacent to the north of this section of the EIA Scoping Area and Stone Cottage (NHLE: 1032564), which is located approximately 10m to the east. Others in close proximity include 30 and 32 Eye Road (NHLE: 1352356) which are located approximately 30m to the west; Mill House (NHLE: 1032565) which is located approximately 35m to the south; and Abbey Farm House (NHLE: 1182515) and Wood Hall Manor (NHLE: 1032762) which are both located approximately 45m to the north of the proposed WSR section of the EIA Scoping Area, respectively.

- 11.4.43 Out of the remaining Grade II listed buildings, four are located along Rectory Road, two are located along the A140, three are located to the west of Brome and two are located within the area of Botswold Hall.

### Non-designated Heritage Assets

#### *Archaeological Remains*

- 11.4.44 There is one known non-designated heritage asset within the proposed WSR section of the EIA Scoping Area recorded by the SHER. This is Brome Common (TDE016), a medieval green of which the eastern part of the proposed WSR section of the EIA Scoping Area historically formed a part of. Two former medieval villages, which now form two parts of the village of Thrandeston, centred around associated greens are recorded by the SHER within the study area. These are Thrandeston Great Green (TDE012), which is located to the north of the proposed WSR section of the EIA Scoping Area, and Little Green (TDE013) which is located to the west and within the Thrandeston Conservation Area. Iron Age/Roman settlement activity (YAX040) is recorded to the south and southeast of the proposed WSR section of the EIA Scoping Area within Brome Airfield (EYE072), a former Second World War airfield. The A140 adjacent to this section of the EIA Scoping Area is a former Roman road (BRM011).
- 11.4.45 The proposed WSR section of the EIA Scoping Area has not been subject to previous archaeological investigations. The SHER records several geophysical surveys within the study area, the closest of which is located

immediately to the east of the northern part of the proposed WSR section of the EIA Scoping Area (ESF30894). However, only a limited description of the survey is provided within the SHER. The proposed WSR section of the EIA Scoping Area is previously undeveloped and as such, if archaeological remains are present, they are likely to have survived.

### *Built Heritage*

- 11.4.46 There are no non-designated built heritage assets within the proposed WSR section of the EIA Scoping Area. There are post-medieval farmsteads in the surrounding area which may constitute non-designated built heritage assets. There may also be locally listed buildings within the study area. These will be identified within the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

### *Historic Landscapes*

- 11.4.47 The HLC within the proposed WSR section of the EIA Scoping Area is varied, with a dominant character of pre-18<sup>th</sup> century enclosure comprising irregular co-axial fields. The northern area of this section is recorded as post-1950s agricultural landscapes, which formed as a result of historic boundary loss from the earlier irregular co-axial fields. The eastern area of this section is recorded as 18<sup>th</sup> century enclosure, comprising former common pasture, and disused military landscapes in association with the nearby Brome Airfield.

## **Proposed AWRP to River Waveney Pipeline**

### **Designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.48 There are no scheduled monuments located within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area or the 500m study area.

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*Built Heritage*

- 11.4.49 There are no designated built heritage assets within the proposed AWRP to River Waveney section of the EIA Scoping Area. There are 24 designated built heritage assets within the 500m study area. These comprise one Grade I listed building, three Grade II\* listed buildings and 19 Grade II listed buildings. The closest designated built heritage asset to the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area is Gillingham House (Grade II listed building, NHLE: 1050584), located approximately 60m to the southeast on Rectory Road.
- 11.4.50 The Church of St Mary (Grade I listed building, NHLE: 1251145) is located within the eastern part of the study area, approximately 390m to the east of the proposed AWRP to River Waveney section of the EIA Scoping Area. Of the three Grade II\* listed buildings within the study area, two are located towards the eastern extent of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area. These comprise the Church of St Bartholomew (NHLE: 1352637), situated within Corton and approximately 180m to the east of the proposed AWRP to River Waveney Pipeline section, and the Barn 70m East Northeast of Park Farmhouse (NHLE: 1284051), located approximately 220m to the north of the proposed pipeline section. The barn is associated with Park Farmhouse (Grade II listed building, NHLE: 1352645), which lies immediately west of the barn and approximately 260m to the northwest of this section of the EIA Scoping Area.
- 11.4.51 The remaining Grade II\* listed building (The Elms, NHLE: 1373124) is located approximately 210m to the south of this section of the EIA Scoping Area on Elms Road and is associated with the Barn immediately to the west of the Elms (Grade II listed building, NHLE: 1153703). The barn is located approximately 190m to the south of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area.

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### *Historic Landscapes*

- 11.4.52 There are no registered parks and gardens within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area. Somerleyton Park (Grade II\* listed registered park and garden, NHLE: 1000188) is located approximately 220m to the west of the eastern part of this section. The registered park and garden contains 23 designated built heritage assets, of which one, South Lodge and Gates of Somerleyton (Grade II listed building, NHLE: 1031953), is within the 500m study area.

### **Non-designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.53 Archaeological remains within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area predominantly consist of cropmarks identified from aerial photography. Within the eastern part (located in Suffolk), cropmarks include a possible Bronze Age barrow cemetery (BNL066), approximately 100m to the west of the A47 and possible Roman co-axial field system and enclosures (COR014), immediately to the east of the A47. The SHER records cropmarks extending across a large area between Waddling Lane and approximately 600m to the east of Flixton Road (the B1074) within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area. These include later prehistoric trackways, field boundaries and rectilinear enclosures (BLN003; BNL054; SOL011), alongside extensive, dispersed and potentially multi-phase field systems of unknown date (SOL002; BLN047) situated between Flixton Road and Waddling Lane on either side of the B1074. The proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area also crosses part of the 17<sup>th</sup> century water gardens at Summerhouse Water (SOL027), approximately 360m to the south of the B1074.
- 11.4.54 Similar archaeological remains are recorded within the central part of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area. These comprise cropmarks of possible prehistoric, Roman and medieval to post-medieval field systems and enclosures (NHER44873;

NHER44959; NHER44930). Notably, a possible Roman settlement and associated field system is located within this section of the EIA Scoping Area, approximately 100m to the southwest of Burgh Road (NHER16005).

- 11.4.55 Within the western part of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area, evidence for a probable Roman building (NHER23325) was identified during fieldwalking and observations in a water pipe trench immediately north of Yarmouth Road. Other cropmarks and earthworks in the western part of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area include possible medieval enclosures, trackways, linear ditches and field boundaries.
- 11.4.56 Other non-designated heritage assets within this section of the EIA Scoping Area are a Second World War bombing decoy airfield (NHER13610) recorded directly north of Burgh Road, and the former route of the 1854 East Suffolk Railway (Yarmouth to Beccles) (NHER13574), which is now a private road, and crosses the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area at approximately 60m to the east of Church Lane and approximately 80m to the north of Geldeston Road.
- 11.4.57 There are a large number of non-designated heritage assets recorded by the SHER and NHER within the 500m study area which are of a similar character to those identified within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area. These include continuations of cropmarks that are recorded within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area, such as prehistoric field systems (NHER44873), the site of a possible ring ditch (BLN050), multiphase cropmarks of field boundaries (BLN 054) and medieval and post-medieval field boundaries (e.g. NHER 44877) around Burgh St Peter within the southern part of the study area. Further cropmarks indicating the presence of possible settlements, enclosures and prehistoric, medieval and post-medieval field boundaries are located within the eastern part of the study area.



- 11.4.58 Earthworks of medieval to post-medieval enclosures, field systems and platforms (NHER30620) are visible on aerial photographs within the westernmost part of the study area for the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area. This part of the study area also contains a section of medieval or post-medieval drainage channels (MTT039) visible as earthworks and cropmarks across a large area of Benstead Marshes, located directly south of the River Waveney. Several historic farmsteads are also within study area.
- 11.4.59 There have been limited archaeological investigations within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area, with previous investigations predominantly comprising non-intrusive surveys such as aerial photographic assessments (such as the NMP). This, however, has shown there is a high potential for archaeological remains to be present within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area. Thick alluvial and peat sequences are recorded within the Waveney Valley and as such there is a raised potential for geoarchaeological remains (palaeoenvironmental/waterlogged remains) to be present with this section of the EIA Scoping Area where it crosses the valley. The majority of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area is undeveloped and as such, if archaeological and/ or geoarchaeological remains are present, they are likely to have survived.

#### *Built Heritage*

- 11.4.60 The proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area crosses the Lowestoft to Norwich rail line (LWT353), which is approximately 30m to the northeast of the River Waveney and which is identified as a non-designated built heritage asset by the SHER. The railway is still in use.
- 11.4.61 There is the possibility for locally listed buildings within the study area. All locally listed and non-designated built heritage assets will be identified in



the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

### *Historic Landscapes*

- 11.4.62 The HLC within the proposed AWRP to River Waveney section of the EIA Scoping Area is varied. The eastern area of this section of the EIA Scoping Area from Yarmouth Road to Waddling Lane near Somerleyton is predominantly recorded as 18<sup>th</sup> century enclosure, comprising former common arable or heathland. The rest of this section is predominantly 20<sup>th</sup> century enclosure as a result of historic boundary loss. There is a concentration of land parcels to the south of the River Waveney within this part of the proposed AWRP to River Waveney section of the EIA Scoping Area that are recorded as 17<sup>th</sup> century to 20<sup>th</sup> century inland drained enclosures or grazing marshes. There are also isolated areas of 18<sup>th</sup> to 19<sup>th</sup> piecemeal enclosure, informal post-medieval parkland, and pre-18<sup>th</sup> century enclosure within the western part of this section of the EIA Scoping Area.

## **Proposed Barsham WTW to CSR Pipeline**

### **Designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.63 There are no scheduled monuments within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area. There is one scheduled monument within the 500m study area which is the moated site at Bleach Farm (scheduled monument, NHLE: 1018963). This is located approximately 10m to the west of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and approximately 800m to the east of Wissett.

#### *Built Heritage*

- 11.4.64 There are no designated built heritage assets within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area.
- 11.4.65 There are 71 designated built heritage assets within 500m of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area comprising

seven Grade II\* listed buildings, 62 Grade II listed buildings and two conservation areas. There are 12 listed buildings within 100m of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area, of which two are Grade II\* listed and 10 are Grade II listed. The closest of these to this section of the EIA Scoping Area are Grove Farmhouse (Grade II listed building, NHLE: 1352567) which is approximately 20m to the southwest and Millcroft (Grade II listed building, NHLE: 1199365) which is located approximately 40m to the east, respectively. Bleach House (Grade II listed building, NHLE: 1283533) and associated barn (Grade II listed building, NHLE: 1032062) are situated within the Bleach Farm Scheduled Monument (NHLE: 1018963) and located approximately 50m and 80m to the east of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area, respectively.

11.4.66 The Church of St Peter (Grade II\* listed building, NHLE: 1032046) is located approximately 60m to the southeast of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area. Oak Cottage (Grade II\* listed building, NHLE: 1284147) and the Walpole Old Chapel (Grade II\* listed building, NHLE: 1030448) are located approximately 120m and approximately 190m to the west of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area, respectively. The two remaining Grade II\* listed buildings are located directly north of Halesworth Road, to the west of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area.

11.4.67 A total of 12 Grade II listed buildings located within the Halesworth Conservation Area are within the study area, predominantly situated on Chediston Street to the east of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area. In addition, two Grade II listed buildings within the Wissett Conservation Area are within this section of the EIA Scoping Area, located approximately 320m to the west. The remaining Grade II listed buildings are mostly dispersed farmsteads within the study area. However, there are several clusters of Grade II listed residential

buildings within the village of Walpole in the southern part of the study area and within the village of Ringfield in the northern part of the study area.

### *Historic Landscapes*

- 11.4.68 There are no registered parks and gardens within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area but there is one within the study area. This is Heveningham Hall Registered Park and Garden (Grade II\* listed, NHLE: 1000494) which is located approximately 110m to the west of this section of the EIA Scoping Area. The park is accessed from the southeast with the entrance marked by Heveningham Hall Gate Lodges (Grade II\* listed building, NHLE: 1030800) which are located approximately 240m to the southwest of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area.

### **Non-Designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.69 The proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area contains a small number of archaeological remains recorded within the SHER. The earliest of these is Neolithic findspots (WLP014), identified during archaeological monitoring and recording (ESF20008) between the Walpole WTW and Lodgewood and a Neolithic polished axe head (RGD007) found within the northern part of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area. Further prehistoric activity within this section of the EIA Scoping Area is represented by a cropmark likely to be a Bronze Age ring-ditch (WSS018), approximately 260m to the north of Halesworth Road. The Roman road (ISL007) between Ilketshall St John and Spexhall is on a northwest to southeast alignment crossing the northern part of this section of the EIA Scoping Area. Medieval features (ISL038) were found during an archaeological evaluation (ESF29518) and subsequent excavation (ESF29883) on land west of Halesworth Road, Ilketshall St Lawrence within the central part of this section of the EIA Scoping Area. The central part of the section also crosses an agricultural field that was part of the former 19<sup>th</sup>-20<sup>th</sup> century landscape park (CHD059)

in front of Chediston Hall (which has since been disparked [6]). The remaining heritage assets recorded by the SHER within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area comprise undated cropmarks, an extant earthwork and ancient woodland, all located within the central part of the section.

- 11.4.70 Archaeological remains within the study area are of a similar character to those identified within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area. These comprise possible Bronze Age barrows (BRS007) in the northern part of the study area and later prehistoric remains (HWT072) identified during an archaeological evaluation (ESF26733) carried out west of Halesworth, approximately 200m east of the central part of this section of the EIA Scoping Area. This investigation also identified Roman activity; however, there is little further evidence of Roman activity so far recorded within the study area. The early medieval town of Halesworth (HWT015) is located within the southern part of the study area to the east of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area. A medieval moat (ISL001) and medieval findspots are located within the northern part of the study area. There are several post-medieval farmsteads (e.g. COY029; RGD031) distributed throughout the study area. A number of undated features, including rectangular enclosures (ISL011; SPX006), are also recorded throughout the study area.
- 11.4.71 There have been limited intrusive archaeological investigations within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area. The majority of the land within this section of the EIA Scoping Area is undeveloped, with the exception of the sections that cross roads, and as such, if archaeological remains are present, they are likely to have survived. There is also the potential for deposits of geoarchaeological and palaeoenvironmental interest to be present within this section of the EIA Scoping Area, particularly where it crosses the River Blyth.

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### *Built Heritage*

- 11.4.72 The non-designated built heritage assets recorded within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and the surrounding study area by the SHER predominantly comprise post-medieval farmsteads within the northern and central sections. There is also the possibility of further as yet unidentified built heritage assets or locally listed buildings within the study area. These will be identified within the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

### *Historic Landscapes*

- 11.4.73 The HLC within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area is recorded as a mix of pre-18<sup>th</sup> century enclosure, comprising co-axial field systems, and large areas of post-1950s agricultural landscapes which formed as a result of historic boundary loss.

## **Proposed CSR Pipeline to WSR Pipeline**

### **Designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.74 There are no scheduled monuments within the proposed CSR to WSR Pipeline section of the EIA Scoping Area. There are three within the study area, all of which are medieval moated sites. These comprise the moated site at Grange Farm (NHLE: 1011338) and Moat Farm moated site (NHLE: 1016234) which are located approximately 115m and 150m to the south of the eastern part of the proposed CSR to WSR Pipeline section of the EIA Scoping Area, respectively, and the moated site immediately southeast of St Mary's church (scheduled monument, NHLE: 1019674) which is located approximately 330m to the north of the western extent of this section of the EIA Scoping Area.

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*Built Heritage*

- 11.4.75 There are no designated built heritage assets within the proposed CSR to WSR Pipeline section of the EIA Scoping Area, and it is not located within a conservation area.
- 11.4.76 There are 108 designated built heritage assets within 500m of the proposed CSR to WSR Pipeline section of the EIA Scoping Area, comprising one Grade I listed building, seven Grade II\* listed buildings and 99 Grade II listed buildings, of which 24 are within 50m of this section.
- 11.4.77 There are several isolated moated farm and manor houses within the proposed CSR to WSR Pipeline section of the EIA Scoping Area's study area. These moats are most likely to be of medieval date with the building names such as 'Moat Farm' or 'Moat Farmhouse', reflecting their association with the surviving earthworks. Examples within the study area include Moat Farm (Grade II listed building, NHLE: 1377320), which is situated within Moat Farm moated site (scheduled monument, NHLE: 1016234). This is located approximately 200m to the south of the proposed CSR to WSR Pipeline section of the EIA Scoping Area, and Wilby Hall (Grade II listed building, NHLE: 1352214) which is located approximately 120m north of the central part of the proposed CSR to WSR Pipeline section of the EIA Scoping Area.
- 11.4.78 There are several small villages containing listed buildings within the study area of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. These include the village of Wilby, within which is the Church of St Mary (Grade I listed building, NHLE: 1181714) and six Grade II listed buildings. The closest listed building to this section of the EIA Scoping Area within Wilby is Church Farmhouse (Grade II listed building, NHLE: 1181725), which is a further example of a moated site, located approximately 70m to the south.
- 11.4.79 The village of Horham is located to the north of the western part of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. This village contains the Church of St Mary (Grade II\* listed building, NHLE:

1032540) and a further 13 Grade II listed buildings, arranged along two perpendicular roads. The closest of these to this section of the EIA Scoping Area is Treen (Grade II listed building, NHLE: 1032542) which is located approximately 15m to the northwest.

- 11.4.80 There are two Grade II\* listed buildings and eight Grade II listed buildings within the village of Brome which is towards the western extent of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. Of these, two Grade II listed buildings (30 and 32, Eye Road, NHLE: 1352356; Stone Cottage, NHLE: 1032564) are situated on Eye Road, adjacent to this section.

#### *Historic Landscapes*

- 11.4.81 There are no registered park and gardens within the proposed CSR to WSR Pipeline section of the EIA Scoping Area and one within the study area. This comprises Heveningham Hall (Grade II\* registered park and garden, NHLE: 1000494) which is located directly north of the eastern end of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. The main entrance to the park is from the southeast and is marked by Heveningham Hall Gate Lodges (Grade II\* listed building, NHLE: 1030800) which is located approximately 50m to the north of this section of the EIA Scoping Area.

#### **Non-Designated Heritage Assets**

##### *Archaeological Remains*

- 11.4.82 The SHER records several archaeological remains within the proposed CSR to WSR Pipeline section of the EIA Scoping Area. Evidence for the prehistoric period within this section is represented by isolated finds such as a Neolithic flint axe (HEV007) recorded within the eastern part of this section and an unnamed worked prehistoric object (HRM022) recorded during fieldwalking and monitoring investigation (ESF27405), approximately 340m to the south of Horham in proximity to the River Dove.



- 11.4.83 Evidence for Iron Age and Roman settlement activity (BRM134) was recorded during the archaeological evaluation (ESF26220) in advance of the new Eye Airfield Roundabout (north) on the A140 in the western part of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. The route of a Roman road (HEV009) extends through the eastern section along what is now Heveningham Long Lane. Roman pottery scatters (UBB017; UBB028) are also recorded within the eastern part of the study area, southwest of Heveningham.
- 11.4.84 The former medieval and post-medieval Wilby Green (WBY015) is located directly north of Wilby Lane, within the hamlet of Gibb's Green to the east of Wilby and the medieval green around which the medieval village of Cookley Green (EYE039) developed is within the western part of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. The green appears to have been enclosed by 1837. The former village green around which the medieval village of Brome Common (TDE016) developed is within the western part of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. Undated earthworks (DNN077) have been recorded within the eastern and central parts of the proposed CSR to WSR Pipeline section of the EIA Scoping Area, indicating the presence of archaeological remains such as field systems and enclosures located to the south of Wilby Lane. This section of the EIA Scoping Area crosses various watercourses, such as the River Dove, which have the potential to contain alluvial deposits of archaeological and geoarchaeological interest.
- 11.4.85 Known archaeological remains within the study area are concentrated to the west and southwest of the proposed CSR to WSR Pipeline section of the EIA Scoping Area, most of which are within and around the former Eye Airfield. These remains date from the Mesolithic period through to the Second World War and have been identified predominantly through intrusive investigation. Recorded evidence includes Mesolithic lithics (EYE002; EYE003), Bronze Age burnt mound (YAX040), Iron Age and Roman agricultural activity (BRM134; YAX041), and medieval to post-medieval field systems (EYE201). Evidence for Bronze Age field system, a



burnt mound and Iron Age features (LXD135) were found during an archaeological excavation (ESF30542) southwest of Laxfield, approximately 400m to the north of this section of the EIA Scoping Area. The A140 through Brome also follows the line of a former Roman road (BRM 011) and crosses through the study area.

- 11.4.86 Evidence of Anglo-Saxon and later medieval activity has also been identified through cartographic evidence and fieldwalking, including an Anglo-Saxon cemetery (EYE003) and numerous finds, located approximately 150m to the north of this section of the EIA Scoping Area, west of the River Dove and former medieval village greens, as well as numerous medieval and post-medieval farmsteads.
- 11.4.87 Evidence for Second World War activity includes a rectangular pillbox (DNN053), located on Wilby Lane, and the Second World War Eye Airfield (EYE072) located to the south of Brome. The site of a Second World War military hospital and airfield (HRM012) is located directly north of Horham, approximately 200m to the north of the proposed CSR to WSR Pipeline section of the EIA Scoping Area.
- 11.4.88 Previous archaeological investigations are concentrated within the western part of the proposed CSR to WSR Pipeline section of the EIA Scoping Area, towards Brome. These comprise a programme of geophysical survey (ESF30894) between the River Dove and Nick's Lane, and archaeological monitoring (SHER 26337) undertaken as part of the Yaxley EcoPower investigations. The SHER does not record the results of the geophysical survey. Within the study area, archaeological investigations associated with the former Eye Airfield (ESF26220; ESF23013) have revealed a concentration of activity dating from the prehistoric period onwards within this area, as well as medieval activity, predominantly comprising former medieval commons. The majority of this section of the EIA Scoping Area is undeveloped and as such, if archaeological and/or geoarchaeological remains are present, they are likely to have survived.

### *Built Heritage*

- 11.4.89 Non-designated built heritage assets within the study area include the 1908 Mid-Suffolk Light Railway (SUF076), that extends through the central part of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. There is the possibility for non-designated built heritage and locally listed buildings within the study area. These will be identified within the HEDBA and assessed within the terrestrial historic environment chapter of the ES.

### *Historic Landscapes*

- 11.4.90 The HLC within the proposed CSR to WSR Pipeline section of the EIA Scoping Area is recorded as a mix of pre-18<sup>th</sup> century enclosure, comprising co-axial field systems, and large areas of post-1950s agricultural landscapes which formed as a result of historic boundary loss. There are isolated areas of pre-18<sup>th</sup> century enclosure, meadows/managed wetlands and woodlands within this section.

## **Proposed CSR to Saxmundham Pipeline**

### **Designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.91 There are no scheduled monuments within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. There are three within the study area which are located around Peasenhall. These are all dated to the medieval period and comprise:
- North Grange Moated Site (scheduled monument, NHLE: 1018275) which is located approximately 330m to the west of this section of the EIA Scoping Area.
  - The remains of Sibton Abbey (scheduled monument, NHLE: 1018327) which is located approximately 10m to the west of this section of the EIA Scoping Area.
  - South Grange medieval monastic grange (scheduled monument, NHLE: 1018328) which is located approximately 230m to the south of this section of the EIA Scoping Area.

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*Built Heritage*

- 11.4.92 There are no designated built heritage assets within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area, and it is not located within a conservation area.
- 11.4.93 There are 22 designated heritage assets within the 500m study area. These consist of one Grade I listed building, two Grade II\* listed buildings, 18 Grade II listed buildings and two conservation areas. The majority of listed buildings are dispersed across the study area.
- 11.4.94 The closest designated built heritage assets to the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area are Highhouse Farmhouse (Grade II listed building, NHLE: 1198085) and West Cottages (Grade II listed building, NHLE: 1030759) which are located approximately 10m to the north of this section of the EIA Scoping Area. Others in close proximity include Heveningham Hall Gate Lodge (Grade II\* listed building, NHLE: 1030800) which is located approximately 20m to the west and Pump House (Grade II listed building, NHLE 1284013) which is located approximately 60m to the south of this section, respectively.
- 11.4.95 The Church of St Peter (Grade I listed building, NHLE 1283976) is located on Yoxford Road, approximately 120m to the west of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. A further three Grade II listed buildings are situated on Yoxford Road (Abbey Farmhouse, NHLE: 1198123; Abbots Lodge, NHLE: 1030760; Church Farm Cottages, NHLE: 1030761), both to the east and west of this section of the EIA Scoping Area. Thurstons (Grade II\* listed building, NHLE: 1030649) is located approximately 110m to the east of the proposed CSR to Saxmundham section of the EIA Scoping Area. South Grange (Grade II listed building, NHLE: 1030799) is located within the South Grange medieval monastic grange scheduled monument (NHLE: 1018328), discussed above.
- 11.4.96 The western part of Saxmundham Conservation Area is located approximately 460m to the east of the proposed CSR to Saxmundham
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Pipeline section of the EIA Scoping Area. This contains a high number of listed buildings, the majority of which lie outside of the study area; however, 1-15 Albion Street (Grade II listed building, NHLE: 1268179) is within the study area and is located approximately 450m to the east of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. Similarly, the Peasenhall and Sibton Conservation Area is located approximately 460m to the north of this section of the EIA Scoping Area and contains Grade II\* and Grade II listed buildings situated outside of the study area.

### *Historic Landscapes*

- 11.4.97 There are no registered parks and gardens within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. Heveningham Hall (Grade II\* registered park and garden, NHLE: 1000494) is located within the study area and is directly to the west of this section of the EIA Scoping Area.

### **Non-Designated Heritage Assets**

#### *Archaeological Remains*

- 11.4.98 The proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area contains a limited number of archaeological remains recorded on the SHER which are predominantly around Yoxford Road. These comprise isolated prehistoric findspots, as well as Roman artefact scatters and a section of a Roman road (BDG014) between Coddensham and Peasenhall.
- 11.4.99 The proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area also partly crosses an area recorded by the SHER as a possible post-medieval parkland (SBT018) associated with Sibton Abbey (scheduled monument, NHLE: 1018327). Post-medieval ridge and furrow (BNL010) is recorded within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area at Moss's Covert. Alluvial deposits which may contain palaeoenvironmental/waterlogged archaeological remains are recorded where this section crosses the River Yox.

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- 11.4.100 An archaeological monitoring and recording exercise (ESF18166) was undertaken during construction of the Little Glemham - Benhall - Saxmundham raw water main. Part of this investigation crossed the A12 within the southern part of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. No archaeological features or deposits were recorded.
- 11.4.101 Within the study area, to the east of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area, evidence for prehistoric activity within Saxmundham, includes numerous Neolithic and Bronze Age findspots. These include several Neolithic struck flints (SXM030) recovered during an archaeological evaluation (ESF22221) undertaken in advance of a residential development, located directly east of the A12 on the western extent of Saxmundham. A cluster of possible prehistoric ring-ditches (RMN011; RNM008; RNM009) are visible as cropmarks approximately 400m to the west of the central part of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area at Upper Grove Farm.
- 11.4.102 There is limited evidence for Roman activity recorded by the SHER within the study area for this section of the EIA Scoping Area, which is confined to isolated findspots. An Early to Middle Saxon ditch (SXM034) was recorded during a subsequent phase archaeological evaluation (ESF29195) directly east of the A12. Medieval features are located throughout the study area. These include ponds (KCC021) and earthworks associated with Sibton Abbey (scheduled monument, NHLE: 1018327) and similar features associated with Heveningham Deer Park (HEV008). Benhall medieval Deer Park (BNL019) is located approximately 300m to the south of this section. The deer park continued to be in use into the post-medieval period. The post-medieval period is largely represented by farmsteads and features, comprising quarries, pits, ditches and field enclosures identified during geophysical survey (ESF26590) within the southern part of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area's study area.
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11.4.103 Areas of ancient woodland are also recorded in close proximity to this section of the EIA Scoping Area, such as Spring Wood, located approximately 150m to the east, north of Pump House Lane. The SHER also records several undated cropmarks within the study area. Preserved peat deposits (WSS016) were recorded during an archaeological evaluation (ESF19551) approximately 470m to the southwest of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area.

11.4.104 There has been limited archaeological investigations within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. However, there are known archaeological remains within this section of the EIA Scoping Area, including medieval and potential post-medieval remains associated with Sibton Abbey Scheduled Monument (NHLE: 1018327). The majority of this section of the EIA Scoping Area is undeveloped and as such, if archaeological and/or geoarchaeological remains are present, they are likely to have survived.

#### *Built Heritage*

11.4.105 There is the possibility of non-designated heritage assets and locally listed buildings within the study area. These will be identified within the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

#### *Historic Landscapes*

11.4.106 The HCL within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area is predominantly recorded as pre-18<sup>th</sup> century enclosures, comprising co-axial field systems. There are isolated areas of post-1950s agricultural landscapes (formed through historic boundary loss) and meadow of an unspecified date. The area of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area within Saxmundham is recorded as a 'built-up' town.

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## Proposed Saxmundham to Sizewell C ('SZC') Pipeline

### Designated Heritage Assets

#### *Archaeological Remains*

11.4.107 There are no scheduled monuments within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area. There is one within the study area which is Leiston Abbey (second site) and moated site (scheduled monument, NHLE 1014520). This is approximately 200m to the southwest of this section of the EIA Scoping Area, approximately 1.2km north of Leiston.

#### *Built Heritage*

11.4.108 There are no designated built heritage assets within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area.

11.4.109 There are 50 designated built heritage assets within the study area of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area. These consist of three Grade I listed buildings, four Grade II\* listed buildings, and 42 Grade II listed buildings and one conservation area. Of these, seven listed buildings are within 100m of this section of the EIA Scoping Area.

11.4.110 The closest listed buildings to the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area are towards the eastern part of this section and comprise Upper Abbey Farmhouse (Grade II listed building, NHLE: 1216394) located approximately 25m to the west and the associated barn (Grade II listed building, NHLE: 1216655) which is approximately 40m north of Upper Abbey Farmhouse, and a cottage 450m southwest of Upper Abbey Farmhouse (Grade II listed building, NHLE 1216395), located directly south of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area.

11.4.111 The majority of listed buildings within the study area are within villages. Theberton is located towards the eastern extent of the study area and contains the Church of St Peter (Grade I listed building, NHLE: 1227756)



which is located approximately 420m to the north of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area, and eight Grade II listed buildings. These are mostly located on Leiston Road, to the south and west of the church.

- 11.4.112 The village of Kelsale is located to the south of the western extent of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area. The historic core of this village is designated a conservation area and is entirely within the study area. The northeastern boundary of the conservation area abuts the southern boundary of this section of the EIA Scoping Area. The Church of St Mary and St Peter (Grade I listed building, NHLE 1199020) is within the conservation area and is approximately 170m to the southwest of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area. There are two Grade II\* listed buildings and six Grade II listed buildings. Of these, the Manor House (Grade II listed building, NHLE: 1198842) is the closest to the proposed Saxmundham to SZC section of the EIA Scoping Area and is approximately 90m to the west.
- 11.4.113 There are two other notable concentrations of listed buildings within the study area. The ruins of a medieval abbey, known as St Marys Abbey (Grade I listed building, NHLE: 1215753) is located within Leiston Abbey (scheduled monument, NHLE: 1014520) approximately 310m to the south of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area. The scheduled monument also contains three Grade II Listed buildings of later medieval and post-medieval date (Retreat House, NHLE: 1215754; the Guesten Hall at Abbey Farm, NHLE: 1268290, and barn at Abbey Farm, NHLE: 1216380). The other concentration of listed buildings is around Theberton House (Grade II\* listed building, NHLE: 1228378) which is located approximately 180m to the northeast of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area. The Theberton House estate comprises an additional six Grade II listed buildings.



11.4.114 The remaining listed buildings are mostly dispersed across the study area and comprise isolated farmhouses.

#### *Historic Landscapes*

11.4.115 There are no registered park and gardens within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area or the 500m study area.

#### **Non-Designated Heritage Assets**

##### *Archaeological Remains*

11.4.116 Evidence for archaeological remains recorded on the SHER within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area include a possible barrow (THB004) and other types of landscape features identified from historic OS mapping directly east of Abbey Road, and the remains of a Saxon hearth (KCC010), which was identified during the construction of the A12 bypass.

11.4.117 The eastern part of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area is within the SZC construction footprint and has been subject to extensive archaeological investigations, which are still ongoing. The initial survey comprised a desk-based assessment, aerial photographic search, fieldwalking, test-hole survey, and earthwork survey, followed by geophysical survey (LCS224). Within this area, evidence for archaeological remains includes numerous undated cropmarks (e.g. LCS040) visible from aerial photographs, such as a large, causewayed ring ditch (LCS039), as well as several Neolithic and medieval findspots (e.g. LCS043). While intrusive surveys have been carried out at the SZC construction site (ESF29315), the results are currently unknown but will be included within the HEDBA and the baseline assessment in the terrestrial historic environment chapter of the ES, where available.

11.4.118 Further evidence in the eastern part of the Saxmundham to SZC Pipeline section of the EIA Scoping Area includes undated linear anomalies and

enclosures (THB061) identified approximately 30m to the north of Moat Road, Neolithic findspots, and numerous undated cropmarks.

11.4.119 There was a former medieval deer park located at Theberton (THB014) directly to the north of Moat Road within the central part of the Saxmundham to SZC Pipeline section of the EIA Scoping Area. An unnamed outfarm visible on the 1<sup>st</sup> edition OS mapping sits alongside a private track in an isolated location, located within the western part of this section of the EIA Scoping Area. This has since been demolished and no extant remains of the outfarm are visible today.

11.4.120 Within the 500m study area, there are several artefact scatters or chance finds (KCC008) dating to the Neolithic period which were found during fieldwalking (ESF17129) along the A12. Other features in the study area include as yet undated field systems (LCS028) and possible fish ponds (THB022) to the south of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area. As noted above, archaeological investigations associated with the SZC development have revealed evidence of prehistoric, Roman, and medieval activity within the study area. There are also several former medieval and/or post-medieval parklands and villages that are dated to the medieval period that are situated around greens. Further post-medieval farmsteads are recorded throughout the 500m study area.

11.4.121 Theberton Airfield (THB015), which contains Second World War infrastructure, such as barracks and aircraft hangar is located directly south of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area, to the south of Moat Road. The airfield was constructed in 1934 and returned to agricultural use in 1950. Geophysical survey within the former airfield recorded several anomalies within the study area associated with its former use. Three Second World War airfields, and further Second World War infrastructure are also recorded in the study area.

11.4.122 There have been archaeological investigations carried out within the Saxmundham to SZC Pipeline section of the EIA Scoping Area,

predominately associated with the ongoing SZC construction phase. No further archaeological investigations would be required in those areas where the archaeological resource was mitigated in advance of, or during, the SZC construction activities. The remainder of the proposed Saxmundham to SZC section of the EIA Scoping Area is mostly undeveloped and has been subject to limited previous intrusive investigations. If archaeological remains are present, they are likely to have survived.

### *Built Heritage*

11.4.123 Non-designated built heritage assets within the Saxmundham to SZC Pipeline section of the EIA Scoping Area include the East Suffolk railway line, which opened in 1852 and is still in use.

11.4.124 There is also the possibility of non-designated built heritage assets or locally listed buildings within the study area. These will be identified within the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

### *Historic Landscapes*

11.4.125 The HLC within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area is varied, comprising a mix of pre-18<sup>th</sup> century enclosure, 18<sup>th</sup> century enclosure, and large areas of post-1950s agricultural landscapes. The easternmost area of this section is recorded as modern plantation on former common arable or heathland.

## **Proposed Eastern Distribution Mains**

### **Designated Heritage Assets**

#### *Archaeological Remains*

11.4.126 There are no scheduled monuments within the proposed Eastern Distribution Mains section of the EIA Scoping Area or within the 500m study area.

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*Built Heritage*

- 11.4.127 There are 65 designated built heritage assets within the study area of the proposed Eastern Distribution Mains section of the EIA Scoping Area, comprising two Grade I listed buildings, four Grade II\* listed buildings and 57 Grade II listed buildings and two conservation areas. The southwestern part of the proposed Eastern Distribution Mains section of the EIA Scoping Area is located within the Mellis Conservation Area. However, no listed buildings within the conservation area are within this section of the EIA Scoping Area.
- 11.4.128 The Mellis Conservation Area contains two Grade II\* and 20 Grade II listed buildings, of which two, Bullocks Farmhouse (Grade II listed building; NHLE: 1284794) and the Old Rectory with attached outbuildings (Grade II listed building, NHLE: 1032817) are situated on Earlsfort Road adjacent to the proposed Eastern Distribution Mains section of the EIA Scoping Area.
- 11.4.129 There are several listed buildings to the west of the proposed Eastern Distribution Mains section of the EIA Scoping Area within the Thrandeston Conservation Area, and to the south within Yaxley village. The Thrandeston Conservation Area is located approximately 260m to the west of the proposed Eastern Distribution Mains section of the EIA Scoping Area. There is one Grade I listed building and eight Grade II listed buildings within the conservation area that are also within the study area. The closest of these are the Church of St Margaret (Grade I listed, NHLE: 1032763), as well as the Three Blackley Monuments (Grade II listed, NHLE: 1182578) and the Thrandeston War Memorial (Grade II listed, NHLE: 1458769), both of which are within the church's grounds and approximately 290m to the west of the proposed Eastern Distribution Mains section of the EIA Scoping Area.
- 11.4.130 There are seven listed buildings within the village of Yaxley. These include the Church of St Mary (Grade I listed building, NHLE: 1033114) which is located approximately 310m to the south of the proposed Eastern Distribution Mains section of the EIA Scoping Area and Guildhall Cottage

(Grade II\* listed building, NHLE 1033115) which is located approximately 130m to the south of the Eastern Distribution Mains section of the EIA Scoping Area. The remaining Grade II listed buildings are situated on Old Ipswich Road.

- 11.4.131 Several other Grade II listed buildings are located in close proximity to the proposed Eastern Distribution Mains section of the EIA Scoping Area. These include Home Farm House (NHLE: 1352257) which is located approximately 15m to the south, the moated manor site of Goswold Hall (NHLE: 1032759) and the associated Dovecote (NHLE: 1352255) which are located approximately 20m and 5m from the central part of the proposed Eastern Distribution Mains section of the EIA Scoping Area, respectively, and Red Roofs (NHLE: 1033079) which is located approximately 10m to the north.

#### *Historic Landscapes*

- 11.4.132 There are no registered park and gardens within the proposed Eastern Distribution Mains section of the EIA Scoping Area or within the study area.

#### **Non-designated Heritage Assets**

##### *Archaeological Remains*

- 11.4.133 The SHER records archaeological remains within the southern part of the proposed Eastern Distribution Mains section of the EIA Scoping Area and those parts of this section within the former Eye Airfield (EYE072). Archaeological remains identified represent activity from the Mesolithic period to the Second World War.
- 11.4.134 A geophysical survey (ESF30514) for a proposed gas and electrical connection was carried out within the southern and southeastern parts of the proposed Eastern Distribution Mains section of the EIA Scoping Area, which identified considerable and varied magnetic activity and was followed by a series of archaeological evaluation and mitigation. A late Iron Age to early Roman farmstead (YAX041) was identified during the archaeological evaluation (ESF26032). This evaluation also identified Anglo-Saxon (early

medieval) activity, together with medieval and post-medieval field systems (YAX041). The A140 follows the route of a former Roman road (BRM011) and is aligned northeast to southwest through the eastern part of the proposed Eastern Distribution Mains section of the EIA Scoping Area. Brome Common (TDE016) and Mellis Village Green (MLS011), both former medieval greens, are located within the eastern and southwestern parts of the proposed Eastern Distribution Mains section of the EIA Scoping Area. Several artefact scatters dating from the prehistoric to the medieval period are also recorded within this section of the EIA Scoping Area.

11.4.135 The former Eye Railway Branch (EYE135) is located within the southern part of the proposed Eastern Distribution Mains section of the EIA Scoping Area, south of Mellis Road. It has since been dismantled. The proposed Eastern Distribution Mains section of the EIA Scoping Area also encompasses the western extent of the Second World War Eye Airfield.

11.4.136 There have been a number of archaeological investigations within the former Eye Airfield within the proposed Eastern Distribution Mains section of the EIA Scoping Area and the eastern part of its study area. These comprise a geophysical survey (ESF30514) and several archaeological evaluations (ESF29476; ESF26567; ESF20228) where further evidence of activity dating to the later prehistoric to post-medieval periods was identified. Other archaeological remains recorded within 500m of the proposed Eastern Distribution Mains section of the EIA Scoping Area mostly date to the medieval and post-medieval periods and comprise former medieval greens (TDE012) and a medieval ditch identified during and archaeological monitoring and recording exercise directly south of Mellis Road.

11.4.137 Archaeological investigations within the eastern part of the proposed Eastern Distribution Mains section of the EIA Scoping Area and directly to the south of the proposed Western Distribution Mains section of the EIA Scoping Area have identified evidence for Iron Age and Roman settlement activity, and medieval and post-medieval agricultural activity. With the

exception of the former Eye Airfield, the A140 and residential housing within Finningham, the proposed Western Distribution Mains and Eastern Distribution sections of the EIA Scoping Area are largely undeveloped and as such archaeological remains, if present, will have survived.

### *Built Heritage*

11.4.138 Non-designated built heritage assets within the proposed Eastern Distribution Mains section of the EIA Scoping Area includes a section of the Haughley to Norwich railway line (SHER: 34994), which was built in the 19<sup>th</sup> century. The railway is still in use.

11.4.139 There is the possibility of non-designated built heritage assets and locally listed buildings to be present within the study area of the Eastern Distribution Mains section of the EIA Scoping Area. These will be identified within the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

### *Historic Landscapes*

11.4.140 The HLC within the Eastern Distribution Mains section of the EIA Scoping Area is recorded as a mixture of pre-18<sup>th</sup> century enclosure, characterised by irregular co-axial fields, and 18<sup>th</sup> century and later former common pastures within the northern and western areas. The eastern area is recorded as being part of a disused military landscape associated with the nearby Brome Airfield. The southern area comprises part of post-1950s agricultural landscape resulting from the loss of historic boundaries.

## **Proposed Western Distribution Mains**

### **Designated Heritage Assets**

#### *Archaeological Remains*

11.4.141 There are no scheduled monuments within the proposed Western Distribution Mains section of the EIA Scoping Area or within the 500m study area.

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*Built Heritage*

11.4.142 There are 32 designated built heritage assets within 500m of the proposed Western Distribution Mains section of the EIA Scoping Area. These comprise one Grade I listed building, two Grade II\* listed buildings, 28 Grade II listed buildings, and one conservation area. The central and western parts of the proposed Western Distribution Mains section of the EIA Scoping Area are within the Finningham Conservation Area. No listed buildings within the conservation area are located within this section of the EIA Scoping Area.

11.4.143 The Finningham Conservation Area contains 20 listed buildings within the 500m study area. These comprise the Church of St Bartholomew (Grade I listed building, NHLE: 1352056) which is approximately 100m to the east of the proposed Western Distribution Mains section of the EIA Scoping Area, two Grade II\* listed buildings, and 17 Grade II listed buildings. The closest of these to this section of the EIA Scoping Area comprise The Old Bakery (Grade II listed building, NHLE: 1033147) and Apricot Barn (Grade II listed building, NHLE: 1352079) which are located directly to the south along Gislingham Road. Church Farmhouse (Grade II\* listed building, NHLE 1180529) is located approximately 15m to the west of the proposed Western Distribution Mains section of the EIA Scoping Area.

11.4.144 The remaining listed buildings comprise predominantly of Grade II listed farmhouses and associated barns located to the north, west and southwest of the proposed Western Distribution Mains section of the EIA Scoping Area. Examples within 100m of this section include Red House Farmhouse (NHLE: 1352086), located approximately to the 60m northeast and Green Lane Farm (NHLE 1033149), located approximately 50m to the west of this section of the EIA Scoping Area.

*Historic Landscapes*

11.4.145 There are no registered park and gardens within the proposed Western Distribution Mains section of the EIA Scoping Area or within the 500m study area.



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## Non-Designated Heritage Assets

### *Archaeological Remains*

11.4.146 Early Medieval archaeological remains are recorded in the SHER within the proposed Western Distribution Mains section of the EIA Scoping Area, which consist of two artefact scatters (MSF21227; MSF44706). Several small-scale archaeological investigations are recorded within the 500m study area which have identified archaeological remains. Evidence for Iron Age, Roman and post-medieval activity (COT019) was recorded during an archaeological evaluation (EFS15977) located directly to the south of this section of the EIA Scoping Area. This evaluation was carried out in an area recorded as a possible Anglo-Saxon cemetery (COT015) but no evidence of this was identified during the evaluation and the recorded site may have been mis-located. Further archaeological investigations include an archaeological watching brief (ESF22875) directly to the north of Gislingham Road, which revealed post-medieval pits; and an archaeological evaluation (ESF26623) directly to the south of Westhorpe Road, approximately 270m to the west of the proposed Western Distribution Mains section of the EIA Scoping Area, which identified several undated ditches and pits.

11.4.147 Post-medieval non-designated heritage assets within the 500m study area comprise post-medieval farmsteads (FINN028) and an isolated outfarm (FINN034) within the northern part of the study area for the proposed Western Distribution Mains section of the EIA Scoping Area.

### *Built Heritage*

11.4.148 Non-designated built heritage assets located within the proposed Western Distribution Mains section of the EIA Scoping Area include a section of the Haughley to Norwich railway line (SHER: 34994), which was built in the 19th century. The railway is still in use and runs along (and outside of) the eastern boundary of this section of the EIA Scoping Area.

11.4.149 There is the possibility of non-designated built heritage assets and locally listed buildings to be present within the study area of this section of the EIA

Scoping Area. These will be identified within the HEDBA and assessed in the terrestrial historic environment chapter of the ES.

### *Historic Landscapes*

11.4.150 The HLC within the Western Distribution Mains section of the EIA Scoping Area is predominantly recorded as pre-18th century enclosure, characterised by comprising irregular co-axial fields, with a small area of post-1950s agricultural landscapes at the northeastern area of this section.

## **11.5 Likely Significant Effects**

11.5.1 Whilst the Proposed Development will be designed to limit the impacts upon the historic environment, there is still the potential for direct and indirect effects to occur during its construction, operational and decommissioning phases. The following section outlines the potential sources of impacts and the likely significant effects that may arise during these phases of the Proposed Development. Likely significant effects on buried archaeological remains, built heritage, and HLC that make up the historic environment are considered separately below, reflecting the differing mechanisms by which effects may arise.

### **Construction Phase**

#### **Direct Impacts**

11.5.2 During the construction phase, all intrusive groundworks (such as topsoil removal and deeper excavations for open cut pipe trenching, working easements, construction compounds, access roads, service reservoirs, lagoons, landscaping, utilities diversions etc.) could damage and/or remove buried archaeological remains and deposits of geoarchaeological interest. However, their presence and sensitivity is currently unknown (i.e. it is not currently known without investigation whether buried archaeological remains within the EIA Scoping Area are of such significance to be designated). Where non-designated archaeological remains are determined by the assessment to be of equivalent significance to scheduled monuments, they will be assessed using the policy approach applicable to

designated heritage assets. The removal and damage of buried archaeological and geoarchaeological remains would be permanent and irreversible. Without mitigation in place, this would likely result in significant adverse effects.

- 11.5.3 Construction activities could also result in the removal of sections of ‘important’ historic hedgerows and alterations to the HLC, which could result in a significant adverse effect. Whilst not designated by HE, ‘important’ historic hedgerows are protected under The Hedgerow Regulations 1997 [7] and are considered to have historic interest and contribute towards the legibility of the historic landscape. Hedgerows are protected under these regulations in relation to the historic environment if they are over 30 years old and meet one or more of the criteria outlined in the regulations.

### Indirect Impacts

- 11.5.4 The removal of vegetation and introduction of construction activities, both visually and audibly, may indirectly impact the value of a heritage asset through changes to its setting. This would most likely be temporary and would likely be reversible. However, at this scoping stage, it is considered that this could result in significant adverse effects on designated and non-designated archaeological remains, built heritage and the historic landscape.

## Operational Phase

### Direct Impacts

- 11.5.5 Direct impacts to archaeological remains and palaeoenvironmental deposits will have occurred during the construction phase would have been suitably mitigated prior to or during construction, where needed. Consequently, there would be no residual effects on archaeological remains or palaeoenvironmental deposits during the operational phase. However, the Proposed Development may change the existing flow rate in the River Waveney during the operational phase which has the potential for significant effects on archaeological remains or palaeoenvironmental deposits downstream from the proposed discharge point.

- 11.5.6 Areas of new permanent above ground infrastructure (such as buildings) introduced during the construction phase could result in a significant adverse effect to the HLC. Whilst the pipeline components of the Proposed Development will be reinstated there is the potential for effects to arise from installation of above ground posts or markers from the vegetation removal (until it has been reinstated/re-established). This will be assessed in more detail within the ES chapter.
- 11.5.7 Further assessment will be included within the terrestrial historic environment chapter of the ES to assess the potentially significant direct effects from the future operational maintenance of the Proposed Development.

#### Indirect Impacts

- 11.5.8 During the operational phase of the Proposed Development, where archaeological remains and palaeoenvironmental deposits are to be preserved in situ, any changes to the local hydrology, such as fluctuations to the water table, could affect the conditions necessary for long-term preservation, and as such may cause indirect but physical impacts to the preservation of palaeoenvironmental deposits/remains of archaeological features, which may result in significant adverse effects prior to mitigation.
- 11.5.9 The completed Proposed Development could result in a permanent effect on the value of heritage assets (designated and non-designated) through changes to their setting. This could be as a result of impacts such as the loss of historically associated land, the introduction of modern industrial buildings and structures, and increases in artificial light and noise. This would include any visible alteration to the landscape due to the Proposed Development's above-ground components, such as the proposed WSR and CSR, pumping station at the Lowestoft Water Recycling Centre (a subsidiary component), access roads, and landscaped areas.

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## Decommissioning Phase

- 11.5.10 Where components of the Proposed Development are not left in situ, decommissioning phase effects on the terrestrial historic environment are anticipated to be similar to impacts during the construction phase, with the likely significant effects to be assessed within the terrestrial historic environment chapter of the ES. If the Proposed Development's pipeline components are left in situ, there may be no effects, or these effects may be of lesser magnitude in comparison to the construction phase effects.

### Direct Impacts

- 11.5.11 Whilst it is expected that any direct impacts to buried archaeological remains and deposits of geoarchaeological interest would have been mitigated during the construction phase, any additional intrusive works in unevaluated and unmitigated areas could damage and/or remove buried archaeological remains and deposits of geoarchaeological interest. This impact would be permanent and irreversible. Without mitigation in place, this would likely result in significant adverse effects.
- 11.5.12 Similarly, decommissioning activities could also result in further removal of sections of 'important' historic hedgerows and alterations to the HLC which could result in significant adverse effects.

### Indirect Impacts

- 11.5.13 During the Proposed Development's decommissioning phase, the introduction of decommissioning activities, such as the removal of buildings and structures and vegetation, may both visually and audibly indirectly impact the value of a heritage asset through changes to its setting. This would most likely be temporary and could be reversible. However, at this scoping stage, it is considered that this could result in significant adverse effects on designated and non-designated archaeological remains, built heritage and the historic landscape.

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## 11.6 Impacts Scoped Out of the Assessment

- 11.6.1 At this scoping stage, desk-based assessments (including setting assessments) and geophysical survey have not been completed, and it is unknown whether there are any high value heritage assets within the EIA Scoping Area (or the relevant study areas) that will be directly or indirectly affected by the Proposed Development. Therefore, no elements of the terrestrial historic environment are proposed to be scoped out of the assessment, pending completion of baseline surveys and further engagement with stakeholders.

## 11.7 Proposed Approach to Mitigation

- 11.7.1 The likely mitigation measures that may be used to avoid, reduce or offset likely significant adverse effects are outlined below.

### Primary (Inherent) Mitigation

- 11.7.2 The Proposed Development will be designed to avoid impacts to the historic environment as far as practicable. The results of the archaeological evaluation (geophysical survey and trial trenching) will determine the presence and value of archaeological remains within the Order Limits and inform if avoidance/preservation in situ is required. This would be required should high value archaeological remains (of equivalent significance to scheduled monuments, where the assessment process considers that equivalence to apply) be found. Avoidance techniques may include alterations to sections of the Proposed Development's pipeline components, micro-siting, trenchless technologies or alterations to the footprint of a building or structure.
- 11.7.3 With regard to indirect effects upon the setting of heritage assets, primary mitigation may involve specific design requirements. For designated heritage assets and non-designated heritage assets, this may include re-positioning access roads to avoid historic entranceways and views; adjusting building heights/layouts to minimise visual impacts; using building

materials appropriate to the historic character of the area or to maintain historic architectural cohesion; and use of sensitive lighting.

### Secondary (Foreseeable) Mitigation

- 11.7.4 Where impacts upon archaeological remains cannot be avoided or where remains are identified that do not warrant avoidance/preservation, then mitigation by record would be required. This could include open area excavation, 'strip, map, and sample' excavation (which would involve mechanically stripping topsoil/subsoil/overburden over a large area, mapping archaeological features and sampling a selection of the features), geoarchaeological and palaeoenvironmental investigations and/or archaeological monitoring and recording.
- 11.7.5 If preservation in situ is required, this will follow guidance as outlined by HE [8]. Where archaeological remains are of sufficient value to warrant preservation in situ, a hydrological assessment may be needed to understand local hydrology and if any changes from the Proposed Development to the hydrology may have an impact on palaeoenvironmental deposits / remains or any other archaeological features.
- 11.7.6 Secondary mitigation may also include reinstating historic hedgerows/field boundaries in accordance with landscape and biodiversity strategies. Mitigation may also include the creation of effective long-term visual or acoustic screening (e.g. vegetation, fencing) where the design of the Proposed Development cannot be altered to mitigate or remove impacts to the setting (visual and audible) of heritage assets (both designated and non-designated). Screening must be subject to careful design, including permanence and longevity (i.e. securing management measures for vegetation), as it may itself result in a further impact to the setting of the heritage asset [9].

### Tertiary (Inexorable) Mitigation

- 11.7.7 The implementation of measures set out in a Construction Environmental Management Plan ('CEMP'), in accordance with the Outline Construction

Environmental Management Plan ('OCEMP') to be submitted with the DCO application, would help to minimise potentially significant effects upon heritage assets. These measures would include but are not limited to: minimising visual intrusion through the use of fencing which would help to reduce the visibility of construction activities; implementation of considerate construction practices including site hoarding and tidy working methods and control of access routes, materials storage and compound locations to avoid unnecessary encroachment on, or near to, sensitive heritage assets.

## **11.8 Proposed Approach to the ES**

### **Assessment Methodology**

- 11.8.1 The HEDBA and archaeological evaluation will be used to inform the terrestrial historic environment baseline for the assessment in the ES, which will include a proportionate description of the significance of the heritage assets impacted by the Proposed Development and the contribution of their setting to that significance. This will take the form of a setting assessment which will explicitly describe the contribution setting makes to the significance of each heritage asset (i.e. through historic association and or how the asset is experienced within its setting) and assess how the Proposed Development would alter that contribution, in line with the National Policy Statement for Water Resources Infrastructure (2023) [10] ('NPSWRI'), Chartered Institute for Archaeology [11] ('CIfA') guidance and HE [12] guidance. This will be used for engagement with relevant stakeholders to discuss the need for further specialist evaluation and agree mitigation strategies which will be set out within the ES. The HEDBA will use the agreed study areas following engagement with the SCCAS and NCCES. In accordance with paragraph 3.6.1 of the DMRB LA 106 Guidance, any designated heritage assets within the zone of visual influence (assessed as the ZTV) or that may be affected by noise which are located beyond this standardised area will also be included. To demonstrate a clear understanding and assessment of the impact the Proposed Development could have to the significance of the heritage assets, a full range of sources (refer to Section 11.4) including the NPSWRI, CIfA



guidance and HE guidance as well as walkover surveys will be used to inform the HEDBA.

- 11.8.2 Where there is archaeological potential, a field evaluation will include geophysical survey followed by archaeological trial trenching in order to confirm the presence (or absence) and significance of any archaeological remains, in accordance with the NPSWRI. The exact scope of the evaluation will be subject to engagement with SCCAS and NCCES. The results of the HEDBA and the evaluation will inform the requirement and scope of further specialist evaluation and mitigation measures such as hedgerow recording, geoarchaeological and palaeoenvironmental investigations, assessment and analysis, and historic buildings recording. All archaeological investigations will also be subject to ongoing, findings led, engagement with SCCAS, NCCES and HE, as relevant/appropriate. The results of the required pre-determination surveys and investigations will inform the assessment in the ES.
- 11.8.3 The assessment methodology detailed below will be used to assess impacts and effects upon heritage assets within the ES and is in accordance with criteria set out in National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 104 Environmental Assessment and Monitoring (2020) [13] ('the DMRB LA 104 Guidance'). Whilst the DMRB LA 104 Guidance was published to inform the assessment of highways schemes, it is a widely adopted methodology for assessing impacts on the historic environment for all types of projects, including of the scale, size and nature of the Proposed Development. It is considered to comprise best practice guidance for the assessment of likely significant effects on the terrestrial historic environment from the Proposed Development.

### Value of Receptors

- 11.8.4 The value of heritage assets will be assessed on the basis of existing designations (such as scheduled monuments and listed buildings) but where features are found which do not have any formal national or local

designation (non-designated heritage assets) a ‘cautious ‘worst case’ approach’ will be used in accordance with the Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026) [14]. The value of heritage assets is assessed on a five-point scale of, very high, high, medium, low and negligible. The criteria that will be used to assess the value of assets is presented in Table 11-1 and follows Table 3.2N in the DMRB LA 104 Guidance.

Table 11-1: Value Criteria

| Value of Heritage Asset | Typical Description                                                                               |
|-------------------------|---------------------------------------------------------------------------------------------------|
| Very High               | Very high importance and rarity, international scale and very limited potential for substitution. |
| High                    | High importance and rarity, national scale, and limited potential for substitution.               |
| Medium                  | Medium or high importance and rarity, regional scale, limited potential for substitution.         |
| Low                     | Low or medium importance and rarity, local scale.                                                 |
| Negligible              | Very low importance and rarity, local scale.                                                      |

## Magnitude of Impact

- 11.8.5 Magnitude of impact is the degree of change that would be experienced by a heritage asset and its setting during the construction, operational and decommissioning phases of the Proposed Development. The magnitude of impact is assessed without reference to the value of the heritage asset and could include physical impacts or impacts on its setting.
- 11.8.6 Effects may be temporary or permanent, direct or indirect and may be adverse, beneficial or may result in no change. The magnitude of impact will be assessed using a five-point scale of, major, moderate, minor, negligible and no change. The assessment is based on professional judgement and follows criteria provided in the DMRB LA 104 Guidance. Factors in the assessment of the magnitude of impact for all heritage assets are presented in Table 11-2.

Table 11-2: Magnitude of Impact Criteria

| Magnitude of Impact (Change) |            | Typical Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Major                        | Adverse    | <p>Change to most or all key archaeological materials, such that the resource is totally altered. Comprehensive changes to setting.</p> <p>Change to key historic building elements, such that the resource is totally altered. Comprehensive changes to setting.</p> <p>Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit.</p>                                                                                                                                   |
|                              | Beneficial | Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Moderate                     | Adverse    | <p>Changes to many key archaeological materials, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset.</p> <p>Change to many key historic building elements, such that the resource is significantly modified. Changes to the setting of an historic building, such that it is significantly modified.</p> <p>Changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to historic landscape character.</p> |
|                              | Beneficial | Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Minor                        | Adverse    | <p>Changes to key archaeological materials, such that the asset is slightly altered. Slight changes to setting.</p> <p>Change to key historic building elements, such that the asset is slightly different. Change to setting of an historic building, such that it is noticeably changed.</p> <p>Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access resulting in limited changes to historic landscape character</p>                                                                                  |
|                              | Beneficial | Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Magnitude of Impact (Change) |            | Typical Description                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |            | impact on attribute or a reduced risk of negative impact occurring.                                                                                                                                                                                                                                                                                                                                                              |
| Negligible                   | Adverse    | Very minor changes to archaeological materials or setting.<br>Slight changes to historic buildings elements or setting that hardly affect it.<br>Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character. |
|                              | Beneficial | Very minor benefit to or positive addition of one or more characteristics, features or elements.                                                                                                                                                                                                                                                                                                                                 |
| No Change                    |            | No loss or alteration of characteristics, features or elements; no observable impact in either direction.                                                                                                                                                                                                                                                                                                                        |

## Significance of Effect

- 11.8.7 The significance of effect upon heritage assets will be determined as a combination of the assessment of the value of the asset and the magnitude of impact. This is achieved using professional judgement informed by the matrix (taken from the DMRB LA 104 Guidance), shown below in Table 11-3.
- 11.8.8 Five levels of significance (very large, large, moderate, slight or neutral) are defined which apply equally to adverse and beneficial effects. Where two levels of significance of impact are given in the table (for example, neutral or slight), evidence will be provided to support the assessment of a single significance category. A significance of effect of moderate or above would be considered to be a material decision making factor is therefore taken to be significant.

Table 11-3: Matrix for Assessing Significance

|                         |            | Magnitude of Impact (Change) |                   |                    |                     |                     |
|-------------------------|------------|------------------------------|-------------------|--------------------|---------------------|---------------------|
|                         |            | No Change                    | Negligible        | Minor              | Moderate            | Major               |
| Value of Heritage Asset | Very High  | Neutral                      | Slight            | Moderate or Large  | Large or Very Large | Very Large          |
|                         | High       | Neutral                      | Slight            | Slight or Moderate | Moderate or Large   | Large or Very Large |
|                         | Medium     | Neutral                      | Neutral or Slight | Slight             | Moderate            | Moderate or Large   |
|                         | Low        | Neutral                      | Neutral or Slight | Neutral or Slight  | Slight              | Slight or Moderate  |
|                         | Negligible | Neutral                      | Neutral           | Neutral or Slight  | Neutral or Slight   | Slight              |

### Mitigation and Residual Effects

11.8.9 Baseline data gathered from desktop surveys, geophysical surveys and trial trenching will be used to inform decision-making.

11.8.10 The terrestrial historic environment chapter of the ES will assess effects both before and after the implementation of mitigation measures:

- Pre-mitigation effects (or 'unmitigated effects'): effects that would occur in the absence of any mitigation.
- Residual effects: effects that remain after the implementation of mitigation measures (primary, secondary, and tertiary), representing the 'cautious 'worst case'' outcome.

11.8.11 As set out in Section 11.7 above, the assessment will distinguish between:

- Primary (inherent) mitigation: design features integrated into the Proposed Development, such as micro-siting and route refinement options. Archaeological evaluation (geophysical survey and trial trenching) and geoarchaeological investigations (purposive test pitting and boreholes) carried out prior to preparation of the ES will be used to determine the presence and value of archaeological and palaeoenvironmental remains. Where nationally important remains are identified that require preservation in situ, primary mitigation involve avoidance. The siting of above ground components along with the

height, scale, massing, materials, lighting etc will be designed to avoid/limit indirect impacts upon the setting of heritage assets.

- Secondary (foreseeable) mitigation: measures designed to reduce likely significant effects. Archaeological mitigation could include preservation by record in the form of 'strip, map, and sample' excavation with full analysis of findings (soil samples, human remains etc); archaeological monitoring during construction; more in-depth palaeoenvironmental and geoarchaeological investigations, such as targeted boreholes for geoarchaeological purposes and full analysis of geoarchaeological samples. Historic building surveys may be carried out to mitigate direct significant effects on built heritage. Historic landscape surveys targeting earthworks and landscape features, as well as reinstating historic hedgerows/field boundaries in accordance with landscape and biodiversity strategies may be carried out to reduce direct significant effects to historic landscapes.
- Tertiary (inexorable) mitigation: measures required by legislation, policy, or standard best practice. Examples of tertiary mitigation to protect archaeological and palaeoenvironmental remains would be to ensure construction works are conducted in the parameters of the agreed scope and design. For built heritage and historic landscapes, measures would include but are not limited to minimising visual intrusion through fencing; having dedicated storage and compound areas where their location in regard to operational impacts would be reviewed in the ES and implementing considerate construction practices (such as tidy working methods and controlled access routes).

11.8.12 Where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES.

### **In-combination Effects**

11.8.13 In-combination effects due to a proposed development are the combined effects that occur from multiple environmental impacts. These effects could result in cumulative effects to the historic environment. While these effects may not be considered significant in isolation, when combined, they could result in a significant effect to a heritage asset. Examples of in-combination effects may include:

- The combination of terrestrial biodiversity and historic landscape character where a historic hedgerow may be considered of low historic value, and does not meaningfully contribute to the significance of the historic landscape character of an area but is considered to be of high

ecological value due to its age and biodiversity, where its loss could cause significant adverse effects prior to mitigation through conservation

- The combination of socio-economics and the historic environment where heritage plays a key role in the tourism and socio-economics of an area. Changes to this may result in a decline to the socio-economic value and growth of an area.

11.8.14 As set out in chapter 3 EIA methodology, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within, the cumulative effects assessment chapter of the ES.

### Limitations and Assumptions

11.8.15 The assessment of effects on marine archaeology is set out in chapter 12 marine historic environment of this Scoping Report.

11.8.16 Prior to the findings of the desk-based assessment and archaeological evaluation, it is not possible to determine whether the EIA Scoping Area contains any high value heritage assets (i.e. scheduled monuments or assets of equal value to a scheduled monument).

11.8.17 The study area in respect of potential impacts resulting from changes to the existing flow of the River Waveney during the Proposed Development's operational phase will be informed by hydrological modelling. This will identify whether any likely significant effects could occur on archaeological remains or palaeoenvironmental deposits. The study area (shown on Figure 11-1) would be extended, where modelling demonstrates that hydrological pathways occur.

11.8.18 Therefore, adopting a precautionary approach, it has been assumed that any direct and indirect impacts would result in significant adverse effects upon heritage assets.

## 11.9 Summary of Impacts and Effects

11.9.1 Table 11-4 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the terrestrial

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historic environment chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.



Table 11-4: Summary of Terrestrial Historic Environment Scope

| Receptor (Heritage Asset)                                    | Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Anticipated Magnitude | Anticipated Importance/Value | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                         | Scoped in/Scoped out |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Construction Phase</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                              |                                                |                                                                                                                                                                                                                                                                                    |                      |
| Archaeology (archaeological and palaeoenvironmental remains) | <p>All intrusive groundworks have the potential to damage, and or remove buried archaeological remains and deposits of geoarchaeological interest (palaeoenvironmental). Effect would be permanent and irreversible.</p> <p>There could be indirect effects to the setting of archaeological remains through change to their setting arising from introduction of plant, machinery and construction activities and increases in noise, light and construction traffic.</p> | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage but will involve avoidance/ preservation in situ or preservation by record ('strip, map and sample' excavation, archaeological monitoring etc). Measures set out in a Construction Environmental Management Plan in accordance with the OCEMP. | Scoped in            |
| Built Heritage                                               | Unlikely to receive direct impacts from the Proposed Development. However, there could be indirect effects to the setting of built heritage through change to their setting arising from introduction of plant, machinery and construction activities and increases in noise, light and construction traffic.                                                                                                                                                              | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage but likely to involve avoidance and other design mitigation as part of the Proposed Development. Measures set out in a Construction Environmental Management Plan in accordance with the OCEMP.                                                | Scoped in            |
| Historic Landscape                                           | Direct and indirect impacts on character of historic landscape.                                                                                                                                                                                                                                                                                                                                                                                                            | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage.                                                                                                                                                                                                                                               | Scoped in            |

| Receptor (Heritage Asset)                                    | Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Anticipated Magnitude | Anticipated Importance/Value | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                    | Scoped in/Scoped out |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Operational Phase</b>                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |                              |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      |
| Archaeology (archaeological and palaeoenvironmental remains) | <p>Direct impacts would have occurred during the construction phase.</p> <p>Further assessment will be needed on likely indirect impacts to archaeology during operation (for example from dewater or changes in local hydrology). There could also be indirect effects to the setting of archaeological remains through change to their setting arising from introduction of the proposed service reservoirs and permanent infrastructure such as the proposed AWRP.</p> | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage but where hydrological assessment is carried out (refer to chapter 9 water environment) and conclude changes to the water table, further, more detailed assessment may be needed to determine the level of impact local hydrological changes may have upon the preservation of archaeological and palaeoenvironmental deposits. This would be carried as part of the ES and to inform design of the Proposed Development. | Scoped in            |
| Built Heritage                                               | Indirect impacts to value and significance of built heritage through changes to their setting resulting from the introduction of the proposed reservoirs and permanent infrastructure such as the proposed AWRP.                                                                                                                                                                                                                                                          | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage.                                                                                                                                                                                                                                                                                                                                                                                                                          | Scoped in            |
| Historic Landscape                                           | Indirect impacts on significance of the historic landscape character and assets through changes to their setting resulting from the introduction of the proposed WSR, CSR AWRP.                                                                                                                                                                                                                                                                                           | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage.                                                                                                                                                                                                                                                                                                                                                                                                                          | Scoped in            |

| Receptor (Heritage Asset)                                    | Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Anticipated Magnitude | Anticipated Importance/Value | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                              | Scoped in/Scoped out |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Decommissioning Phase</b>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |                              |                                                |                                                                                                                                                                                                                                                                                                                                         |                      |
| Archaeology (archaeological and palaeoenvironmental remains) | Decommissioning will be similar to construction. Any areas of groundworks not previously impacted and/or mitigated will have the potential to damage, and or remove buried archaeological remains and deposits of geoarchaeological interest (palaeoenvironmental). Effect would be permanent and irreversible.<br><br>There could be indirect effects to the setting of archaeological remains through change to their setting arising from introduction of plant, machinery and construction activities and increases in noise, light and construction traffic. | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage but will involve avoidance/ preservation in-situ or preservation by record ('strip, map and sample' excavation, archaeological monitoring etc), sensitive design and construction practices, and measures outlined in a Decommissioning Environmental Management Plan in accordance with the ODEMP. | Scoped in            |
| Built Heritage                                               | Unlikely to receive direct impacts from the Proposed Development. However, there could be indirect effects to the setting of built heritage assets through change to their setting arising from introduction of plant, machinery and construction activities and increases in noise, light and construction traffic.                                                                                                                                                                                                                                              | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage but likely to involve avoidance and other design mitigation as part of the Proposed Development, and measures set out in a Decommissioning Environmental Management Plan in accordance with the ODEMP.                                                                                              | Scoped in            |
| Historic Landscape                                           | Direct and indirect impacts on character of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Negligible to Major   | Negligible to High           | Significant                                    | Not yet known at this scoping stage.                                                                                                                                                                                                                                                                                                    | Scoped in            |

| Receptor (Heritage Asset) | Effects                                             | Anticipated Magnitude | Anticipated Importance/Value | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|---------------------------|-----------------------------------------------------|-----------------------|------------------------------|------------------------------------------------|----------------------------|----------------------|
|                           | historic landscape and historic landscape features. |                       |                              |                                                |                            |                      |

## 12 Marine Historic Environment

### 12.1 Introduction

- 12.1.1 This chapter of the Scoping Report outlines the proposed scope and methodology for the assessment of the potentially likely significant effects arising from the construction, operation and decommissioning of the Proposed Development on the marine historic environment. This assessment will include all historic environment receptors seawards of mean high water springs ('MHWS'). All historic environment receptors landwards of MHWS are considered within chapter 11 terrestrial historic environment of the Scoping Report.
- 12.1.2 The Environmental Impact Assessment ('EIA') Scoping Area is shown on Figure 1-1. This chapter should be read in conjunction with the following chapters of this Scoping Report:
- Chapter 2 The Proposed Development.
  - Chapter 3 EIA Methodology.
  - Chapter 9 Water Environment.
  - Chapter 10 Landscape and Visual.
  - Chapter 11 Terrestrial Historic Environment.
  - Chapter 23 Cumulative Effects Assessment.
- 12.1.3 The proposed scope of the assessment of the Proposed Development's likely significant effects on the marine historic environment specifically relates only to 'Option 1' for the Proposed Development in the Long Sea Outfall ('LSO') section of the EIA Scoping Area. This option proposes construction of a new seabed pipeline which would discharge concentrated residual water ('CRW') from the Proposed Development's Advanced Water Recycling Plant ('AWRP') offshore via a diffuser.
- 12.1.4 The other 'options' for the Proposed Development in the proposed LSO section of the EIA Scoping Area would discharge CRW via the existing Anglian Water outfall at Ness Point, Lowestoft. These options comprise 'Option 2', which is a proposed new connection to the existing Anglian

Water outfall network at the existing Lowestoft Water Recycling Centre ('WRC') and 'Option 3', which is a proposed new pipeline from the proposed AWRP to the existing Ness Point outfall. Neither option requires provision of new seabed infrastructure seawards of MHWS. Moreover, the diversion of effluent from the existing WRC to the proposed AWRP would result in reduced offshore discharge via the existing Ness Point outfall compared to the present situation. At this scoping stage, Options 2 and 3 are therefore unlikely to have any significant effects on the marine historic environment and are accordingly scoped out of the proposed assessment. However, should either option be incorporated into the design of the Proposed Development as it evolves, and should further design development identify a requirement for construction works seawards of MHWS with the potential to affect marine historic environment receptors, the potential for likely significant marine historic environment effects would be reviewed and, if these are identified, scope into the assessment in the ES.

12.1.5 The marine historic environment is defined in the UK Marine Policy Statement ('MPS') [1] as all aspects of the environment resulting from the interaction between people and places through time. For the purposes of the assessment, this includes, but is not limited to:

- Submerged palaeo-landscapes.
- Historic seascapes.
- Marine and intertidal archaeology.

12.1.6 Individual elements of these topics (submerged palaeo-landscapes, historic seascapes and marine and intertidal archaeology) are known as heritage assets, which can be either designated or non-designated. For the purposes of the assessment, 'marine heritage assets' will comprise all heritage assets located seawards of MHWS.

12.1.7 This chapter sets out the datasets and resources that will be used to inform the assessment in the marine historic environment chapter of the ES, as well as providing an overview of the baseline conditions, the relevant legislation and planning policy (refer to Appendix 12.1), the potentially

significant effects that might arise from the Proposed Development during its construction, operational and decommissioning phases, and how these will be assessed and mitigated.

- 12.1.8 This marine historic environment assessment will be undertaken by suitably qualified marine archaeology specialists. Between them, they have over 40 years' collective experience in the commercial and research sectors and have provided marine archaeological support to numerous infrastructure developments in UK waters, including for nationally significant infrastructure projects ('NSIPs'). All assessors are Members of the Chartered Institute for Archaeologists.

## 12.2 Study Area

- 12.2.1 The study area relates to the area within which marine heritage assets may experience likely significant effects as a result of the Proposed Development during its construction, operational and decommissioning phases. This area is relevant only to Option 1 of the proposed LSO component of the Proposed Development, as it is the only option (and component) under consideration for offshore discharge of CRW which requires construction of new infrastructure seaward of MHWS. Options 2 and 3, by contrast, require only works landwards of MHWS to connect to the existing discharge network at the Lowestoft WRC and Ness Point outfall respectively, whilst offshore discharge also is likely to be reduced compared to the present situation as a result of diversion of wastewater to the proposed AWRP. Should Option 2 or Option 3 be progressed and marine construction works seawards of MHWS be required, an appropriate marine historic environment study area would be established around the Ness Point outfall and any associated offshore works.
- 12.2.2 The proposed LSO section of the EIA Scoping Area extends from the shore at Hopton-on-Sea to a distance of approximately 1.2km offshore. The location of the study area for the assessment comprises the EIA Scoping Area seawards of MHWS, plus a marine radius of 1km outwards from the EIA Scoping Area boundary. Both the EIA Scoping Area and 1km marine

radius exclude areas landwards of MHWS. This enables coverage of a wider study area that extends beyond the boundary of the EIA Scoping Area.

- 12.2.3 This study area extent is considered to be robust as it is comparable to those used for other offshore linear schemes, to provide suitable context and to better understand the potential and significance of designated and non-designated marine heritage assets that might be directly impacted by the Proposed Development. For example, the pre-construction marine archaeological assessments for the consented Iceni and Circe 2 subsea telecommunications cables, which respectively made landfall on the Norfolk and Suffolk coasts, used a 2km-wide study corridor centred on the cable route [2], [3]. The use of a wider study area beyond the EIA Scoping Area boundary is considered particularly important for the marine historic environment given that certain asset types, principally documented losses of historic ships and aircraft, may not have accurately recorded positions.
- 12.2.4 Appendix 22.1 to this chapter sets out the legislation, policy and guidance relevant to the marine historic environment. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

## 12.3 Consultation and Engagement

- 12.3.1 Initial engagement will be undertaken with Historic England ('HE'), as specialist advisor to the Marine Management Organisation ('MMO'), Suffolk County Council Archaeological Service ('SCCAS') and Norfolk County Council Environment Service ('NCCES'), who share administrative jurisdiction of the intertidal zone with HE. This will be to introduce the Proposed Development, discuss and agree the scope and methodology of the marine historic environment desk-based assessment ('MHEDBA'), including the extent of the study area, resources to be consulted and marine historic environment receptors that have the potential to receive significant effects from the Proposed Development.



- 12.3.2 The scope of any evaluation methods to be undertaken alongside the MHEDBA will also be discussed during this initial engagement. These investigations will include relevant offshore engineering surveys; specifically geophysical survey and geotechnical investigations, to maximise their potential use for marine historic environment purposes. These could also include purposive marine archaeology investigations such as a foreshore survey, comprising a site walkover, geophysical and metal detector surveys, and possibly geoarchaeological borehole survey at the landfall location. Any Method Statement/Written Scheme of Investigation ('WSI') for evaluative work will be prepared in consultation with and approved by HE and, where evaluative works are proposed within the intertidal zone, SCCAS and/or NCCES. Together with the MHEDBA, these surveys will inform the marine historic environment chapter of the ES.
- 12.3.3 Following completion of the MHEDBA and any required evaluative surveys, further consultation will be carried out with HE to determine the mitigation strategy. As above, SCCAS and NCCES will be involved in such discussions where relevant. The mitigation strategy will be detailed in a project-specific WSI, which will be submitted for review and comment to the relevant consultees prior to the onset of works.
- 12.3.4 Other consultees and stakeholders will be consulted throughout the process, where required.
- 12.3.5 The ES will summarise the outcomes of consultation and engagement with statutory and non-statutory marine heritage consultees and will identify where agreement has been reached on scope, methodology, mitigation and any effects scoped out of the assessment.

## **12.4 Baseline Environment**

- 12.4.1 The following assessments and surveys will be prepared/undertaken for the proposed LSO section (Option 1) for the Proposed Development and used to inform the marine historic environment baseline for the ES.

- MHEDBA.

- Archaeological review of marine geophysical survey data.
- Geoarchaeological assessment of project-specific geotechnical data, following the staged assessment methodology outlined by Collaborative Offshore Wind Research into the Environment ('COWRIE') [4].
- Foreshore survey, if deemed necessary following initial archaeological assessments in consultation with the local and national curators; respectively SCCAS and NCCES, and HE.

12.4.2 The following sources will be consulted to prepare the baseline and provide information on the presence of any known/previously recorded marine heritage assets within the offshore study area:

- United Kingdom Hydrographic Office ('UKHO') database of wrecks and obstructions [5].
- UKHO open-source high resolution seabed mapping data [6].
- National Heritage List for England for designated heritage assets [7].
- National Marine Heritage Record ('NMHR') for records of marine and intertidal archaeology, including documented losses of wrecks and aircraft [8].
- Suffolk Historic Environment Record, including results of Rapid Coastal Zone Assessment ('RCZA') surveys, for records of designated and non-designated heritage assets seawards of MHWS.
- Norfolk Historic Environment Record, including results of RCZA surveys, for records of designated and non-designated heritage assets seawards of MHWS.
- HE's Historic Seascape Characterisation for Newport to Clacton and adjacent waters [9].
- Coastal and Intertidal Zone Archaeological Network.
- Marine Environment Data and Information Network.
- Admiralty Charts.
- Historic maps and charts as held by the National Library of Scotland.
- Archaeological Data Service.
- Background British Geological Survey geological mapping and literature.
- Relevant geological, geoarchaeological, archaeological and academic sources and literature.

12.4.3 The details provided below present an initial review of the marine historic environment resource within the proposed LSO section of the EIA Scoping Area and the surrounding wider study area. Information on designated and

non-designated marine heritage assets was obtained from the NMHR, the UKHO database of wrecks and obstructions, and relevant academic literature. The locations of recorded marine heritage assets are shown on Figure 12-1. The baseline below should be read in conjunction with this figure. A more detailed assessment will be presented within the MHEDBA and the marine historic environment chapter of the ES using the full range of source material.

- 12.4.4 The earliest evidence for the hominin [10] occupation of Britain, and indeed northwestern Europe, has been found on the coastline of East Anglia at the internationally important sites of Happisburgh and Pakefield, approximately 33km to the north and approximately 11km to the south of the proposed LSO section of the EIA Scoping Area, respectively. The supporting archaeological evidence consists of flint artefacts, and at Happisburgh, hominin footprints preserved on a surface of estuarine silts exposed on the foreshore. The earliest evidence is from Happisburgh Site 3, currently dated to between approximately 1 mega-annum ('ma') and 800 kilo-annum ('ka'); Pakefield is slightly later, and likely dates to approximately 700ka [11], [12], [13].
- 12.4.5 The source of the finds is the Cromer Forest-bed Formation ('CF-bF'), a complex and spatially variable sequence of marine, estuarine and freshwater channel deposits, laid down over a period of several hundred thousand years during the Early Pleistocene (pre-780ka) and early Middle Pleistocene (approximately 780-450ka), and later buried by glacial sediments deposited either by the Anglian glaciation (marine isotope stage ('MIS') 12: approximately 478-424ka) or the Happisburgh glaciation (MIS 16: approximately 676-621ka) depending on which chronostratigraphic scheme is followed [14], [15], [16].
- 12.4.6 The CF-bF is present discontinuously around the northeastern coastline of East Anglia, mainly where it has been revealed by coastal erosion. Significantly for the proposed LSO section of the EIA Scoping Area, some of the artefact-bearing beds at the Pakefield site (principally the Rootlet bed

and the overlying laminated silty clays) have also been identified at Corton, where they have been known as a source of Pleistocene mammal fossils since the late 19<sup>th</sup> century [17]. Large sections of the CF-bF at Corton are now hidden under sea defences, but an approximately 150m long stretch located at the base of the cliffs within the study area was exposed in the 1980s [18], and still appears to be intermittently exposed, together with Pleistocene mammal remains [19].

12.4.7 No archaeological finds are presently known from the CF-Bf exposure at Corton, but its similarity to the Pakefield site means that this possibility cannot be ruled out. There is one Palaeolithic find recorded in the NMHR from the northern part of the study area, though it is unclear from which deposit it originates:

- Findspot of a Palaeolithic handaxe (NMHR: PRN1047797) on the coastal cliff south of Gorleston golf links.

12.4.8 The extension of the CF-bF further out to sea within the study area is presently unclear. High resolution marine geophysical survey and geotechnical investigation conducted in 2006 directly offshore of the Pakefield site found no evidence for the CF-bF. Only the underlying Wroxham Crag Formation (an Early Pleistocene shallow marine deposit) was found directly under recent marine sediment. The Wroxham Crag formation is, nevertheless, considered to have archaeological potential; at the Pakefield site, at least one flint artefact was found at the top of the Wroxham Crag Formation directly under the CF-bF [20].

12.4.9 The 2006 geophysical survey also ran a single sub-bottom profiler ('SBP') line from Lowestoft northwards to Great Yarmouth, intersecting the study area. This SBP line showed a series of horizontal and sub-horizontal sub-seabed reflections indicative of buried stratigraphy. However, no detailed interpretation or geotechnical investigation was conducted to identify which deposits these reflections represented.

12.4.10 The offshore equivalent of the CF-bF, the Yarmouth Roads Formation, has been found further out to sea east of Great Yarmouth. During the Anglian

glaciation, channels were incised into these Early Pleistocene sediments and were themselves successively infilled by fluvial, estuarine and alluvial deposits ranging in age from the Saalian (MIS9-7) to the early Holocene. Crucially, archaeological finds have been made in this area as result of aggregates extraction in License Area 240, most notably an assemblage of Middle Palaeolithic flint artefacts from floodplain sediments deposited between 250-200ka [21].

- 12.4.11 There is also evidence of human occupation in later prehistory and more recent periods along the coast in the vicinity of the study area. For example, a Bronze Age cemetery and trackway are recorded at Hopton-on-Sea, as are Iron Age to Roman period enclosures and field systems [22] (discussed in more detail within chapter 11 terrestrial historic environment, paragraphs 11.4.23 to 11.4.26). However, the presence of in situ material located in the intertidal zone of the study area which post-dates the Pleistocene is considered to be unlikely, primarily as a result of the significant coastal erosion that has reshaped much of the East Anglia coast, potentially since the Roman period [23], [24]. The stretch of coastline between Gorleston and Corton is erosion-prone; historic retreat rates of 0.55-0.78m per annum have been estimated for the period between 1889 to 1998 [25] and sea defences have been constructed to prevent erosion, for example, at Hopton-on-Sea. The long-term prevailing trend of erosion means that any post-Pleistocene material found on the beach seawards of MHWS has likely eroded out of the backshore cliff or washed up from offshore.
- 12.4.12 A significant majority of the evidence for historic maritime activity in the vicinity of the study area postdates the Medieval period. Lowestoft and Great Yarmouth both have their roots in the Late Saxon period and developed into major ports supporting the local herring fishery, an important component of the medieval economy from the 10th-11th centuries onwards [26], [27], [28]. Great Yarmouth, in particular, was sufficiently important that, by the 15th century, it was one of the 15 head customs ports in England [29].

- 12.4.13 The presence of these ports on either side of the study area resulted in significant maritime traffic, both for fishing and trade across the North Sea and along the English coast. This inevitably resulted in numerous losses due to storms or bad weather, with many ships wrecked on the coast or the outlying sandbanks of Holm Sand and Corton Sands.
- 12.4.14 This is evidenced by documented losses recorded in the NMHR. 21 ships were recorded as lost at Hopton-on-Sea, 14 of which wrecked in the same storm of 1739. The named location for these losses is positioned within the study area. However, the named locations of losses are generalised and often inaccurate. These should be taken as an indication that the potential exists to encounter unrecorded shipwrecks, rather than definitive evidence that the material remains of shipwrecks exist at the given location. This is particularly the case with ships that ran aground on the foreshore, where they were often readily accessible for salvage and prone to breaking up as a result of wave action before finally becoming buried. The combination of deliberate removal, natural disintegration and burial can make locating losses in this type of environment problematic.
- 12.4.15 This also means that named locations currently mapped outside, but which could conceivably overlap with the study area, should also be considered. This includes the named locations “at/near Corton” (25 losses), “Corton beach” (10 losses) and “near Gorleston” (10 losses). Together, these highlight the strong possibility that numerous ships have wrecked on the shore of the study area and that wreck remains could exist underwater and/or in the intertidal zone.
- 12.4.16 There are 12 locations within the study area where wreck remains, or possible remains, have been recorded either in the NMHR or by the UKHO [30]. Four of these are confirmed wrecks including:
- The *Lady Londonderry*, a steam collier lost in 1918 (UKHO: WID10453/NMHR: PRN1015365).
  - Two wrecks located close to shore (UKHO: WID10450/NMHR: PRN1058420 and UKHO: WID10455/NMHR: PRN1054778). One of these is likely to be the wreck of the *White Swan*, lost in 1916.

- The *Roxanna*, a yacht lost in 1971 (UKHO: WID10444).
- 12.4.17 The remaining eight records consist of seabed obstructions, debris or anomalies visible on high-resolution bathymetric data, including:
- Two areas of foul ground (UKHO: WID 64279 and UKHO: WID10746/NMHR: PRN1025405/NMHR: PRN 1056777), both not found by recent surveys and recorded as ‘dead’.
  - Six upstanding anomalies suggestive of wreckage (UKHO: WIDs 10455; 57450; 66475; 88976; 88977; 88978).
- 12.4.18 The origin of these features has yet to be confirmed. These may represent the remains of unidentified wrecks. None of these marine heritage assets are designated.
- 12.4.19 Large stretches of the East Anglia coast were also defended in the First and Second World Wars against air raids and invasion by sea (discussed in more detail within chapter 11 terrestrial historic environment). One site is currently recorded in the NMHR within the study area:
- The Hopton emergency coastal battery (NMHR: PRN1022923), equipped with naval guns and constructed in 1941.
- 12.4.20 Elsewhere, the remains of these defences and associated infrastructure have frequently been found along the coast. In eroding areas such as East Anglia, this often includes material which has collapsed from the backshore cliff onto the beach. The potential therefore exists for such material to be present along the shore of the study area.
- 12.4.21 Both World Wars also witnessed numerous aircraft losses. As with documented losses of ships, the locations provided are often inaccurate. Therefore, although there are no confirmed losses of aircraft within the study area, there are several recorded losses with positions which could overlap with the study area, such as named locations off Corton and off Gorleston. Therefore, military aviation-related material could potentially be present on the seabed within the study area. If encountered, these would be protected automatically under the Protection of Military Remains Act 1986 [31]. Any works that could damage, move or unearth items at such sites



require the Ministry of Defence to be notified and a licence obtained from the Joint Casualty and Compassionate Centre [32].

## 12.5 Likely Significant Effects

12.5.1 Whilst the Proposed Development will be designed to limit impacts on the marine historic environment, where practicable, there is still the potential for direct and indirect effects to occur during its construction, operational and decommissioning phases. The following section outlines the potential pathways of impacts and the likely significant effects that may arise during these phases of the Proposed Development.

### Construction Phase

12.5.2 Construction phase works relate primarily to the installation of the LSO, and the diffuser structure which protrudes above the seabed. Installation will be carried out either by full horizontal directional drilling ('HDD') to the diffuser structure or by a combination of initial HDD and then trenching to the diffuser (refer to paragraph 2.4.8 of chapter 2 the Proposed Development for further details). Both approaches would involve disturbance to the seabed and sub-seabed and therefore have the potential to directly and indirectly impact known marine heritage assets, such as those described in Section 12.4 above, and unrecorded marine heritage assets, the presence and sensitivity of which are currently unknown. Without mitigation in place, this would likely result in significant adverse effects.

### Direct Impacts

12.5.3 Direct impacts can occur to assets situated on the seabed, or buried within its deposits, potentially causing irreversible damage to, or complete destruction of, archaeological material, or the relationship between that material and the broader environment. These contextual relationships are critical for interpreting and understanding the significance of an asset. Direct impacts might occur where assets lie within the footprint of any intrusive works associated with the Proposed Development.



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### Indirect Impacts

- 12.5.4 The Proposed Development has the potential to cause indirect impacts via alterations to local scale geomorphological processes (hydrodynamic and sedimentary) caused by seabed construction activities. Changes to coastal processes could lead to altered erosion and accretion patterns, whilst changes to tidal currents might impact the stability of nearby morphological and archaeological deposits. This may lead to buried historic assets being exposed to and negatively impacted by marine processes. Conversely, enhanced sedimentation that results in the burial of an exposed site may represent a beneficial impact.
- 12.5.5 The Proposed Development also has the potential to indirectly impact the setting of historic environment assets (as set out in HE's The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 [33]). The characteristics of an asset's setting can enhance or diminish its significance, influence how that significance is understood, or make a neutral contribution. Similarly, the introduction of new elements in a historic seascape may in turn re-shape how people perceive and interpret that seascape across the wider area.

### Operational Phase

#### Direct and Indirect Impacts

- 12.5.6 During the Proposed Development's operational phase, in areas where there will be direct impacts, impacts on archaeological material would have been suitably mitigated prior to, or during, construction and as such there would be no effect. The discharge of CRW is also considered unlikely to have any potential impacts on known or unrecorded marine heritage assets. However, the presence of any installed infrastructure on the seabed, such as the diffuser structure, or any parts of the LSO or protective material which rise above the seabed, has the potential to indirectly impact marine heritage assets located in the vicinity, particularly if these results in alterations to natural sediment dynamics. Long-term alteration or modification of local sediment dynamics may also occur as a result of the

emplacement of infrastructure on the seabed, in this case, the proposed LSO component (Option 1) of the Proposed Development. Depending on the nature of its interaction with prevailing hydrodynamic forces, this has the potential to cause either enhanced downstream erosion or burial.

- 12.5.7 There is also potential for further damage to known and unknown marine heritage assets as a consequence of maintenance activities. These could involve, for example, anchoring of works vessels, or exposure of the LSO for repairs. These impacts are likely to be similar to impacts during the construction phase but of lower magnitude and spatially restricted. There is potential for significant adverse effects but this will depend on the type and duration of maintenance activities and their location relative to any marine heritage assets. Any operational maintenance activities will be described and assessed in the ES, as relevant.

## Decommissioning Phase

### Direct and Indirect Impacts

- 12.5.8 If the Proposed Development is left in situ following decommissioning, any further direct or indirect impacts to marine heritage assets are likely to be minimal or not occur. If, however, decommissioning is to include removal of the proposed LSO component (Option 1) of the Proposed Development, direct and/or indirect impacts to marine heritage assets are likely, which are anticipated to be similar to impacts during the construction phase with the likely significant effects to be assessed within the ES.

## 12.6 Impacts Scoped Out of the Assessment

- 12.6.1 At this scoping stage, no impacts potentially resulting from the proposed LSO component (Option 1) of the Proposed Development are proposed to be scoped out of the assessment in the marine historic environment chapter of the ES.
- 12.6.2 Should the proposed LSO component of the Proposed Development in the ES comprise either Option 2 or Option 3, which are unlikely to have any significant effects on the marine historic environment, an assessment of the

likely significant effects of the Proposed Development on the marine historic environment would be scoped out of the ES.

## 12.7 Proposed Approach to Mitigation

12.7.1 Potential mitigation measures to avoid, reduce or offset significant adverse effects are outlined below. A WSI documenting the scope and methodology of the proposed mitigation measures would be prepared and agreed with the relevant stakeholders prior to their implementation.

### Primary (Inherent) Mitigation

12.7.2 Primary mitigation will comprise avoidance and in situ preservation of marine heritage assets as far as possible. Avoidance of assets could require, for example, an alteration to the proposed alignment of the proposed LSO (Option 1), or restriction of areas in which works vessels may anchor during the Proposed Development's construction, operational and decommissioning phases. The results of the MHEDBA and evaluation investigations, such as archaeological review of project-specific marine geophysical data, geoarchaeological assessment of geotechnical samples and non-intrusive surveys within the intertidal zone and foreshore (where required), will determine the presence and value of archaeological remains within the proposed LSO section of the EIA Scoping Area and inform whether avoidance/preservation in situ is required. This could be achieved through the implementation of Archaeological Exclusion Zones ('AEZs') around significant marine heritage assets such as prehistoric archaeological sites on the seabed, wrecks and aviation remains. The purpose of an AEZ is to exclude all activities which could result in adverse effects within the exclusion zone, thereby protecting known and potential marine heritage assets from accidental damage.

12.7.3 Primary mitigation measures would also include:

- Specialist archaeological analysis and interpretation by marine archaeologists, of any additional marine geophysical survey data acquired subsequent to evaluation investigations for marine historic environment chapter of the ES.

- Additional assessments of geotechnical samples following the staged approach outlined by COWRIE, and scientific analysis of any deposits of palaeoenvironmental interest encountered during the construction phase of the proposed LSO component (Option 1) of the Proposed Development.

### Secondary (Foreseeable) Mitigation

12.7.4 Secondary mitigation measures that may be implemented for the Proposed Development include:

- Watching brief undertaken on any intrusive works carried out on the foreshore or in the intertidal zone during the construction phase of the proposed LSO component (Option 1) of the Proposed Development.
- A project-specific Protocol for Archaeological Discoveries ('PAD') will be developed and implemented in case of discoveries of unexpected archaeological material made during any seabed or intertidal construction activities. The PAD will cover the steps required to stabilise, record, conserve and report any such finds, following the relevant best practice guidance, comprising The Crown Estate's Protocol for Archaeological Discoveries: Offshore Renewables Projects (2014) [34]. Although this guidance was published for offshore renewable energy infrastructure projects, it also applies to the proposed LSO component (Option 1) of the Proposed Development.

### Tertiary (Inexorable) Mitigation

12.7.5 The implementation of measures set out in a Construction Environmental Management Plan ('CEMP') and a Decommissioning Environmental Management Plan ('DEMP'), which will be in accordance with the Outline Construction Environmental Management Plan ('OCEMP') and the Outline Decommissioning Environmental Management Plan ('ODEMP'), respectively, to be submitted in support of the DCO application, would help to minimise potentially significant effects on marine heritage assets. These measures may include but are not limited to:

- Implementation of considerate construction practices including site hoarding and tidy working methods.
- Control of access routes, materials storage and compound locations to avoid unnecessary encroachment on or near to sensitive marine heritage assets.

## 12.8 Proposed Approach to the ES

- 12.8.1 The MHEDBA and surveys will be used to inform the marine heritage baseline for the marine historic environment chapter of the ES. They will also be used to inform engagement with relevant stakeholders (comprising HE, SCCAS and NCCES) to discuss mitigation strategies as set out within the ES, and the need for any additional evaluation, beyond what has been outlined above. This may include, though is not limited to, the production of a ground deposit model or targeted coring in areas considered to be of high geoarchaeological and/or palaeoenvironmental potential. The MHEDBA will use the agreed study area (as outlined in Section 12.2) in consultation with HE, SCCAS and NCCES.
- 12.8.2 The survey methods are likely to include geophysical survey, geotechnical investigation and foreshore survey to confirm the presence (or absence) and significance of any marine archaeological remains. The results of the MHEDBA and evaluation will inform the requirement and scope of further specialist evaluation and mitigation measures such as the geoarchaeological and palaeoenvironmental analysis of recovered core samples.
- 12.8.3 All archaeological investigations will also be subject to ongoing, findings led, engagement with HE, SCCAS and NCCES as relevant/appropriate. The results of the required pre-determination surveys and investigations will inform the marine historic environment chapter of the ES.

### Assessment Methodology

- 12.8.4 The assessment methodology to be used for the marine historic environment departs from the methodology set out in chapter 3 EIA methodology. It follows instead the approach and criteria set out in National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 104 Environmental Assessment and Monitoring (2020) [35] ('the DMRB LA 104 Guidance'). Whilst the DMRB LA 104 Guidance was published for highways schemes; it is a widely adopted methodology for assessing impacts upon the historic environment for other types of projects

and comprises the relevant best practice guidance for the assessment of likely significant effects on the marine historic environment resulting from the Proposed Development.

### Value of Receptors

- 12.8.5 Marine heritage assets are finite and irreplaceable [36]. Any direct impacts are generally permanent and irreversible. The ability of assets to absorb change, as per the concept of sensitivity outlined in chapter 3 EIA methodology (Table 3-3), is therefore not applicable. For the marine historic environment, the value of a receptor is therefore considered to be more appropriate for impact assessment.
- 12.8.6 The value of marine heritage assets will be assessed on the basis of existing designations, but allowing for professional judgement, supported by best practice guidance, where features are found which do not have any formal national or local designation (non-designated heritage assets). The value of marine heritage assets will be assessed on a five-point scale of, very high, high, medium, low and negligible.
- 12.8.7 The criteria that will be used to assess the value of marine heritage assets is presented in Table 12-1 which is reproduced from Table 3.2N in the DMRB LA 104 Guidance. This five-point scale allows for a nuanced classification which can account for the variety of heritage assets and potential assets found in the marine environment, which include designated and non-designated sites and palaeolandscapes, and geophysical anomalies of varying potential to be archaeological material. It should be noted that value is usually, though not exclusively, synonymous with archaeological potential.

Table 12-1: Value Criteria

| Value of Historic Environment Resource | Typical Description                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very High                              | Very high importance and rarity, international scale and very limited potential for substitution. In a marine context, this includes designated wrecks and non-designated assets that can be shown to have demonstrable international importance.                                                                                                                     |
| High                                   | High importance and rarity, national scale, and limited potential for substitution. This might include non-designated assets with a demonstrable national importance, new sites or features identified in the geophysical data and considered to be of high potential and historic seascapes exhibiting considerable coherence, time-depth or other critical factors. |
| Medium                                 | Medium or high importance and rarity, regional scale, limited potential for substitution. This may include geophysical anomalies with medium archaeological potential and historic seascape areas that exhibit reasonable coherence and time-depth.                                                                                                                   |
| Low                                    | Low or medium importance and rarity, local scale.                                                                                                                                                                                                                                                                                                                     |
| Negligible                             | Very low importance and rarity, local scale.                                                                                                                                                                                                                                                                                                                          |

### Magnitude of Impact

- 12.8.8 Magnitude of impact is the degree of change that would be experienced by a marine heritage asset and its setting during the construction, operational and decommissioning phases of the Proposed Development. The magnitude of impact is assessed without reference to the value of the marine heritage asset and could include physical impacts or impacts on its setting from the Proposed Development.
- 12.8.9 Effects may be temporary or permanent, direct or indirect and may be adverse, beneficial or may result in no change. The magnitude of impact will be assessed using a five-point scale of, major, moderate, minor, negligible and no change. The assessment is based on professional judgement and follows criteria provided in the DMRB LA 104 Guidance.
- 12.8.10 As noted above, marine heritage assets are finite and irreplaceable. It is therefore essential to understand how the Proposed Development may

affect their preservation. These criteria are considered appropriate for marine heritage assets because they allow explicit evaluation of impacts which could affect asset preservation in both positive (i.e. beneficial) and negative (i.e. adverse) ways. Factors in the assessment of the magnitude of impact for all marine heritage assets are presented in Table 12-2.

Table 12-2: Magnitude of Impact Criteria

| Magnitude of Impact (Change) |            | Typical Description                                                                                                                                                               |
|------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Major                        | Adverse    | Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.                                                            |
|                              | Beneficial | Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.                                                              |
| Moderate                     | Adverse    | Loss of resource but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.                                                  |
|                              | Beneficial | Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.                                                                          |
| Minor                        | Adverse    | Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.                      |
|                              | Beneficial | Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring. |
| Negligible                   | Adverse    | Very minor loss or detrimental alteration to one or more characteristics, features or elements                                                                                    |
|                              | Beneficial | Very minor benefit to or positive addition of one or more characteristics, features or elements.                                                                                  |
| No change                    |            | No loss or alteration of characteristics, features or elements; no observable impact in either direction.                                                                         |

## Significance of Effect

12.8.11 The significance of effect on marine heritage assets will be determined as a combination of the assessment of the value of the asset and the magnitude of impact. This is achieved using professional judgement informed by the matrix (taken from the DMRB LA 104 Guidance) illustrated below in Table



12-3. Five levels of significance (very large, large, moderate, slight and neutral) are defined which apply equally to adverse and beneficial effects. Where two significances of impacts are given in the table (for example, slight or neutral), professional judgement will be used in the assessment to state the likely significance of effect, applying a 'cautious 'worst case' approach' in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning Inspectorate's NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026) [37]. As noted above, marine heritage assets are finite and irreplaceable, with direct impacts likely to cause permanent and irreversible adverse effects. Therefore, and based on current practice in marine historic environment impact assessment, a significance of effect of slight or above is judged to be significant.

Table 12-3: Matrix for Assessing Significance

|                                                    |            | Magnitude of Impact (Change) |                   |                    |                     |                     |
|----------------------------------------------------|------------|------------------------------|-------------------|--------------------|---------------------|---------------------|
|                                                    |            | No Change                    | Negligible        | Minor              | Moderate            | Major               |
| Value (Sensitivity) of Historic Environment Record | Very High  | Neutral                      | Slight            | Moderate or large  | Large or very large | Very large          |
|                                                    | High       | Neutral                      | Slight            | Slight or moderate | Moderate or large   | Large or very large |
|                                                    | Medium     | Neutral                      | Neutral or slight | Slight             | Moderate            | Moderate or large   |
|                                                    | Low        | Neutral                      | Neutral or slight | Neutral or slight  | Slight              | Slight or moderate  |
|                                                    | Negligible | Neutral                      | Neutral           | Neutral or slight  | Neutral or slight   | Slight              |

## Mitigation and Residual Effects

12.8.12 The marine historic environment chapter of the ES will assess the likely significant effects of the Proposed Development both before and after the implementation of mitigation measures:

- Pre-mitigation effects (or 'unmitigated effects'): effects that would occur in the absence of any mitigation.

- Residual effects: effects that remain after the implementation of mitigation measures (primary, secondary, and tertiary), representing the ‘cautious ‘worst case’ outcome in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s NSIPs - Pre-Application Advice on Environmental Impact Assessment (July 2026).

12.8.13 As set out in Section 12.7 above, the assessment will distinguish between primary (inherent), secondary (foreseeable) and tertiary (inexorable). Where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES.

### In-combination Effects

12.8.14 In-combination effects from a proposed development are the combined effects that occur from multiple environmental impacts, and which could result in cumulative effects on the marine historic environment. While these effects may not be considered significant in isolation, when combined, they could result in a significant effect to a marine heritage asset.

12.8.15 As set out in chapter 3 EIA methodology, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within the cumulative effects assessment chapter of the ES.

### Limitations and Assumptions

12.8.16 From the available baseline data (as set out in Section 12.4), it is evident that the study area contains some marine heritage assets. However, in the absence of a MHEDBA and any evaluative surveys at this scoping stage, it is not possible to determine their value (i.e. nationally, regional or locally significant remains and deposits) or confirm if they represent all marine heritage assets in the study area.

12.8.17 Therefore, adopting a ‘cautious ‘worst case’ approach’ at this scoping stage, it is assumed that any direct and indirect impacts from the Proposed Development would have a significant adverse effect upon marine heritage

assets located within and in proximity to the study area, prior to the implementation of mitigation measures.

## **12.9 Summary of Impacts and Effects**

- 12.9.1 Table 12-4 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the marine historic environment chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 12-4: Summary of Marine Historic Environment Scope

| Receptor                                                                                                                       | Effects                                                                                                                                                                    | Anticipated Magnitude | Anticipated Value  | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                      | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Construction Phase</b>                                                                                                      |                                                                                                                                                                            |                       |                    |                                                |                                                                                                                                                                                                                                                                                                                                                 |                       |
| Marine heritage assets (e.g. seabed prehistory, maritime archaeology, buried remains within the intertidal and subtidal zones) | Direct impact to known and unknown marine heritage assets within the footprint of the LSO component (Option 1) of the Proposed Development due to construction activities. | Negligible to Major   | Negligible to High | Significant                                    | Not yet known at this scoping stage but likely to include avoidance/preservation in situ or preservation by record (geoarchaeological/ palaeoenvironmental analysis of core samples, archaeological monitoring etc.). To be confirmed in the ES. Measures set out in a Construction Environmental Management Plan in accordance with the OCEMP. | Scoped in             |
|                                                                                                                                | Direct and indirect impacts to known and unknown marine heritage assets from geomorphological changes due to                                                               | Negligible to Major   | Negligible to High | Significant                                    | Not yet known at this scoping stage but likely to include avoidance/preservation in situ or preservation by record (geoarchaeological/ palaeoenvironmental analysis of core samples, archaeological monitoring etc.). To be confirmed in the ES. Measures set out in a Construction                                                             | Scoped in             |

| Receptor | Effects                                                                                                                                                                                                             | Anticipated Magnitude | Anticipated Value  | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                      | Scoped in/ Scoped out |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|          | construction activities for the LSO component (Option 1) of the Proposed Development.                                                                                                                               |                       |                    |                                                | Environmental Management Plan in accordance with the OCEMP.                                                                                                                                                                                                                                                                                     |                       |
|          | Impacts to the setting and significance of marine heritage assets that are periodically, partially or wholly submerged due to construction activities for the LSO component (Option 1) of the Proposed Development. | Negligible to Major   | Negligible to High | Significant                                    | Not yet known at this scoping stage but likely to include avoidance/preservation in situ or preservation by record (geoarchaeological/ palaeoenvironmental analysis of core samples, archaeological monitoring etc.). To be confirmed in the ES. Measures set out in a Construction Environmental Management Plan in accordance with the OCEMP. | Scoped in             |

| Receptor                                                                                                                       | Effects                                                                                                                                                                      | Anticipated Magnitude | Anticipated Value  | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                         | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------------------------------------------|--------------------------------------------------------------------|-----------------------|
| <b>Operational Phase</b>                                                                                                       |                                                                                                                                                                              |                       |                    |                                                |                                                                    |                       |
| Marine heritage assets (e.g. seabed prehistory, maritime archaeology, buried remains within the intertidal and subtidal zones) | Direct impact to known and unknown marine heritage assets resulting from outfall discharge and/or maintenance from the LSO component (Option 1) of the Proposed Development. | Negligible to Major   | Negligible to High | Significant                                    | Not yet known at this scoping stage but to be confirmed in the ES. | Scoped in             |
|                                                                                                                                | Direct and indirect impacts to known and unknown marine heritage assets consequent of geomorphological changes                                                               | Negligible to Major   | Negligible to High | Significant                                    | Not yet known at this scoping stage but to be confirmed in the ES. | Scoped in             |

| Receptor | Effects                                                                                                                                                                              | Anticipated Magnitude | Anticipated Value  | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                         | Scoped in/ Scoped out |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------------------------------------------|--------------------------------------------------------------------|-----------------------|
|          | resulting from installed infrastructure, outfall discharge and/or maintenance from the LSO component (Option 1) of the Proposed Development.                                         |                       |                    |                                                |                                                                    |                       |
|          | Impacts to the setting and significance of marine heritage assets that are periodically, partly or wholly submerged resulting from outfall discharge and/or maintenance from the LSO | Negligible to Major   | Negligible to High | Significant                                    | Not yet known at this scoping stage but to be confirmed in the ES. | Scoped in             |

| Receptor                                                                                                                                                                                 | Effects                                                                                                                                             | Anticipated Magnitude | Anticipated Value  | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                           | Scoped in/ Scoped out |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                                                                                                                                          | component (Option 1) of the Proposed Development.                                                                                                   |                       |                    |                                                |                                                                                                                                                                      |                       |
| <b>Decommissioning Phase</b>                                                                                                                                                             |                                                                                                                                                     |                       |                    |                                                |                                                                                                                                                                      |                       |
| Marine heritage assets (if the LSO component (Option 1) of the Proposed Development is left in situ) (e.g. seabed prehistory, maritime archaeology, buried remains within the intertidal | Continuing direct/indirect impacts consequent of ongoing change in sediment dynamics from the LSO component (Option 1) of the Proposed Development. | Negligible to Major   | Negligible to High | Significant                                    | Not yet known at this scoping stage but to be confirmed in the ES. Measures set out in a Decommissioning Environmental Management Plan in accordance with the ODEMP. | Scoped in             |



| Receptor                                                                                                                                                                                                | Effects                                                                                                                                                                                                   | Anticipated Magnitude | Anticipated Value  | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                           | Scoped in/ Scoped out |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| and subtidal zones)                                                                                                                                                                                     |                                                                                                                                                                                                           |                       |                    |                                                |                                                                                                                                                                      |                       |
| Marine heritage assets (if the LSO component (Option 1) of the Proposed Development is removed) (e.g. seabed prehistory, maritime archaeology, buried remains within the intertidal and subtidal zones) | Direct/indirect impacts during deconstruction resulting in direct/indirect damage/ destruction of known and unknown marine heritage assets from the LSO component (Option 1) of the Proposed Development. | Negligible to Major   | Negligible to High | Significant                                    | Not yet known at this scoping stage but to be confirmed in the ES. Measures set out in a Decommissioning Environmental Management Plan in accordance with the ODEMP. | Scoped in             |

## 13 Traffic and Access

### 13.1 Introduction

- 13.1.1 This chapter describes the proposed approach which will be undertaken for the assessment of the likely significant effects resulting from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on traffic and access. The assessment will be presented within an Environmental Statement (‘ES’) submitted with the application for a Development Consent Order (‘DCO’). This chapter describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.
- 13.1.2 During the construction and decommissioning phases, impacts could arise from vehicles travelling to and from the Proposed Development to deliver or collect construction materials, plant and equipment, in addition to workforce travel. During the operational phase of the Proposed Development, there will be limited operational traffic movements, including worker movements and light goods vehicles [1] (‘LGV’) for general operations and maintenance purposes; deliveries using heavy goods vehicles [2] (‘HGV’); and the use of LGVs and HGVs in the event of equipment replacement.
- 13.1.3 The traffic and access chapter of the ES will be supported by a Transport Assessment (‘TA’) which will assess the impacts of the Proposed Development on the travel networks with a key focus on the implications of network peak periods. The TA will consider specific details of the strategy for accessing the Proposed Development during its construction, operational and decommissioning phases. This chapter should also be read in conjunction with the following chapters of the Scoping Report:
- Chapter 2 The Proposed Development.
  - Chapter 3 EIA Methodology.

- Chapter 14 Noise and Vibration.
- Chapter 15 Air Quality and Odour.
- Chapter 17 Socio-economics.
- Chapter 18 Human Health.

13.1.4 The author of this assessment has more than 30 years' technical experience in transport planning. They have worked on nationally significant infrastructure projects ('NSIPs') and other major infrastructure provision. This experience includes the planning, assessment and construction of major infrastructure projects in several sectors, including national transport infrastructure projects; and the appraisal of environmental traffic effects for NSIPs, Hybrid Bills, and engaging with Local Planning Authorities and other stakeholders.

## 13.2 Study Area

13.2.1 The EIA Scoping Area is shown in Figure 1-1. The study area for the assessment of the likely significant effects of the Proposed Development on traffic and access will be identified based on the EIA Scoping Area and the road network likely to be affected by the Proposed Development. This study area will cover a slightly different spatial area to the EIA Scoping Area to reflect the wider interactions with the travel networks. Figure 13-1 shows the EIA Scoping Area and surrounding strategic highway network that will inform the development of the study area.

13.2.2 The study area is expected to consist of, but is not limited to (subject to consultation and engagement), the following links:

- The A47 Yarmouth Road.
- The B1074 Blundeston Road.
- The A143 Beccles Road/Yarmouth Road.
- The A143 Norwich Road Old Yarmouth Road.
- The A144 Halesworth Road.
- The B1123 Chediston Road.
- The B1117 Halesworth Road/Rowe's Hill/Cookley Road.
- The B1116.

- The B118.
- The A140.
- The B1113 Walsham Road.
- The A1120 Yoxford Road.
- The A12 Main Road.
- The B1121 Main Road.
- The B1122 Leiston Road/Abbey Road.

13.2.3 To inform the study area of the assessment in the ES, the Proposed Development's components have been considered for their traffic-generation during the construction, operational and decommissioning phases of the Proposed Development. Table 13-1 identifies these components and indicates the infrastructure and activities that would generate traffic movements associated with each. For robustness, it is also necessary to consider the peak periods, when construction and operational traffic movements generated by the Proposed Development overlap. The impacts of the operational phase of most components of the Proposed Development will be limited to a low number of vehicle deliveries to and from, and maintenance activities at, the above-ground components, such as the service reservoirs and water treatment facilities.

Table 13-1: The Proposed Development's Components' Traffic-Generating Activities

| Component                                                                         | Traffic Movement Generating Activities                                  |                                          |                                                                              |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------|
|                                                                                   | Construction Phase                                                      | Operational Phase                        | Decommissioning Phase                                                        |
| <b>Proposed Advanced Water Recycling Plant ('AWRP')</b>                           |                                                                         |                                          |                                                                              |
| AWRP ( <i>Principal Component</i> )                                               | New water recycling plant and associated infrastructure                 | Daily operations and planned maintenance | Dismantling and potential removal of the proposed AWRP infrastructure        |
| Existing Lowestoft Water Recycling Centre ('WRC') ( <i>Subsidiary Component</i> ) | New pumping station                                                     | Infrequent planned maintenance           | No new traffic-generating activities resulting from the Proposed Development |
| <b>Proposed Long Sea Outfall ('LSO')</b>                                          |                                                                         |                                          |                                                                              |
| LSO (Options 1) ( <i>Principal Component</i> )                                    | New pipeline from the proposed AWRP to east coast and offshore pipeline | Infrequent planned maintenance           | Removal of onshore above-ground infrastructure                               |
| LSO (Options 2 and 3) ( <i>Principal Component</i> )                              | New pipeline from the proposed AWRP to east coast                       | Infrequent planned maintenance           | Removal of onshore above - ground infrastructure                             |
| <b>Proposed Service Reservoirs</b>                                                |                                                                         |                                          |                                                                              |
| Central Service Reservoir ('CSR') ( <i>Principal Component</i> )                  | New service reservoir ('SR') and associated infrastructure              | Daily operations and planned maintenance | Dismantling and potential removal of proposed CSR infrastructure             |
| Western Service Reservoir ('WSR') ( <i>Principal Component</i> )                  | New SR and associated infrastructure                                    | Daily operations and planned maintenance | Dismantling and potential removal of proposed WSR infrastructure             |
| <b>Proposed Pipelines</b>                                                         |                                                                         |                                          |                                                                              |
| Existing Lowestoft WRC to proposed AWRP Pipeline ( <i>Subsidiary Component</i> )  | New pipeline, air valves and wash-out                                   | Infrequent planned maintenance           | Decommission in situ of above-ground infrastructure                          |

| Component                                                                                      | Traffic Movement Generating Activities                  |                                |                                                     |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------|-----------------------------------------------------|
|                                                                                                | Construction Phase                                      | Operational Phase              | Decommissioning Phase                               |
| Proposed AWRP to River Waveney Pipeline ( <i>Principal Component</i> )                         | New pipeline, air valves, wash-out and outfall          | Infrequent planned maintenance | Decommission in situ of above-ground infrastructure |
| Proposed Barsham WTW to CSR Pipeline ( <i>Principal Component</i> )                            | New pipeline, air valves and wash-out                   | Infrequent planned maintenance | Decommission in situ of above-ground infrastructure |
| Barsham WTW to CSR Pipeline to Walpole WTW Pipeline ( <i>Subsidiary Component</i> )            | New pipeline branch connection, air valves and wash-out | Infrequent planned maintenance | Decommission in situ of above-ground infrastructure |
| Proposed CSR to Lodgewood Water Tower Pipeline ( <i>Subsidiary Component</i> )                 | New pipeline, air valves and wash-out                   | Infrequent planned maintenance | Decommission in situ of above-ground infrastructure |
| Proposed CSR to WSR Pipeline ( <i>Principal Component</i> )                                    | New pipeline, air valves and wash-out                   | Infrequent planned maintenance | Removal of above-ground infrastructure              |
| Proposed CSR to Saxmundham Pipeline ( <i>Principal Component</i> )                             | New pipeline, air valves and wash-out                   | Infrequent planned maintenance | Decommission in situ of above-ground infrastructure |
| Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') ( <i>Principal Component</i> ) | New pipeline, air valves and wash-out                   | Infrequent planned maintenance | Decommission in situ of above-ground infrastructure |
| <b>Proposed Distribution Mains</b>                                                             |                                                         |                                |                                                     |
| Eastern Distribution Mains ( <i>Principal Component</i> )                                      | New distribution pipelines                              | Infrequent planned maintenance | Decommission in situ of above-ground infrastructure |

| Component                                           | Traffic Movement Generating Activities |                                |                                                     |
|-----------------------------------------------------|----------------------------------------|--------------------------------|-----------------------------------------------------|
|                                                     | Construction Phase                     | Operational Phase              | Decommissioning Phase                               |
| Western Distribution Mains<br>(Principal Component) | New distribution pipelines             | Infrequent planned maintenance | Decommission in situ of above-ground infrastructure |

- 13.2.4 The study area for the assessment of traffic and access impacts during the Proposed Development's construction, operational and decommissioning phases will comprise the EIA Scoping Area in addition to certain locations of predicted impacts on the travel networks, which are located beyond the extent of the EIA Scoping Area. This extension would be governed by where the predicted significance of effects are anticipated to be greater than of minor adverse significance. These locations may include junctions on the A140, A143, A12 and A47. The justification for extending the EIA Scoping Area to incorporate these additional locations beyond the EIA Scoping Area will be based on engagement with the Local Highway Authorities ('LHAs') and Strategic Highway Authority ('SHA'), professional judgement, and the assessment of available traffic and accident data.
- 13.2.5 The spatial extent of the study area will further reflect the development of the distribution network of movements and the location of works access points, compounds and lay down areas. The construction and decommissioning phases of the Proposed Development will require temporary access junctions for movements to, and from, the areas of construction and decommissioning activities, as well as crossing points where construction traffic crosses but does not enter or leave the highway. The operational phase will require permanent accesses configured to serve aspects of the commissioned infrastructure. The temporary and permanent access points for the Proposed Development and their interfaces with the travel networks will inform the judgment of impacts.

### Temporal Scope

- 13.2.6 The assessment will consider the construction, operational and decommissioning phases of the Proposed Development as distinct temporal phases, recognising that the nature, volume and distribution of traffic movement may differ between each phase. For the construction phase, the temporal scope for the assessment of likely significant effects will be refined in collaboration with the wider project team to agree what will be assessed as the '*cautious 'worst case'*' scenarios for each period in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning



Inspectorate's NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026) [3] with reference to basing assessments on a 'cautious 'worst case' approach'. Due to the linear and wide spatial arrangement of the Proposed Development, the 'cautious 'worst case'' scenario may comprise a series of locational scenarios, including concurrent construction activities. The operational phase will be considered separately from the construction and decommissioning phases. The temporal scope of the operational phase will be focused on the general operation of the proposed WSR, CSR and AWRP components. The operation of the proposed pipeline components of the Proposed Development is anticipated to generate de minimis traffic movements and is therefore proposed to be scoped out of the operational phase assessment in the ES. The proposed WSR, CSR and AWRP components are sufficiently distant from one another such that no intra-project cumulative impact on the travel networks will be generated.

13.2.7 The spatial, temporal and technical scope of the traffic and access chapter of the ES, reflecting the construction, operational and decommissioning phase considerations described above, are to be confirmed with stakeholders, including:

- The LHAs of Suffolk County Council ('SCC') and Norfolk County Council ('NCC'); the SHA of National Highways ('NH').
- Network Rail (and emergent Great British Railways) as the railway's owner.
- The marine authorities of the Broads Authority ('BA') and the Port of Lowestoft.
- Active Travel England, representing the interests of walking, cycling and horse-riding communities.

13.2.8 Appendix 13.1 to this chapter sets out the relevant legislation, policy and guidance relevant to the traffic and access ES chapter. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

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### 13.3 Consultation and Engagement

- 13.3.1 Engagement will be undertaken throughout the EIA process with key stakeholders, including SCC, NCC, NH, and relevant district and borough councils.
- 13.3.2 At the time of writing, a virtual meeting has been held with SCC, as LHA, on 19 August 2025; a virtual meeting with NH on 5 December 2025; and a virtual meeting with all affected district and borough councils, NCC and SCC on 29 January 2026. The purpose of the meetings was to introduce the emerging scoping approach and discuss transport management plans, evidence requirements, and feedback on the proposed EIA Scoping Area, key interfaces, and sensitive receptors.
- 13.3.3 Further virtual meetings were held with NH on 25 March 2026 and SCC on 1 April 2026 to discuss highway matters in relation to the proposed AWRP component of the Proposed Development.
- 13.3.4 Further meetings will be scheduled with stakeholders including NCC, as LHA, to seek agreement on scoping matters.
- 13.3.5 Engagement will also be undertaken with other relevant traffic and access stakeholders, such as:
- Network Rail.
  - Active Travel England.
  - The Port of Lowestoft.
  - Walk Wheel Cycle Trust.
  - The Ramblers.
  - The British Horse Society.
  - Emergency Services.

### 13.4 Baseline Environment

- 13.4.1 The baseline environment in regard to traffic and access has been established to identify the existing conditions across the study area to inform the assessment of potentially significant effects arising from the Proposed Development. This includes consideration of the Strategic Road

Network ('SRN'), Local Road Network ('LRN'), Public Rights of Way ('PRoW'), rail infrastructure, bus services and cycle network.

- 13.4.2 The largest proportion of the study area is contained within the LRN managed by SCC LHA. To the north of Lowestoft, this study area crosses into the administrative boundary of NCC LHA, including its LRN and the A47 corridor, which is managed by NH as the SRN. Within Suffolk, the SRN corridors at the A14 and the A12 (i.e. southwest of the Copdock junction) are not forecast to be materially affected by traffic movements associated with the Proposed Development.
- 13.4.3 The study area intersects with PRoW as shown in Figure 13-2 which are included within the assessment of the Proposed Development's likely significant effects on walking, cycling and horse-riding users of the network. These routes predominantly fall within the administrative boundary of SCC, with some extending into the administrative boundary of NCC.

### Highway Network

- 13.4.4 The LRN within the study area in Suffolk is characterised by the spine of the A12 corridor running north-south to the east of the county between Ipswich and Lowestoft. North of Ipswich, the A12 passes through Woodbridge and Saxmundham, providing access to many communities. The A12 is largely dual-carriageway south of Wickham Market with a mix of at-grade and grade-separated junctions.
- 13.4.5 To the north of Lowestoft, the A12 continues to connect to the A47 corridor which crosses the county boundary between Suffolk and Norfolk. The A47 is an SRN link which connects through Great Yarmouth onwards to the east of Norwich as it passes out of the study area.
- 13.4.6 Crossing the north of the study area, the A146 runs east-west between Lowestoft and Beccles and on to Norwich. To the north and west of the study area, the A143 follows the administrative boundary separating the administrative areas of NCC and SCC, passing the communities of

- 
- Ditchingham and Bungay, Wortwell and Harleston, and Scole, where it connects with the north-south corridor of the A140 to the southeast of Diss.
- 13.4.7 The A1120 provides an east-west route through central Suffolk, connecting communities including Yoxford and Peasenhall. The A144 runs from Bungay to Halesworth and onwards to the A12 southwest of Lowestoft.
- 13.4.8 The B-class roads in the EIA Scoping Area play a crucial role in local access. Roads such as the B1077 and the B1119 link smaller villages and hamlets to the A-road network, supporting agricultural and residential traffic. The B1119, for example, runs through Saxmundham and Leiston, connecting communities to the A12.
- 13.4.9 The new public road infrastructure constructed as part of the SZC development will include a new link road between the A12 and B1122 and the two-village bypass, which will create a new link within the A12. Neither route will be materially affected by the construction, operational or decommissioning phases of the Proposed Development.
- 13.4.10 Other than the A12, roads within the study area are largely single carriageway roads.
- 13.4.11 Direct interfaces between the EIA Scoping Area and the SRN comprise its proposed pipeline components' EIA Scoping Area sections along the A47 corridor and if access to the proposed AWRP component is direct to the A47 in the final design of the Proposed Development, which is evolving. Direct interfaces between the Proposed Development and the LRN will be defined within the traffic and access chapter of the ES and within the supporting TA. Empirical traffic data will be collected for selected routes within the network to provide baseline traffic movements from which to judge the significance of effects. Those routes will be selected where it is anticipated that there could be impacts on the network which would result in significant effects on local sensitive receptors. In accordance with best practice, baseline traffic flows will be factored to allow for local projected growth. This will be carried out using the Government's Trip End Model
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Presentation Programme [4] ('TEMPPro') which will provide approved factors for the projection of traffic growth on roads within the study area.

- 13.4.12 Where appropriate, data output from the emerging Suffolk County Transport Model ('SCTM') will be used to supplement the empirical data. The forecast years within the model will be confirmed and where necessary, adjustments will be made to the data to align with the base case, peak construction year and forecast year of opening for the Proposed Development.
- 13.4.13 Information on road safety will be obtained from the Department for Transport ('DfT') database [5] to identify where there might be existing safety concerns which could be adversely affected by the construction, operational or decommissioning phases of the Proposed Development. If necessary, the summary data obtained from the DfT database will be supplemented by more detailed record information provided by the LHAs and the police.
- 13.4.14 Desk-based information on the location and context of the affected LRN will be supplemented by site observations, as necessary.

### Railway Network

- 13.4.15 The railway network that interfaces with the study area includes the East Suffolk line from Ipswich to Lowestoft, with a branch from Saxmundham to Leiston and a temporary green railway route to SZC for delivering construction materials. Additionally, there is an east-west line from Lowestoft to Norwich. Both lines carry passenger and freight trains, with approximately an hourly service on each. The rail network in the vicinity of the EIA Scoping Area is shown on Figure 13-4.
- 13.4.16 The EIA Scoping Area crosses the Ipswich to Lowestoft railway to the north of Saxmundham and the Lowestoft to Norwich line to the south of Somerleyton. These locations will be confirmed in the ES and the TA.

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### **Marine and Riparian Network.**

- 13.4.17 The location for the Proposed Development's AWRP component is to the north of Lowestoft, close to Hopton-on-Sea. There is no direct interface with the Port of Lowestoft. The marine and riparian environment that interfaces with the study area includes navigable waterways associated with the Broads National Park, with interactions primarily focused on navigable sections of the River Waveney. These navigations support leisure and limited commercial maritime and riparian traffic and represent the principal marine and riparian network receptors relevant to the Proposed Development.

### **Bus Network**

- 13.4.18 The bus network that interfaces with the study area operates along key corridors that provide connectivity between communities across Suffolk and into neighbouring counties. The principal corridors under consideration include the A12, A146, A143, A1120, A47 and A144. There are further minor and country roads that would be interfaced. These routes support a mixture of services.

### **Public Rights of Way Network**

- 13.4.19 The PRoW network that interfaces with the study area comprises a combination of footpaths and bridleways. These routes are present along a number of sections of the EIA Scoping Area and represent receptors that may interact with construction and operational activities associated with the Proposed Development. The PRoW network is shown in Figure 13-2.
- 13.4.20 Baseline data will be collected for affected parts of the network to inform the assessment of impacts.

### **Cycle Network and Infrastructure**

- 13.4.21 The cycle network that interfaces with the study area comprises of designated cycle routes forming part of the National Cycle Network ('NCN') and local cycle infrastructure. These routes provide connections for both leisure and commuting, linking destinations across Suffolk and Norfolk.

- 13.4.22 Key designated routes include NCN Route 1, a major north-south route running through Beccles, Halesworth and continuing past Saxmundham towards Ipswich. In addition, regional cycle routes 30, 31 and 42 connect Lowestoft to Eye, Southwold to Reedham and Bramfield to Snape going through Saxmundham and Leiston, respectively. Additional local and recommended cycle routes also provide connections. These are shown in Figure 13-5.
- 13.4.23 If required, usage data and further route mapping will be obtained from Walk Wheel Cycle Trust and local authorities to inform the assessment.
- 13.4.24 The EIA Scoping Area comprises sections for the Proposed Development's components, which are geographically distributed across the study area. Each section of the EIA Scoping Area interfaces with the transport network through both temporary construction routing and access and, where applicable, permanent operational access. The extent and nature of these interfaces are summarised within Table 13-2 to Table 13-12 below, presenting the baseline characteristics of each component's section of the EIA Scoping Area.

Table 13-2: Proposed AWRP Section of the EIA Scoping Area

|                                |                                                 |
|--------------------------------|-------------------------------------------------|
| <b>SRN</b>                     | A47                                             |
| <b>LRN</b>                     | Jay Lane, Station Road Roundabout               |
| <b>Temporary Access</b>        | From either Jay Lane or Station Road Roundabout |
| <b>Permanent Access</b>        | From either Jay Lane or Station Road Roundabout |
| <b>Crossing of HGV Network</b> | Yes                                             |
| <b>PRoW</b>                    |                                                 |
| <b>Footpath</b>                | E-84/007/0, E-84/006/0                          |
| <b>Bridleway</b>               | None Present                                    |
| <b>Other</b>                   | None Present                                    |
| <b>Rail Network</b>            | None Present                                    |
| <b>Cycle Network</b>           | None Present                                    |
| <b>Bus Services</b>            | X1, 1, 1A                                       |

Table 13-3: Proposed LSO Section of the EIA Scoping Area

|                                |                                         |
|--------------------------------|-----------------------------------------|
| <b>SRN</b>                     | A47                                     |
| <b>LRN</b>                     | Coast Road, Warren Road, Lowestoft Road |
| <b>Temporary Access</b>        | From either Warren Road or Coast Road   |
| <b>Permanent Access</b>        | No                                      |
| <b>Crossing of HGV Network</b> | Yes                                     |
| <b>PRoW</b>                    |                                         |
| <b><i>Footpath</i></b>         | E-202/002/0, Hopton-on-Sea FP2a         |
| <b><i>Bridleway</i></b>        | None Present                            |
| <b><i>Other</i></b>            | None Present                            |
| <b>Rail Network</b>            | None Present                            |
| <b>Cycle Network</b>           | NCN 517                                 |
| <b>Bus Services</b>            | X1, 1, 1A                               |

Table 13-4: Proposed CSR Section of the EIA Scoping Area

|                                |                                                                                                         |
|--------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>SRN</b>                     | A1120 Yoxford Road                                                                                      |
| <b>LRN</b>                     | Puoy Street, Halesworth Road, Peasenhall Road, Unnamed Road between Dunwich Lane and Weavers Marsh Lane |
| <b>Temporary Access</b>        | From Peasenhall Road                                                                                    |
| <b>Permanent Access</b>        | From Peasenhall Road                                                                                    |
| <b>Crossing of HGV Network</b> | No                                                                                                      |
| <b>PRoW</b>                    |                                                                                                         |
| <b><i>Footpath</i></b>         | E-538/016/0                                                                                             |
| <b><i>Bridleway</i></b>        | E-469/006/0                                                                                             |
| <b><i>Other</i></b>            | None Present                                                                                            |
| <b>Rail Network</b>            | None Present                                                                                            |
| <b>Cycle Network</b>           | NCN 1                                                                                                   |
| <b>Bus Services</b>            | 522A                                                                                                    |



Table 13-5: Proposed WSR Section of the EIA Scoping Area

|                                |                                                                 |
|--------------------------------|-----------------------------------------------------------------|
| <b>SRN</b>                     | A140, B1077, B1077 Stuston Lane                                 |
| <b>LRN</b>                     | Eye Road, Mellis Road                                           |
| <b>Temporary Access</b>        | From either A140, Eye Road or Stuston Lane                      |
| <b>Permanent Access</b>        | From either A140, Eye Lane, Mellis Road or Unnamed Road         |
| <b>Crossing of HGV Network</b> | Yes                                                             |
| <b>PRoW</b>                    |                                                                 |
| <b>Footpath</b>                | W-522/006/A, W-522/009/0, W-165/008/0, W-165/010/0, W-505/005/0 |
| <b>Bridleway</b>               | W-522/013/0                                                     |
| <b>Other</b>                   | None Present                                                    |
| <b>Rail Network</b>            | None Present                                                    |
| <b>Cycle Network</b>           | None Present                                                    |
| <b>Bus Services</b>            | 75, 482                                                         |

Table 13-6: Proposed AWRP to River Waveney Pipeline Section of the EIA Scoping Area

|                                |                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SRN</b>                     | A47, A143, A146, B1074 Blundeston Road                                                                                                                                                                                                                                                                                                                                                                |
| <b>LRN</b>                     | Flixton Road, Market Lane, Waddling Lane, Burgh Road, Station Road, Church Lane, Waterheath Road, Beccles Road, Wood Lane, Hollow Way Hill, Dogs Lane, Raveningham Road                                                                                                                                                                                                                               |
| <b>Temporary Access</b>        | Yes                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Permanent Access</b>        | No                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Crossing of HGV Network</b> | Yes                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>PRoW</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Footpath</b>                | Geldeston FP6, Gillingham FP9, Aldeby FP9, Aldeby FP6, Aldeby FP10, Aldeby FP11, Burgh St Peter FP6, Burgh St Peter FP1, E-142/020/0, E-142/015/0, E-471/010/0, E-471/012/0, E-142/003/0, E-142/019/0, E-142/006/0, E-142/006/A, E-142/007/0, E-142/007/A, E-142/008/0, E-384/006/0, Aldeby BR3, Aldeby FP6, Aldeby FP7, Toft Monks FP13, Gillingham FP3, Stockton BR4, Stockton FP10, Gillingham FP4 |
| <b>Bridleway</b>               | Gillingham BR1                                                                                                                                                                                                                                                                                                                                                                                        |

|                      |                                                                                                    |
|----------------------|----------------------------------------------------------------------------------------------------|
| <b>Other</b>         | Geldeston RB2 (Restricted Byway), Stockton RB6 (Restricted Byway), Stockton RB7 (Restricted Byway) |
| <b>Rail Network</b>  | Norwich – Lowestoft Line                                                                           |
| <b>Cycle Network</b> | RCN 31                                                                                             |
| <b>Bus Services</b>  | X1, 1, 1A                                                                                          |

Table 13-7: Proposed Barsham WTW to CSR Pipeline Section of the EIA Scoping Area

|                                |                                                                                                                                                                                                                                                                                              |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SRN</b>                     | A144 Halesworth Road, B1117 Halesworth Road,                                                                                                                                                                                                                                                 |
| <b>LRN</b>                     | Ringsfield Road, Church Road, Beccles Green Lane, Hall Lane, Grub Lane, Wash Lane, Halesworth Road, Wissett Lane, Mill Road, Chediston Street, Walpole Road, Unnamed Road between Walpole Lane and Halesworth Road, Walpole Lane                                                             |
| <b>Temporary Access</b>        | Yes                                                                                                                                                                                                                                                                                          |
| <b>Permanent Access</b>        | No                                                                                                                                                                                                                                                                                           |
| <b>Crossing of HGV Network</b> | Yes                                                                                                                                                                                                                                                                                          |
| <b>PRoW</b>                    |                                                                                                                                                                                                                                                                                              |
| <b>Footpath</b>                | E-448/008/A, E-448/012/0, E-337/004/0, E-337/001/0, E-337/002/0, E-339/007/0, E-339/009/0, E-339/010/0, E-485/001/0, E-485/007/0, E-485/011/0, E-569/009/0, E-569/006/0, E-569/005/0, E-187/016/0, E-569/011/0, E-569/003/0, E-290/012/0, E-187/008/0, E-538/010/0, E-538/017/0, E-538/018/0 |
| <b>Bridleway</b>               | E-448/014/0, E-448/008/0, E-485/004/0, E-538/015/0                                                                                                                                                                                                                                           |
| <b>Other</b>                   | None Present                                                                                                                                                                                                                                                                                 |
| <b>Rail Network</b>            | None Present                                                                                                                                                                                                                                                                                 |
| <b>Cycle Network</b>           | NCN 1, RCN 40                                                                                                                                                                                                                                                                                |
| <b>Bus Services</b>            | 524, X41, 99A, 522                                                                                                                                                                                                                                                                           |

Table 13-8: Proposed CSR to WSR Pipeline Section of the EIA Scoping Area

|            |                                                                                                                                                                                                                                                                                  |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SRN</b> | B1117, B1117 Rowe's Hill, B1116, B1117 Cookley Road, B1118, A140                                                                                                                                                                                                                 |
| <b>LRN</b> | Halesworth Road, Dunwich Lane, Heveningham Long Lane, Unnamed Road between Rowe's Hill and Badingham Road, Badingham Road, Deningham Road, Framlingham Road, Wilby Lane, London City Road, Worlingworth Road, Athelington Road, Redlingfield Road, Low Road, The Street, Unnamed |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | Road between Hoxne Road and Eye Road, Brome Avenue, Nick's Lane, Eye Road                                                                                                                                                                                                                                                                                                                                                     |
| <b>Temporary Access</b>        | Yes                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Permanent Access</b>        | No                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Crossing of HGV Network</b> | Yes                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>PRoW</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Footpath</b>                | E-314/014/0, E-314/026/0, E-314/001/0, E-314/018/0, E-314/021/0, E-314/023/0, E-533/008/0, E-360/021/0, E-360/028/0, E-360/029/0 E-221/007/0, E-168/036/0, E-168/039/0, E-564/006/0, E-564/005/0, E-564/020/A, E-564/024/0, E-500/038/0, E-328/002/0, E-328/010/0, E-328/009/0, W-219/007/0, W-219/010/0, W-219/012/0, W-239/029/0, W-239/029/0, W-239/027/0, W-239/034/0, W-165/009/0, W-165/007/0, W-165/008/0, W-165/010/0 |
| <b>Bridleway</b>               | E-328/004/0, E-564/002/0                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Other</b>                   | W-219/013/0 (Restricted Byway), W-330/029/0 (Restricted Byway)                                                                                                                                                                                                                                                                                                                                                                |
| <b>Rail Network</b>            | None Present                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Cycle Network</b>           | RCN 30                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Bus Services</b>            | 482, 75A                                                                                                                                                                                                                                                                                                                                                                                                                      |

Table 13-9: Proposed CSR to Saxmundham Pipeline Section of the EIA Scoping Area

|                                |                                                                                                                                                                                                                |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SRN</b>                     | A1120 Yoxford Road, B1119 Rendham Road, A12                                                                                                                                                                    |
| <b>LRN</b>                     | Unnamed Road between Dunwich Lane and New Road, Pump House Lane, Rendham Road, Unnamed Road between Peasenhall Road and B1119 Rendham Road, Lincoln Avenue, Seaman Avenue                                      |
| <b>Temporary Access</b>        | Yes                                                                                                                                                                                                            |
| <b>Permanent Access</b>        | No                                                                                                                                                                                                             |
| <b>Crossing of HGV Network</b> | Yes                                                                                                                                                                                                            |
| <b>PRoW</b>                    |                                                                                                                                                                                                                |
| <b>Footpath</b>                | E-469/004/0, E-469/001/0, E-469/008/0, E-469/012/0, E-469/013/0, E-469/018/0, E-469/017/0, E-443/010/0 E-443/012/0, E-443/014/0, E-443/016/0, E-344/005/0, E-460/010/0, E-460/007/0, E-460/005/0, E-460/006/0, |

|                      |                                                                |
|----------------------|----------------------------------------------------------------|
|                      | E-137/019/0 E-137/020/0, E-460/014/0, E-460/011/0, E-460/013/0 |
| <b>Bridleway</b>     | E-443/013/0                                                    |
| <b>Other</b>         | None Present                                                   |
| <b>Rail Network</b>  | East Suffolk Line                                              |
| <b>Cycle Network</b> | NCN 1                                                          |
| <b>Bus Services</b>  | 522A                                                           |

Table 13-10: Proposed Saxmundham to SZC Pipeline Section of the EIA Scoping Area

|                                |                                                                                                                                                            |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SRN</b>                     | A12, B1121 Main Road, B1122                                                                                                                                |
| <b>LRN</b>                     | Tiggins Lane, Butchers Road, Lowes Hill, Harrow Lane, Moat Road, Eastbridge Road                                                                           |
| <b>Temporary Access</b>        | Yes                                                                                                                                                        |
| <b>Permanent Access</b>        | No                                                                                                                                                         |
| <b>Crossing of HGV Network</b> | Yes                                                                                                                                                        |
| <b>PRoW</b>                    |                                                                                                                                                            |
| <b>Footpath</b>                | E-344/008/0, E-344/010/0, E-344/020/0, E-344/021/0, E-344/033/0, E-515/003/0, E-515/001/0, E-515/003/0, E-515/004/0, E-515/013/0, E-515/012/0, E-515/011/0 |
| <b>Bridleway</b>               | E-363/019/0                                                                                                                                                |
| <b>Other</b>                   | None Present                                                                                                                                               |
| <b>Rail Network</b>            | East Suffolk Line                                                                                                                                          |
| <b>Cycle Network</b>           | None Present                                                                                                                                               |
| <b>Bus Services</b>            | 522, 522A, 522B 521, 64                                                                                                                                    |

Table 13-11: Proposed Eastern Distribution Mains Section of the EIA Scoping Area

|                                |                                                                                                          |
|--------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>SRN</b>                     | A140                                                                                                     |
| <b>LRN</b>                     | Eye Road, Mellis Road, Unnamed Road between Mellis Road and Earlsford Road, Earlsford Road, Rectory Road |
| <b>Temporary Access</b>        | Yes                                                                                                      |
| <b>Permanent Access</b>        | No                                                                                                       |
| <b>Crossing of HGV Network</b> | Yes                                                                                                      |

|                      |                                         |
|----------------------|-----------------------------------------|
| <b>PRoW</b>          |                                         |
| <b>Footpath</b>      | W-583/002/0, W-583/003/0, W-389/006/0   |
| <b>Bridleway</b>     | W-267/023/0, W-246/010/0                |
| <b>Other</b>         |                                         |
| <b>Rail Network</b>  | Adjacent to the Great Eastern Main Line |
| <b>Cycle Network</b> | RCN 30                                  |
| <b>Bus Services</b>  | 75A                                     |

Table 13-12: Proposed Western Distribution Mains Section of the EIA Scoping Area

|                                |                                                |
|--------------------------------|------------------------------------------------|
| <b>SRN</b>                     | B1113 Walsham Road, B1113 Station Road         |
| <b>LRN</b>                     | Finningham Road, Gislingham Road, Wickham Road |
| <b>Temporary Access</b>        | Yes                                            |
| <b>Permanent Access</b>        | No                                             |
| <b>Crossing of HGV Network</b> | Yes                                            |
| <b>PRoW</b>                    |                                                |
| <b>Footpath</b>                | W-246/008/0, W-246/013/0                       |
| <b>Bridleway</b>               | W-246/007/0, W-246/015/0                       |
| <b>Other</b>                   | W-246/022/0 (Byway Open to All Traffic)        |
| <b>Rail Network</b>            | Adjacent to the Great Eastern Main Line        |
| <b>Cycle Network</b>           | None Present                                   |
| <b>Bus Services</b>            | VC001                                          |

## 13.5 Likely Significant Effects

- 13.5.1 When defining and assessing the likely significant traffic and access effects resulting from the construction, operational and decommissioning phases of the Proposed Development, activities related to a particular component will be considered.
- 13.5.2 These activities will be described in full within the traffic and access chapter of the ES and are briefly summarised in Table 13-13 to indicate those that will generate vehicle movements of plant, materials, equipment and staff. As such, these vehicle movements will generate traffic and access impacts and are therefore to be assessed for the significance of their effects.

Construction traffic will be directed to use the most appropriate routes to access the Proposed Development. The preferred HGV routes within the administrative area of SCC are shown in Figure 13-3, which is indicative at this scoping stage.

Table 13-13: Activities Likely to Generate Vehicle Movement by Phase of the Proposed Development

| Component                                                                   | Activities generating and influencing vehicle movement by Phase                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | Construction Phase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Operational Phase                                                                                                                                                                                                     | Decommissioning Phase                                                                                                                                                                                                                                                                                                                                                                                    |
| Proposed pumping station (a subsidiary component) at existing Lowestoft WRC | <ul style="list-style-type: none"> <li>Delivery, installation and commissioning of pumping equipment and associated housing within existing compound.</li> </ul>                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>Minor uplift in planned and reactive management and maintenance of additional infrastructure as part of current WTW operations.</li> </ul>                                     | <ul style="list-style-type: none"> <li>Decommissioning would be part of a broader WTW decommissioning. These works would not be part of the Proposed Development.</li> </ul>                                                                                                                                                                                                                             |
| Proposed pipeline components, including their air valves and wash-outs      | <ul style="list-style-type: none"> <li>Enabling, construction, installation and commissioning of pipeline and associated inspection and maintenance infrastructure. Various construction methods, plant, and equipment; in-bound materials requirements; phasing and transient works; limited out-bound materials.</li> <li>Establishment and removal of temporary compounds and laydown, access bellmouths and crossings; internal haul roads; traffic management at works locations.</li> </ul> | <ul style="list-style-type: none"> <li>Infrequent inspections, monitoring, and maintenance.</li> <li>Short-term management of interfaces with inspection and maintenance areas and public travel activity.</li> </ul> | <ul style="list-style-type: none"> <li>Decommission in situ of above ground infrastructure.</li> <li>Establishment and removal of temporary compounds, access bell mouths and crossings; internal access routes; traffic management at works locations.</li> <li>Management of temporary interfaces between working areas and public travel activity.</li> <li>Removal of permanent accesses.</li> </ul> |

| Activities generating and influencing vehicle movement by Phase |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Component                                                       | Construction Phase                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Operational Phase                                                                                                                         | Decommissioning Phase                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                 | <ul style="list-style-type: none"> <li>• Movement of workers and programming of workforce numbers.</li> <li>• Management of temporary interfaces between working areas and public travel activity.</li> <li>• Interactions between concurrent and consecutive working areas.</li> <li>• Formation of permanent access for maintenance and inspections.</li> </ul>                                                                                                                          |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Proposed AWRP and associated infrastructure                     | <ul style="list-style-type: none"> <li>• Enabling, construction and commissioning of water recycling plant and associated accesses at new compound.</li> <li>• Establishment of medium-term secure working area.</li> <li>• Movement of workers and programming of workforce numbers.</li> <li>• Management of temporary and permanent interfaces between working areas, new plant, and public networks.</li> <li>• Interactions between concurrent and adjacent working areas.</li> </ul> | <ul style="list-style-type: none"> <li>• Daily movements of staff and materials.</li> <li>• Planned and unplanned maintenance.</li> </ul> | <ul style="list-style-type: none"> <li>• Dismantling and potential removal of above and below ground and surface level infrastructure.</li> <li>• Establishment and removal of temporary compounds, access bell mouths, traffic management at works locations.</li> <li>• Management of temporary interfaces between working areas and public travel activity.</li> <li>• Possible removal of permanent accesses.</li> </ul> |



| Activities generating and influencing vehicle movement by Phase |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Component                                                       | Construction Phase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Operational Phase                                                                                                                                                                                                     | Decommissioning Phase                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                 | <ul style="list-style-type: none"> <li>Formation of permanent access for operations, maintenance, inspections, and emergencies.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                         |
| Proposed LSO (Option 1)                                         | <ul style="list-style-type: none"> <li>Enabling, construction, installation and commissioning of pipeline and associated inspection and maintenance infrastructure. Various construction methods, plant, and equipment; in-bound materials requirements; phasing and transient works; limited out-bound materials.</li> <li>Establishment and removal of temporary compounds and laydown, access bellmouths and crossings; internal haul roads; traffic management at works locations.</li> <li>Movement of workers and programming of workforce numbers.</li> <li>Management of temporary interfaces between working areas and public travel activity.</li> <li>Interactions between concurrent and consecutive working areas.</li> </ul> | <ul style="list-style-type: none"> <li>Infrequent inspections, monitoring, and maintenance.</li> <li>Short-term management of interfaces with inspection and maintenance areas and public travel activity.</li> </ul> | <ul style="list-style-type: none"> <li>Decommission in situ of above ground infrastructure.</li> <li>Establishment and removal of temporary compounds, access bellmouths and crossings; internal access routes; traffic management at works locations.</li> <li>Management of temporary interfaces between working areas and public travel activity.</li> <li>Removal of permanent accesses.</li> </ul> |

| Component                     | Activities generating and influencing vehicle movement by Phase                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | Construction Phase                                                                                                                                                                                                                                                                                                                                                                                                                                             | Operational Phase                                                                                                                                                                                                         | Decommissioning Phase                                                                                                                                                                                                                                                                                                                                                                                            |
|                               | <ul style="list-style-type: none"> <li>• Formation of permanent access for maintenance and inspections.</li> <li>• Mobilisation of marine and riparian activities to launch, install and commission sub-sea pipeline.</li> <li>• Marine and land movements of water-based plant, materials, equipment, and workers.</li> <li>• Management of interfaces between shoreline activities.</li> </ul>                                                               |                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Proposed LSO (Options 2 or 3) | <ul style="list-style-type: none"> <li>• Enabling, construction, installation and commissioning of pipeline and associated inspection and maintenance infrastructure. Various construction methods, plant, and equipment; in-bound materials requirements; phasing and transient works; limited out-bound materials.</li> <li>• Establishment and removal of temporary compounds and laydown, access bellmouths and crossings; internal haul roads;</li> </ul> | <ul style="list-style-type: none"> <li>• Infrequent inspections, monitoring, and maintenance.</li> <li>• Short-term management of interfaces with inspection and maintenance areas and public travel activity.</li> </ul> | <ul style="list-style-type: none"> <li>• Decommission in situ of above ground infrastructure.</li> <li>• Establishment and removal of temporary compounds, access bell mouths and crossings; internal access routes; traffic management at works locations.</li> <li>• Management of temporary interfaces between working areas and public travel activity.</li> <li>• Removal of permanent accesses.</li> </ul> |

| Component                                          | Activities generating and influencing vehicle movement by Phase                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                       |                                                                                                                                                                                         |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                    | Construction Phase                                                                                                                                                                                                                                                                                                                                                                                       | Operational Phase                                                                                                                     | Decommissioning Phase                                                                                                                                                                   |
|                                                    | traffic management at works locations. <ul style="list-style-type: none"> <li>• Movement of workers and programming of workforce numbers.</li> <li>• Management of temporary interfaces between working areas and public travel activity.</li> <li>• Interactions between concurrent and consecutive working areas.</li> <li>• Formation of permanent access for maintenance and inspections.</li> </ul> |                                                                                                                                       |                                                                                                                                                                                         |
| Proposed WSR and CSR and associated infrastructure | <ul style="list-style-type: none"> <li>• Refer to proposed AWRP and associated infrastructure above.</li> </ul>                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• Refer to proposed AWRP and associated infrastructure above but at a lesser scale.</li> </ul> | <ul style="list-style-type: none"> <li>• Refer to proposed AWRP and associated infrastructure above.</li> </ul>                                                                         |
| Connections at existing water towers and WTW       | <ul style="list-style-type: none"> <li>• Minor works to establish piped connections to existing infrastructure.</li> <li>• Management of temporary interfaces between working areas and public networks.</li> </ul>                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Negligible change in operational activities.</li> </ul>                                      | <ul style="list-style-type: none"> <li>• Decommissioning would be part of a broader WTW or tower decommissioning. These works would not be part of the Proposed Development.</li> </ul> |

\*Items shaded in grey represent vehicle movements that are considered negligible in volume or generated by works that would not be part of the Proposed Development.

- 
- 13.5.3 The size, scale and nature of the Proposed Development require several parameters to inform the assessment of the significance of its traffic and access effects. These parameters comprise:
- The type of network user group – walkers, cyclists, horse riders, public transport, maritime traffic, private vehicles, commercial traffic, and goods traffic.
  - The phase of the Proposed Development – construction, operational, or decommissioning.
  - The form of interface between the Proposed Development and the affected network.
  - The spatial extent of the Proposed Development.
  - The temporal period of the impact – duration, seasonality, time of day.
  - In-combination effects – assessment of likely significant in-combination effects with other environmental topics.
  - Cumulative effects – assessment of the Proposed Development’s likely significant traffic and access effects with other projects.
  - Sensitivity of receptors.
- 13.5.4 The significance of effects will be evaluated using empirical data, stakeholder information and professional judgement.
- 13.5.5 To inform the scoping and assessment of traffic and access effects, a typology of highway interfaces has been defined, as set out in Table 13-14. This typology provides a consistent framework for understanding the characteristics of each interface and for applying professional judgement in the assessment of impacts and the subsequent determination of the magnitude and significance of effects.
- 13.5.6 Table 13-15 considers the components of the Proposed Development, its phase and whether the likely impacts of each are proposed to be scoped in or out of the assessment.
- 13.5.7 Through an initial appraisal of the type of interface and the construction or decommissioning activities at each location, professional judgement will be applied as to whether to further conclude that the effects at those locations would be of no greater than minor adverse significance. As such, no further assessment would be required at those locations.
-

Table 13-14: Highway Interface Typology

| Ref. | Format                                                              | Characteristics                                                                                                                                                                                                                                         |
|------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MWC  | Main works compound (inc. office/welfare)                           | <ul style="list-style-type: none"> <li>Highway access for variety of vehicles – materials, plant, worker, visitor.</li> <li>Broad activity time including start-up / close-down.</li> <li>Typically, priority controlled.</li> </ul>                    |
| SC   | Secondary compounds (laydown, satellite, trenchless, commissioning) | <ul style="list-style-type: none"> <li>Highway access for high proportion construction vehicles.</li> <li>Moderate or frequent use during construction hours.</li> <li>Typically, priority controlled.</li> </ul>                                       |
| AM   | Works access                                                        | <ul style="list-style-type: none"> <li>Highway access for construction vehicles only.</li> <li>Moderate or frequent use during construction hours.</li> <li>Typically managed by marshals.</li> <li>Typically, priority controlled.</li> </ul>          |
| HR   | Haul road crossing point                                            | <ul style="list-style-type: none"> <li>Cross movements with no turning access from the highway.</li> <li>Frequent or infrequent use during construction hours.</li> <li>Typically, mobile traffic signal controlled with marshal attendance.</li> </ul> |
| Hyb  | Hybrid crossing                                                     | <ul style="list-style-type: none"> <li>Combined works highways access with haul road crossing.</li> <li>Frequent or infrequent use during construction hours.</li> <li>Typically, mobile traffic signal controlled with marshal attendance.</li> </ul>  |
| TPL  | Open trenched pipeline crossing                                     | <ul style="list-style-type: none"> <li>Open cut trenched crossings of highway with associated temporary traffic management.</li> </ul>                                                                                                                  |
| UPL  | Trenchless pipeline crossing                                        | <ul style="list-style-type: none"> <li>Subsurface crossing with no highway openings – served by local trenchless operation secondary compounds.</li> </ul>                                                                                              |
| PAC  | Permanent access                                                    | <ul style="list-style-type: none"> <li>Formal access point for all operational traffic. configured to adoptable standards.</li> </ul>                                                                                                                   |

13.5.8 At interfaces with the PRow network, construction activities could require localised re-alignments, either temporarily or permanently. Those re-alignments could require the study area to extend beyond the EIA Scoping Area. A typology for the interfaces between the construction traffic and the walking, cycling and horse-riding network is set out at Table 13-15. The consideration of the interface typology will facilitate an assessment of the

likely impacts which will be carried through to the assessment of the significance of effects.

- 13.5.9 It is anticipated that the effects of the low number of traffic movements forecast to be generated during the operational phase of the Proposed Development would be localised to the travel network close to the proposed AWRP, WSR and CSR components.

Table 13-15: PRoW/Cycle/Bridleway Interface Typology

| Ref. | Format              | Characteristics                                                                                                                                                                                                                                                 |
|------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PRC  | Crossing point      | <ul style="list-style-type: none"> <li>Interface with PRoW or cycle route.</li> <li>May involve pedestrians, cyclists and/or equestrians.</li> <li>May require safe crossing provision, managed with signs, traffic marshals or controlled crossing.</li> </ul> |
| PRD  | Diversion route     | <ul style="list-style-type: none"> <li>Temporary diversion of PRoW or cycle route around works area.</li> <li>Would maintain connectivity and safety for users.</li> <li>Requires clear wayfinding and suitable surface.</li> </ul>                             |
| PRP  | Permanent interface | <ul style="list-style-type: none"> <li>Formalised crossing or access point relocated or reinstated post-construction.</li> <li>Designed to appropriate standards for PRoW and cycle network continuity.</li> </ul>                                              |

### Marine and Riparian Network

- 13.5.10 The scope of the assessment will include consideration of marine and riparian network interactions during the construction phase of the Proposed Development. Although there is no direct interface with the Port of Lowestoft, the port will be included within the assessment of impacts, including consideration of opportunities to utilise riparian services for the supply and transportation of construction materials. An appraisal of the potential use of marine transportation and riparian facilities during construction will be included within the TA. A Navigation Risk Assessment will be undertaken and used to inform the traffic and access chapter of the ES.
- 13.5.11 At this scoping stage, it is anticipated that crossings of rivers and navigable watercourses will be undertaken using trenchless construction techniques.

This embedded design assumption is intended to minimise direct interaction with navigations and reduce the potential for adverse effects on marine and riparian users. Construction routeing and worksite arrangements will be planned to minimise impacts on the Broads National Park, and the implications of these measures will be reflected in the assessment reported in the ES.

**Bus Network**

- 13.5.12 The effect on bus services will be managed through appropriate traffic management measures during the Proposed Development’s construction and decommissioning phases to minimise disruption to scheduled services. Options for temporary diversions or controlled crossings will be considered where necessary.

**13.6 Impacts Scoped Out of the Assessment**

- 13.6.1 Considering the approach to the assessment of impacts set out in Section 13.5 above, the provisional forecast of likely significant effects is expected to occur through the periods and locations indicated in Table 13-16. This indicates where traffic movements are expected to derive interactions with the wider travel networks such that a perceptible change in movements could be identified. The assessment of those changes will determine whether the significance of effects is significant and is greater than of minor adverse significance. The provisional appraisal is based on professional judgement, including the appreciation that aspects of the Proposed Development are existing infrastructure and will not generate new or increased traffic movements and will not alter the effects on travel networks.

Table 13-16: Scoping Assessment of the Proposed Development’s Components

| Component                  | Construction Phase | Operational Phase                  | Decommissioning Phase                 |
|----------------------------|--------------------|------------------------------------|---------------------------------------|
| <b>Proposed AWRP</b>       |                    |                                    |                                       |
| AWRP                       | Scoped in          | Scoped in                          | Scoped in                             |
| New pumping station at the | Scoped in          | Scoped out – de minimis change in. | Scoped out – would be decommissioned. |

| Component                                                                                                                                                                                                                                                                                      | Construction Phase | Operational Phase                                                                                            | Decommissioning Phase                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| existing Lowestoft WRC                                                                                                                                                                                                                                                                         |                    | existing vehicle movements at the Lowestoft WRC.                                                             | as part of existing Lowestoft WRC, should this occur.                                          |
| <b>Proposed LSO</b>                                                                                                                                                                                                                                                                            |                    |                                                                                                              |                                                                                                |
| LSO                                                                                                                                                                                                                                                                                            | Scoped In          | Scoped out (LSO) – negligible effects anticipated.                                                           | Scoped out (LSO) – negligible effects anticipated.                                             |
| <b>Proposed Service Reservoirs</b>                                                                                                                                                                                                                                                             |                    |                                                                                                              |                                                                                                |
| CSR and WSR                                                                                                                                                                                                                                                                                    | Scoped in          | Scoped in                                                                                                    | Scoped in                                                                                      |
| <b>Proposed Pipelines</b>                                                                                                                                                                                                                                                                      |                    |                                                                                                              |                                                                                                |
| <ul style="list-style-type: none"> <li>Lowestoft WRC to AWRP</li> <li>AWRP to River Waveney</li> <li>Barsham WTW to CSR Pipeline</li> <li>Barsham WTW to CSR to Walpole WTW Pipeline</li> <li>CSR to WSR</li> <li>CSR to Saxmundham Pipeline water tower</li> <li>Saxmundham to SZC</li> </ul> | Scoped in          | Scoped out – fixed below-ground asset with infrequent visits and associated low volume of vehicle movements. | Scoped out – de minimis vehicle movements associated with above-ground infrastructure removal. |
| <b>Proposed Distribution Mains</b>                                                                                                                                                                                                                                                             |                    |                                                                                                              |                                                                                                |
| <ul style="list-style-type: none"> <li>Eastern Distribution Mains</li> <li>Western Distribution Mains</li> </ul>                                                                                                                                                                               | Scoped In          | Scoped out – fixed below-ground asset with infrequent visits and associated low volume of vehicle movements. | Scoped out – de minimis vehicle movements associated with above-ground infrastructure removal. |



- 13.6.2 For the Proposed Development's components which are proposed to be scoped out of the assessment of likely significant effects during either its construction, operational or decommissioning phases, it has been judged that the significance of the component's effects during that phase on the environmental impact criteria would be minor adverse, negligible or neutral and therefore not significant.
- 13.6.3 In summary, the components of the Proposed Development that are proposed to be scoped out of the assessment in the ES comprise:
- Existing assets which require very minor or no construction works to connect to the Proposed Development (such as the Barsham WTW). These components are therefore proposed to be scoped out of the assessment of the Proposed Development's construction, operational and decommissioning phases due to the very few traffic movements that would be generated.
  - Modifications to existing assets (such as the Lowestoft WRC) which, following construction works that would generate some additional vehicle movements (which is scoped into the appraisal of impacts), will be operated with negligible changes to existing operational vehicle movements and would not be decommissioned as part of the Proposed Development. These components are therefore proposed to be scoped out of the assessment of the Proposed Development's operational and decommissioning phases.
  - The proposed pipelines which will have extremely infrequent inspections and maintenance visits during the operational phase of the Proposed Development and will generate very few traffic movements during its decommissioning phase due to the majority of the below-ground asset (i.e. the pipes) being retained in situ on decommissioning. These components are therefore proposed to be scoped out of the assessment of the Proposed Development's operational and decommissioning phases.
- 13.6.4 The maritime and riparian traffic effects associated with the operational and decommissioning phases of the Proposed Development are anticipated to be negligible, reflecting the limited nature of activities during these phases and are proposed to be scoped out of the assessment in the ES. This includes any changes to the existing hydrological regime of watercourses during the operational phase of the Proposed Development, which are not expected to result in likely significant effects on traffic and access receptors.

- 13.6.5 During the operational and decommissioning phases of the Proposed Development, there would be no planned disruption to the rail network. Impacts on the rail network from the operational and decommissioning phases are therefore proposed to be scoped out of the assessment in the ES.

## **13.7 Proposed Approach to Mitigation**

### **Primary (Inherent) Mitigation**

- 13.7.1 Through the design evolution, balanced judgements will be taken on the locations of the infrastructure for the Proposed Development. The consideration of options includes selecting pipeline corridors that optimise the reduction in challenging travel network interfaces and selecting locations for the proposed AWRP, WSR and CSR components which allow robust connections to the travel network to allow safe and efficient access for people, plant, equipment and materials for the construction, operational and decommissioning phases of the Proposed Development.
- 13.7.2 Concept design parameters also propose using trenchless pipeline construction at locations where it is considered that open-cut construction would generate substantial disruption, such as at railways and navigable channels. At this scoping stage, it is expected that 'A' classified and main 'B' classified roads will be considered for trenchless construction crossings, depending on the likely significance of effects across all environmental impact criteria. This trenchless technique seeks to minimise disruption but is balanced with several factors including efficiency and viability, particularly noting the need to establish launch and receptor locations.
- 13.7.3 The siting of the Proposed Development's components will be informed by the need to seek to minimise impacts on the travel networks whilst also considering other environmentally sensitive receptors, including in respect of biodiversity and landscape and views.

- 13.7.4 The primary traffic and access mitigation measures will be set out within the traffic and access chapter of the ES. At this scoping stage, the measures outlined represent the likely mitigation measures anticipated.

### Secondary (Foreseeable) Mitigation

- 13.7.5 An Outline Construction Traffic Management Plan ('OCTMP') will be prepared to support the DCO application and accord with best practice. It will identify measures to mitigate or minimise the impacts of the construction and decommissioning phases of the Proposed Development. The measures are anticipated to include, but not be limited to:

- Adherence to designated vehicle routes.
- Use of a Delivery Management System and a commitment to avoid network peak hours for deliveries where possible, as well as school drop off and pick up times where necessary.
- A commitment to, if relevant, seeking to coordinate deliveries with other developments in the area.
- Vehicle site entry and exit in forward gear and requirement for engines to be switched off on-site when not in use.
- Provision of site compounds, including an appropriate number of parking spaces.
- Signing to direct construction vehicles.
- Wheel cleaning facilities.
- Creation of temporary vehicle passing bays (if appropriate and necessary).
- Dust suppression at working areas.
- Vehicles carrying waste material off-site to be sheeted.
- Component prefabrication if appropriate, safe and efficient.
- Re-use of material on-site where practicable.
- Traffic marshals and gate staff to be provided at site access points and PRow, where appropriate, to ensure the safe movement of construction vehicles.
- Site management contact details on notice boards for the local communities.
- The agreement to undertake a pre and post construction highway condition survey at agreed locations.
- A system of engagement with local affected stakeholders.

- Implementation by the Principal Contractor of the Framework Construction Worker Travel Plan ('FCWTP') and a detailed Construction Traffic Management Plan ('CTMP').
- 13.7.6 Internal haul routeing is accounted for within the evolving Order Limits. This allows the internalisation of some construction traffic movements but must be balanced with the efficient delivery of the Proposed Development and the potential addition of materials and plant to create the haul routes.
- 13.7.7 The secondary traffic and access mitigation measures will be set out within the ES. At this scoping stage, the measures outlined represent the likely mitigation approaches anticipated.

### Tertiary (Inexorable) Mitigation

- 13.7.8 Adherence to the legislation as listed in Appendix 13.1 associated with the movement of people, plant, materials and equipment will inform the design of the Proposed Development, including during the construction and potential decommissioning activities associated with the Proposed Development.
- 13.7.9 For example, this includes confirming the requirements of visibility at access points in accordance with the Design Manual for Roads and Bridges CD 123 [6], Geometric design of at-grade priority and signal-controlled junctions (2021) and CD 116 Geometric design of roundabouts [7] and the safe working areas at roadworks considering Traffic Signs Manual Chapter 8 [8], the Construction (Design and Management) Regulations [9] and the New Roads and Street Works Act [10]. This also includes adherence to best practice schemes for vehicle standards and driver training.
- 13.7.10 In addition, there are established management practices for large (abnormal) loads including the requirement for movement orders, use of specialist hauliers, stakeholder notification procedures, routeing assessments and police escorts (where necessary) that could be implemented for the Proposed Development, as required. Notification systems such as Electronic Service Delivery for Abnormal Loads ('ESDAL') can be used for this purpose.

- 13.7.11 The tertiary traffic and access mitigation measures will be set out within the traffic and access chapter of the ES. At this scoping stage, the measures outlined represent the likely mitigation approaches anticipated.
- 13.7.12 Informed by assessments to be provided through the traffic and access chapter of the ES and the TA, and the ‘cautious ‘worst case’’ scenario, a suite of management plans will be submitted in support of the DCO application to provide the framework for governing, monitoring and managing the construction and decommissioning phases. The suite of management plans relating to traffic and access will most likely comprise:
- OCTMP.
  - Outline Public Rights of Way Management Plan (‘OPRoWMP’).
  - Framework Construction Worker Travel Plan (‘FCWTP’).
  - Outline Decommissioning Traffic Management Plan (‘ODTMP’).
- 13.7.13 These management plans would inform and be informed by other management plans including the Code of Construction Practice (‘CoCP’), Outline Construction Environmental Management Plan (‘OCEMP’) and the Outline Decommissioning Environmental Management Plan (‘ODEMP’).

## 13.8 Proposed Approach to the ES

### Assessment Methodology

- 13.8.1 The assessment approach will comprise a review of an initial long-list of potentially affected receptors and users. The significance of effects will be evaluated using empirical data, stakeholder information and professional judgement informed by available desk-based data. Receptors where no greater than minor adverse, minor beneficial, neutral or negligible effects are deemed to occur will be scoped out of further assessment in the ES, with supporting justification provided.
- 13.8.2 The long-list could include strategic roads and PRow on the margins of the study area, where conglomeration of traffic movements associated with the Proposed Development might generate a greater than minor adverse, and therefore significant, effect. This will typically be established through

assessment of the ‘*cautious ‘worst case’’* construction period scenario forecast annual average daily traffic movements from the Proposed Development, as distributed across the road network.

- 13.8.3 The forecast traffic movements for the ‘*cautious ‘worst case’’* operational phase of the Proposed Development will be generated, and a similar distribution network spreadsheet will be compiled, albeit noting that the movements associated with the operational pipeline components will be de minimis and would result in negligible effects and their assessment is proposed to be scoped out of the traffic and access chapter of the ES. An assessment of the operational traffic impacts of the non-pipeline components of the Proposed Development is proposed to be scoped into the assessment in the traffic and access chapter of the ES.

### Appraisal of Impacts

- 13.8.4 The Proposed Development’s impacts on the environmental impact criteria set out in the Institute of Sustainability and Environmental Professionals’ (‘ISEP’) (formerly the Institute of Environmental Management and Assessment) Environmental Assessment of Traffic and Movement (2023) [11] guidelines (‘the ISEP Guidelines’) have been considered. These criteria comprise:

- Accidents and safety.
- Severance.
- Driver delay.
- Pedestrian delay (incorporating delay to all non-motorised users).
- Pedestrian amenity (including fear and intimidation).
- Hazardous/large loads.

### Accidents and Safety

- 13.8.5 The ISEP Guidelines do not include any definition in relation to the assessment of effects on accidents and safety, advising that professional judgement should be used to assess the implications of local circumstance, or factors which may increase or decrease the risk of accidents.

- 13.8.6 Personal Injury Crash ('PIC') records of the past five years will be obtained from data published by the DfT data sets. This will indicate locations of clusters and hotspots. Where necessary, further data will be obtained from the LHAs and SHA, which will provide more information to assess the level of effect for accidents and safety as a result of the Proposed Development.

### Severance

- 13.8.7 The ISEP Guidelines define severance as *'the perceived division that can occur within a community when it becomes separated by major traffic infrastructure'* (paragraph 3.13) that *'separates people from places and other people'*. An example would be difficulty crossing a heavily trafficked road, or the physical barrier created by infrastructure.
- 13.8.8 There are a range of indicators for determining the significance of effects resulting from changes in severance. The ISEP Guidelines suggest that *'changes in traffic flow of 30%, 60% and 90% are regarded as producing slight, moderate and substantial changes in severance respectively'* (paragraph 3.16). These guidelines also note that *'although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law. However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic'* (paragraph 3.16).
- 13.8.9 The ISEP Guidelines also note that *'at a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact'* (paragraph 2.18). Subsequently, proportionate changes in traffic flow from a low base flow are not in themselves justification for significance. For roads with existing low traffic flows, a marginal change in the volume of traffic flow on the road due to a proposed development can derive a greater percentage change than for roads with higher existing traffic flows. Due to the absence of sensitive receptors along the access route, however, the change in vehicle traffic



would not be judged to derive a significant impact within an assessment in an ES.

13.8.10 As set out in Section 13.4, a combination of empirical traffic data (including walkers, cyclists and equestrians) and data obtained from local traffic models will be used to inform appraisal of impacts at key locations within the study area to derive current traffic flows. This baseline assessment will be supported by the trip-generation and distribution estimates that are to be carried out for the Proposed Development's construction, operational and decommissioning phases. The results of this analysis will generate the percentage change in traffic flow, allowing severance to be assessed in the ES. The traffic flow data and trip generation forecasts derived from analysis will also be used to inform the assessments presented in the noise and vibration, air quality and odour, socio-economics and human health chapters of the ES. Additional pedestrian, equestrian and cyclist data will also be collected, as considered appropriate to assess the effects on those network users.

13.8.11 The assessment of the Proposed Development's likely significant effects on severance will be considered with respect to any effects on road links and PRow within the study area. Any relevant mitigation measures in relation to the movement of walkers, cyclists and horse riders will be stated in the ES and also within the TA and OCTMP to be prepared in support of the DCO application.

#### *Driver Delay*

13.8.12 The ISEP Guidelines state that '*delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system*' (paragraph 3.20). As such, the impact of a proposed development on driver delay is typically considered in relation to background traffic.

13.8.13 Engagement with the LHAs and the SHA and an assessment of empirical and modelled data will confirm whether the Proposed Development is likely



to affect driver delay by means of adding additional vehicles on links during its construction, operational and decommissioning phases.

*Pedestrian Delay (incorporating delay to all non-motorised users)*

13.8.14 The ISEP Guidelines state that *‘the assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads’* (paragraph 3.23). The ISEP Guidelines subsequently state *‘it is not considered wise to set down definitive thresholds. Instead, it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect’* (paragraph 3.26).

13.8.15 Similar to the approach to the driver delay impact criterion, engagement with the LHAs and an assessment of data will provide sufficient evidence to identify effects on the network, including any effects on PRoW within the study area. Further discussions with the LHAs will additionally allow information to be collected on any specific links within the study area which may require further assessment or mitigation with respects to pedestrian delay. Additional pedestrian data may also be collected, if considered appropriate.

13.8.16 If it is identified that the impacts of the construction or decommissioning phases of the Proposed Development could significantly affect delays to cyclist and horse-riders, then the same approach will be adopted to consider delays to those users.

*Pedestrian Amenity (including Fear and Intimidation)*

13.8.17 Pedestrian amenity is broadly defined in the ISEP Guidelines as *‘the relative pleasantness of a journey’* (paragraph 3.29) and can be affected by traffic flow, composition, and footway width/separation from traffic. The definition includes pedestrian fear and intimidation and can be considered a much broader category when considering the overall relationship between pedestrians and traffic. The ISEP Guidelines suggest that a threshold for

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judging this would be *‘where the traffic flow (or its HGV component) is halved or doubled’* (paragraph 3.30).

- 13.8.18 Similar to the approach to the driver and pedestrian delay impact criteria, engagement with the LHAs and SHA and an assessment of data will provide sufficient evidence to identify effects on the network. This engagement with the LHAs and SHA will additionally allow information to be collected on any specific links within the study area which may require further assessment or mitigation with respects to pedestrian amenity. Consideration will also be given to other non-motorised road users, such as cycling and horse-riding.

#### *Hazardous/Large Loads*

- 13.8.19 The ISEP Guidelines state that some developments include hazardous and large (abnormal) loads, and that this should be recognised as an environmental impact criterion. An Abnormal Indivisible Load (‘AIL’) is typically classified as a vehicle which exceeds 44 tonnes Gross Vehicle Weight, or its width is more than 2.9m, or its rigid length is more than 18.65m.
- 13.8.20 There will be a limited number of AILs to transport items for the Proposed Development, such as large excavators or mobile cranes. The number of AIL movements will be low and is not forecast to be significant.
- 13.8.21 There are established management practices including the requirement for movement orders, use of specialist hauliers, stakeholder notification procedures, routing assessments and police escorts (where necessary) that could be implemented for the Proposed Development, as required. Notification systems such as ESDAL can be used for this purpose.
- 13.8.22 There will be a limited number of hazardous loads anticipated as part of the operational phase of the Proposed Development, specifically for the proposed AWRP component for the delivery of chemicals for water treatment. However, the carriage of these materials will not generate a

significant effect. It is proposed to scope out an assessment of the effects of hazardous/large loads from the traffic and access chapter of the ES.

### Magnitude of Change

13.8.23 Table 13-17 sets out the criteria to be used to assess the magnitude of effect of the forecast impacts. That magnitude will in turn inform whether an effect is to be deemed to have a significance that requires further assessment and mitigation.

Table 13-17: Magnitude of Change Assessment Criteria

| Environmental Impact Criteria | Assessment Criteria for Determining the Magnitude of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Severance                     | <p>The ISEP Guidelines set out a range of indicators for determining the magnitude of severance effects. It suggests changes in traffic flows and associated magnitude of impacts as:</p> <ul style="list-style-type: none"> <li>• &lt;30% - negligible magnitude of change.</li> <li>• 30-60% - small magnitude of change.</li> <li>• 60-90% - medium magnitude of change.</li> <li>• &gt;90% - large magnitude of change.</li> </ul>                                                                                                                                                                                                                                                                                                                                            |
| Driver Delay                  | <p>The ISEP Guidelines do not provide set thresholds for determining when a change in driver delay is likely to be significant and instead refers to any junction capacity assessments that may be undertaken, alongside professional judgement.</p> <p>It is proposed to use professional judgement and the overall changes in traffic flows with reference to the typical ISEP Guidelines' thresholds (&lt;30% is negligible, 30-60% is small, 60-90% is medium and &gt;90% is large), to determine whether there is likely to be any significant changes to driver delay. If needed, local traffic modelling will be used better to understand the magnitude of effect. The need or otherwise for traffic modelling will be concluded in engagement with the LHAs and SHA.</p> |
| Pedestrian Delay              | <p>The ISEP Guidelines recommend the use of professional judgement to determine whether pedestrian delay is significant across individual links, taking into consideration the varying characteristics of local conditions within the study area. For the purposes of this assessment, the following thresholds related to changes in total traffic are applied alongside professional judgement and interpretations of the local conditions:</p> <ul style="list-style-type: none"> <li>• &lt;30% - negligible magnitude of change.</li> <li>• 30-60% - small magnitude of change.</li> </ul>                                                                                                                                                                                    |

| Environmental Impact Criteria | Assessment Criteria for Determining the Magnitude of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <ul style="list-style-type: none"> <li>• 60-90% - medium magnitude of change.</li> <li>• &gt;90% - large magnitude of change.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Non-Motorised User Amenity    | <p>The ISEP Guidelines note that a tentative threshold for determining significance of changes in non-motorised user amenity is when traffic flows are halved or doubled (which would lead to a high magnitude of impact). A change of less than a quarter would represent a low impact and a change more than a quarter would present a medium impact. However, the guidelines note that any changes should be considered with professional judgement in light of the local conditions.</p> <p>It is proposed to use these thresholds alongside professional judgement taking into consideration the likely demand and provisions for non-motorised users across the links.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Fear and Intimidation         | <p>Table 3-1 of the ISEP Guidelines refers to an assessment for the 'degree of hazard' to assess fear and intimidation. Each road link in the study area will be assessed to determine the values of these parameters using traffic data. These values will then be compared to the thresholds defined in Table 3-1 of the ISEP Guidelines to determine the degree of hazard score, from 0 up to 30.</p> <p>In determining the degree of hazard, the assessment will apply a score based on three parameters:</p> <ul style="list-style-type: none"> <li>• Average daily vehicle flows - this covers the total volume of all vehicles across an 18-hour period from a road link. Higher volumes indicate a greater hazard.</li> <li>• Total HGV flows - the total volume of HGVs over an 18-hour day. A higher HGV volume represents a greater perceived hazard.</li> <li>• Average speeds - the mean speed of vehicles on the road link. Higher speeds are associated with greater hazard.</li> </ul> <p>Once calculated, the total hazard score will be presented to determine the level of fear and intimidation, as follows:</p> <ul style="list-style-type: none"> <li>• 0-20 - small.</li> <li>• 21-40 - moderate.</li> <li>• 41-70 - great.</li> <li>• 71+ - extreme.</li> </ul> <p>A comparison of the degree of hazard will be undertaken for the Proposed Development's peak construction year with/without the construction flows and against the baseline traffic flows to determine any changes.</p> <p>Step changes are defined as increases in average daily traffic or heavy vehicle flow compared to baseline. A low step change is an increase of &lt;400 vehicles/day or &lt;500 heavy vehicles/day. A</p> |

| Environmental Impact Criteria | Assessment Criteria for Determining the Magnitude of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <p>medium step change is an increase of &gt;400 vehicles/day or &gt;500 heavy vehicles/day. A high step change is two increases in separate flow thresholds from baseline.</p> <p>The magnitude of impact will then be determined as follows:</p> <ul style="list-style-type: none"> <li>• Negligible - no step change from baseline.</li> <li>• Low - one step change from baseline (&lt;400 vehicle trip increase).</li> <li>• Medium - one step change from baseline (&gt;400 daily vehicle trip increase).</li> <li>• High - two step changes from baseline.</li> </ul>                                                                                                               |
| Road Safety                   | <p>The ISEP Guidelines suggest that the magnitude of road safety impacts will be related to identifying collision clusters and collision rates through a detailed review of baseline characteristics to determine road safety and sensitivity. However, it does not provide any defined thresholds. Instead, the ISEP Guidelines advise that professional judgement should be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents occurring. In addition, the ISEP Guidelines refer to the use of a Stage 1 Road Safety Audit to determine the suitability of any transport and access related works that are proposed.</p> |
| Hazardous and Large Loads     | <p>The ISEP Guidelines do not set specific thresholds for the consideration of hazardous and/or large loads, only that professional judgement should be utilised based on their frequency and nature.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

13.8.24 In the traffic and access chapter of the ES, the magnitude of change and receptor sensitivity will be compared to determine the overall significance of effects. This is shown in Table 13-18. There are five categories which outline the significant of the effect:

- Neutral: No change from baseline conditions.
- Negligible: Very little change from baseline conditions.
- Minor: A minor shift away from baseline conditions.
- Moderate: A material shift away from baseline conditions.
- Major: Substantial alteration to baseline conditions.

Table 13-18: Significance of Potential Effects

| Impact Magnitude | Receptor Sensitivity |                    |                    |            |
|------------------|----------------------|--------------------|--------------------|------------|
|                  | High                 | Medium             | Low                | Negligible |
| High             | Major                | Major/<br>Moderate | Moderate           | Low        |
| Medium           | Major/<br>Moderate   | Moderate           | Moderate/<br>Minor | Low        |
| Low              | Moderate             | Moderate/<br>Minor | Minor              | Negligible |
| Negligible       | Moderate/<br>Minor   | Minor              | Negligible         | Negligible |

13.8.25 Additionally, these effects may be positive (beneficial) or negative (adverse).

13.8.26 It is noted that the ISEP Guidelines state that the assessment of environmental effects arising from road traffic requires professional judgement. This is particularly the case for the assessments of effects on non-motorised users where local characteristics need to be fully considered.

13.8.27 It is considered that only moderate and major effects are significant for the purposes of the assessment in the ES. Effects can be temporary or permanent and short, medium or long term in duration. The definitions of these are as follows:

- A short-term effect – an effect that will be experienced for up to 1 years
- A medium-term effect – an effect that will be experienced for 1-5 years.
- A long-term effect – an effect that will be experienced for 5 years or longer.

### Mitigation and Residual Effects

13.8.28 The traffic and access chapter of the ES will assess effects both with and without mitigation measures:

- Pre-mitigation effects (or 'unmitigated effects'): effects that would occur in the absence of any mitigation.
- Residual effects: effects that remain after the implementation of mitigation measures (primary, secondary, and tertiary), representing the 'cautious 'worst case'' effect.

13.8.29 As set out in Section 13.6 above, the assessment will distinguish between:

- Primary (inherent) mitigation: design features integrated into the Proposed Development.
- Secondary (foreseeable) mitigation: measures designed to reduce likely significant effects.
- Tertiary (inexorable) mitigation: measures required by legislation, policy, or standard best practice.

13.8.30 Where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES.

### **In-combination Effects**

13.8.31 The assessment will consider potential in-combination effects where traffic-related impacts interact with other environmental topics that would result in a greater overall effect on a single sensitive receptor. For example, increased traffic flows may lead to elevated noise and air quality impacts at sensitive receptors such as residential properties, schools, and healthcare facilities. These combined effects could be more significant than each impact assessed in isolation. This will also inform the assessments presented in the noise and vibration, air quality and odour, socio-economics and human health chapters of the ES.

13.8.32 The assessment will also consider downstream effects, where increased congestion could exacerbate local air quality issues or contribute to cumulative noise impacts in areas already subject to high baseline levels. Similarly, traffic management measures introduced during the construction phase that may interact with pedestrian and cyclist accessibility, influencing community severance and social impacts.

13.8.33 The approach will involve identifying receptors that are likely to experience multiple impacts (e.g., noise, air quality, and traffic safety) and assess whether the combined magnitude of these effects could result in a higher level of significance. This will be informed by baseline data, analysis/modelling outputs, and professional judgement, ensuring that

potential cumulative and synergistic effects are appropriately scoped for detailed assessment in the traffic and access chapter of the ES.

## Limitations and Assumptions

13.8.34 At this scoping stage, these limitations and assumptions apply:

- Baseline data availability: traffic data is assumed to be representative of typical conditions based on the most recent datasets available. Data will be sourced from relevant data sets including the SCTM and local counts or surveys.
- Future year forecasting: assumptions regarding growth factors and committed developments will be based on information available on the planning portal, current local plan allocations and TEMPro forecasts.

## 13.9 Summary of Impacts and Effects

13.9.1 Table 13-19 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the traffic and access chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.



Table 13-19: Summary of Traffic and Access Scope

| Receptor                  | Effects                                                                                                                                                                                                                                      | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                    | Scoped in/Scoped out |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Construction Phase</b> |                                                                                                                                                                                                                                              |                       |                                      |                                                |                                                                                                                               |                      |
| People at home            | Potential reduction in pedestrian amenity (including fear and intimidation) due to temporary increases in noise, dust, vibration and visual intrusion. Minor implications for severance and accidents and safety from construction activity. | High - Low            | High                                 | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• FCWTP.</li> <li>• OCEMP.</li> </ul> | Scoped in            |
| People in workplaces      | Reduced pedestrian amenity from noise, dust; access restrictions resulting in severance, and potential accidents and safety risks                                                                                                            | High - Low            | High - Low                           | Significant                                    | None required.                                                                                                                | Scoped in            |

| Receptor                                                                        | Effects                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                    | Scoped in/Scoped out |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                                                                                 | associated with nearby construction.                                                                                                                                                                            |                       |                                      |                                                |                                                                                                                               |                      |
| Sensitive and/or vulnerable groups including children, the elderly and disabled | Increased severance due to changes in access and crossing points; greater sensitivity to pedestrian delay; reduced pedestrian amenity (including fear and intimidation); elevated accident and safety concerns. | High - Low            | High                                 | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• FCWTP.</li> <li>• OCEMP.</li> </ul> | Scoped in            |
| Sensitive locations (e.g. hospitals, churches, schools, historical building)    | Potential severance where access is constrained; reduced pedestrian amenity due to noise/vibration; localised accident                                                                                          | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• FCWTP.</li> <li>• OCEMP.</li> </ul> | Scoped in            |

| Receptor       | Effects                                                                                                                                                                                                                                                        | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                        | Scoped in/Scoped out |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                | and safety considerations.                                                                                                                                                                                                                                     |                       |                                      |                                                |                                                                                                                                                   |                      |
| People walking | Route diversions resulting in severance and increased pedestrian delay. Reduced safety/amenity near works.                                                                                                                                                     | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• OPRoWMP.</li> <li>• FCWTP.</li> <li>• OCEMP.</li> </ul> | Scoped in            |
| People cycling | Diversions and temporary route changes resulting in severance and increased non-motorised users delay; reduced pedestrian amenity (including fear and intimidation) due to interaction with construction traffic and potential for accidents and safety risks. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• OPRoWMP.</li> <li>• FCWTP.</li> <li>• OCEMP.</li> </ul> | Scoped in            |

| Receptor                                        | Effects                                                                                                                                                                 | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                      | Scoped in/Scoped out |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------|
| People horse riding                             | Disruption to routes causing severance; reduced pedestrian amenity (including fear and intimidation) from noise and movement of plant/vehicles; potential safety risks. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• OPRoWMP.</li> <li>• FCWTP.</li> </ul> | Scoped in            |
| Open spaces, recreational sites, shopping areas | Reduced accessibility resulting in severance; decline in pedestrian amenity affecting user experience and footfall.                                                     | High - Low            | High - Low                           | Not Significant                                | None required.                                                                                                                  | Scoped Out           |
| Sites of ecological/ nature conservation value  | Physical and functional severance of habitats; indirect effects on                                                                                                      | High - Low            | High                                 | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• OCEMP.</li> </ul>                     | Scoped in            |

| Receptor                             | Effects                                                                                                                                                                                                                      | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                      | Scoped in/Scoped out |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                                      | environmental quality.                                                                                                                                                                                                       |                       |                                      |                                                |                                                                                                                                 |                      |
| Sites of tourist/ visitor attraction | Reduced accessibility (severance) and increased pedestrian delay; decline in pedestrian amenity affecting visitor experience.                                                                                                | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• OPRoWMP.</li> <li>• OCEMP.</li> </ul> | Scoped in            |
| Vehicle drivers and passengers       | Increased driver delay due to traffic management, congestion and diversions; potential accidents and safety impacts from altered layouts; interaction with hazardous/ large loads where construction traffic is significant. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• FCWTP.</li> <li>• OCEMP.</li> </ul>   | Scoped in            |

| Receptor                    | Effects                                                                                                                                                                                                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                    | Scoped in/Scoped out |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Public transport passengers | Increased driver delay (affecting bus journey times) and some pedestrian delay where stops are relocated; minor severance where access to stops changes; reduced pedestrian amenity.<br>Potential impacts on rail services resulting from engineering works close to the railway lines or additional freight services connected to the Proposed Development affecting existing rail timetables. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• OCTMP.</li> <li>• FCWTP.</li> <li>• OCEMP.</li> </ul> | Scoped in            |
| Marine Traffic              | Potential disruption to                                                                                                                                                                                                                                                                                                                                                                         | High - Low            | High - Low                           | Significant                                    | Measures set out in the below:                                                                                                | Scoped In            |

| Receptor                 | Effects                                                                                                                                                                                                                           | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                               | Scoped in/Scoped out |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|--------------------------------------------------------------------------|----------------------|
|                          | vessel movements, navigation routes and port operations and access to marine infrastructure.                                                                                                                                      |                       |                                      |                                                | <ul style="list-style-type: none"> <li>OCTMP.</li> <li>OCEMP.</li> </ul> |                      |
| <b>Operational Phase</b> |                                                                                                                                                                                                                                   |                       |                                      |                                                |                                                                          |                      |
| People at home           | Potential reduction in pedestrian amenity (including fear and intimidation) due to increases in noise, dust, vibration and visual intrusion. Minor implications for severance and accidents and safety from operational activity. | Very Low              | Low                                  | Not Significant                                | None required.                                                           | Scoped Out           |
| People in workplaces     | Reduced pedestrian amenity from                                                                                                                                                                                                   | Very Low              | Low                                  | Not Significant                                | None required.                                                           | Scoped Out           |

| Receptor                                                                        | Effects                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|----------------------------|----------------------|
|                                                                                 | noise, dust; permanent access restrictions resulting in severance, and potential accidents and safety risks associated with nearby construction.                                                                |                       |                                      |                                                |                            |                      |
| Sensitive and/or vulnerable groups including children, the elderly and disabled | Increased severance due to changes in access and crossing points; greater sensitivity to pedestrian delay; reduced pedestrian amenity (including fear and intimidation); elevated accident and safety concerns. | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |
| Sensitive locations                                                             | Potential severance where                                                                                                                                                                                       | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |



| Receptor                                                 | Effects                                                                                                                                               | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|----------------------------|----------------------|
| (e.g. hospitals, churches, schools, historical building) | access is constrained; reduced pedestrian amenity due to noise/vibration; localised accident and safety considerations.                               |                       |                                      |                                                |                            |                      |
| People walking                                           | Route diversions resulting in severance and increased pedestrian delay. Reduced safety/amenity during operation.                                      | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |
| People cycling                                           | Diversions and permanent route changes resulting in severance and increased non-motorised users delay; reduced pedestrian amenity (including fear and | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |

| Receptor                                        | Effects                                                                                                                                                                 | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|----------------------------|----------------------|
|                                                 | intimidation) due to interaction with operational traffic and potential for accidents and safety risks.                                                                 |                       |                                      |                                                |                            |                      |
| People horse riding                             | Disruption to routes causing severance; reduced pedestrian amenity (including fear and intimidation) from noise and movement of plant/vehicles; potential safety risks. | High - Low            | Low                                  | Significant                                    | None required.             | Scoped In            |
| Open spaces, recreational sites, shopping areas | Reduced accessibility resulting in severance; decline in pedestrian amenity affecting user experience and footfall.                                                     | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |

| Receptor                                       | Effects                                                                                                                                     | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|----------------------------|----------------------|
| Sites of ecological/ nature conservation value | Physical and functional severance of habitats; indirect effects on environmental quality.                                                   | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |
| Sites of tourist/ visitor attraction           | Reduced accessibility (severance) and increased pedestrian delay; decline in pedestrian amenity affecting visitor experience.               | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |
| Vehicle drivers and passengers                 | Increased driver delay due to increases in traffic, congestion and diversions; potential accidents and safety impacts from altered layouts. | Low                   | Low                                  | Not Significant                                | None required.             | Scoped Out           |

| Receptor                    | Effects                                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|----------------------------|----------------------|
| Public transport passengers | Increased driver delay (affecting bus journey times) and some pedestrian delay where stops are relocated; minor severance where access to stops changes; reduced pedestrian amenity.<br>No impact on rail services anticipated. | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |
| Marine Traffic              | Potential disruption to vessel movements, navigation routes and port operations and access to marine infrastructure.                                                                                                            | Very Low              | Low                                  | Not Significant                                | None required.             | Scoped Out           |

| Receptor                     | Effects                                                                                                                                                                                                                                      | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                  | Scoped in/Scoped out |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Decommissioning Phase</b> |                                                                                                                                                                                                                                              |                       |                                      |                                                |                                                                                                             |                      |
| People at home               | Potential reduction in pedestrian amenity (including fear and intimidation) due to temporary increases in noise, dust, vibration and visual intrusion. Minor implications for severance and accidents and safety from construction activity. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• ODTMP.</li> <li>• ODEMP.</li> </ul> | Scoped In            |
| People in workplaces         | Reduced pedestrian amenity from noise, dust; access restrictions resulting in severance, and potential accidents and safety risks associated with                                                                                            | Low                   | Low                                  | Not Significant                                | None required.                                                                                              | Scoped Out           |

| Receptor                                                                        | Effects                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                  | Scoped in/Scoped out |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------|
|                                                                                 | nearby construction.                                                                                                                                                                                            |                       |                                      |                                                |                                                                                                             |                      |
| Sensitive and/or vulnerable groups including children, the elderly and disabled | Increased severance due to changes in access and crossing points; greater sensitivity to pedestrian delay; reduced pedestrian amenity (including fear and intimidation); elevated accident and safety concerns. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• ODTMP.</li> <li>• ODEMP.</li> </ul> | Scoped In            |
| Sensitive locations (e.g. hospitals, churches, schools, historical building)    | Potential severance where access is constrained; reduced pedestrian amenity due to noise/vibration; localised accident                                                                                          | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• ODTMP.</li> <li>• ODEMP.</li> </ul> | Scoped In            |

| Receptor       | Effects                                                                                                                                                                                                                                                        | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                  | Scoped in/Scoped out |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------|
|                | and safety considerations.                                                                                                                                                                                                                                     |                       |                                      |                                                |                                                                                                             |                      |
| People walking | Route diversions resulting in severance and increased pedestrian delay. Reduced safety/amenity near works.                                                                                                                                                     | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• ODTMP.</li> <li>• ODEMP.</li> </ul> | Scoped In            |
| People cycling | Diversions and temporary route changes resulting in severance and increased non-motorised users delay; reduced pedestrian amenity (including fear and intimidation) due to interaction with construction traffic and potential for accidents and safety risks. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• ODTMP.</li> <li>• ODEMP.</li> </ul> | Scoped In            |

| Receptor                                        | Effects                                                                                                                                                                 | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|----------------------------|----------------------|
| People horse riding                             | Disruption to routes causing severance; reduced pedestrian amenity (including fear and intimidation) from noise and movement of plant/vehicles; potential safety risks. | Low                   | Low                                  | Not Significant                                | None required.             | Scoped Out           |
| Open spaces, recreational sites, shopping areas | Reduced accessibility resulting in severance; decline in pedestrian amenity affecting user experience and footfall.                                                     | Low                   | Low                                  | Not Significant                                | None required.             | Scoped Out           |
| Sites of ecological/ nature conservation value  | Physical and functional severance of habitats; indirect effects on                                                                                                      | Low                   | Low                                  | Not Significant                                | None required.             | Scoped Out           |



| Receptor                             | Effects                                                                                                                                                                                                                      | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                  | Scoped in/Scoped out |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------|
|                                      | environmental quality.                                                                                                                                                                                                       |                       |                                      |                                                |                                                                                                             |                      |
| Sites of tourist/ visitor attraction | Reduced accessibility (severance) and increased pedestrian delay; decline in pedestrian amenity affecting visitor experience.                                                                                                | Low                   | Low                                  | Not Significant                                | None required.                                                                                              | Scoped Out           |
| Vehicle drivers and passengers       | Increased driver delay due to traffic management, congestion and diversions; potential accidents and safety impacts from altered layouts; interaction with hazardous/ large loads where construction traffic is significant. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• ODTMP.</li> <li>• ODEMP.</li> </ul> | Scoped In            |

| Receptor                    | Effects                                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance / Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                  | Scoped in/Scoped out |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------|
| Public transport passengers | Increased driver delay (affecting bus journey times) and some pedestrian delay where stops are relocated; minor severance where access to stops changes; reduced pedestrian amenity.<br>No impact on rail services anticipated. | High - Low            | High - Low                           | Significant                                    | Measures set out in the below: <ul style="list-style-type: none"> <li>• ODTMP.</li> <li>• ODEMP.</li> </ul> | Scoped In            |
| Marine Traffic              | Potential disruption to vessel movements, navigation routes and port operations and access to marine infrastructure.                                                                                                            | Very Low              | Low                                  | Not Significant                                | None required.                                                                                              | Scoped Out           |

## 14 Noise and Vibration

### 14.1 Introduction

- 14.1.1 This chapter describes the proposed scope and approach which will be undertaken for the assessment of the likely significant effects resulting from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on noise and vibration. The assessment will be presented within an Environmental Statement (‘ES’) submitted with the application for a Development Consent Order (‘DCO’). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.
- 14.1.2 The EIA Scoping Area is shown on Figure 1-1. This chapter should be read in conjunction with the following chapters of this Scoping Report:
- Chapter 2 The Proposed Development.
  - Chapter 3 EIA Methodology.
  - Chapter 7 Freshwater Biodiversity.
  - Chapter 8 Marine Biodiversity.
  - Chapter 11 Water Environment.
- 14.1.3 Noise and vibration have been scoped into the ES due to the potential for likely significant effects from the Proposed Development to occur. This chapter provides an initial overview of the baseline context, potential for effects, the scope and methodology of assessment, potential mitigation and any assumptions, limitations or uncertainties.
- 14.1.4 This chapter only considers effects on human noise and vibration sensitive receptors (‘NVSRs’) and vibration impacts on buildings.
- 14.1.5 The Proposed Development may result in potentially significant noise and vibration effects at ecological receptors. These receptors are considered in

chapter 6 terrestrial biodiversity, chapter 7 freshwater biodiversity and chapter 8 marine biodiversity of this Scoping Report.

- 14.1.6 Noise impacts on archaeological and cultural heritage assets are considered in chapter 11 terrestrial historic environment and chapter 12 marine historic environment of the Scoping Report. Chapter 10 landscape and visual considers effects on tranquillity, which could include noise impacts.
- 14.1.7 This chapter has been prepared by an Acoustic Engineer who has over 20 years' experience of preparing assessments under the requirements of the EIA Regulations. They are a member of the Institute of Acoustics ('MIOA') and have an MEng (Hons) in Mechanical Engineering.
- 14.1.8 Appendix 14.1 to this chapter sets out the relevant legislation, policy and guidance relevant to noise and vibration. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

## 14.2 Study Area

### Construction Noise

#### Direct Impacts

- 14.2.1 Guidance on study areas is provided in National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 111 Noise and Vibration (2020) Revision 2 [1] ('the DMRB LA 111 Guidance'). The DMRB LA 111 Guidance was published as guidance for highway schemes; however, the construction noise and vibration study area it sets out is derived from general principles of noise and vibration propagation, rather than the specific construction activity or development type. As such, its use to define the construction study areas for the Proposed Development is considered appropriate, as the DMRB LA 111 Guidance comprises best practice guidance.

- 14.2.2 In relation to construction noise, the DMRB LA 111 Guidance advises in paragraph 3.5 1 that:

*‘A study area of 300m from the closest construction activity is normally sufficient to encompass noise sensitive receptors.’*

#### Indirect Impacts

- 14.2.3 With regards to construction traffic, the DMRB LA 111 Guidance advises that a construction traffic study area should be defined to include a 50m width from the kerb line of public roads, where there are roads with potential for an increase in baseline noise level of 1 decibel level that has been corrected for the A-Weighting curve dB(A) or more, as a result of the addition of a proposed development’s construction traffic to existing traffic levels. The study area includes the road links where construction traffic movements are expected as a result of the Proposed Development’s construction phase.

### Construction Vibration

#### Direct Impacts

- 14.2.4 In relation to construction vibration, the DMRB LA 111 Guidance advises in paragraph 3.29 that:

*‘A study area of 100m from the closest construction activity with the potential to generate vibration is normally sufficient to encompass vibration sensitive receptors.’*

### Operational Noise

#### Direct Impacts

- 14.2.5 In relation to operational noise effects from the Proposed Development, the study area for plant noise impacts will be considered on noise sensitive receptors within a 1km radius of the EIA Scoping Area. A 1km radius is considered suitable for the potential noise emitters during the operation of the Proposed Development based on professional experience. As a guide, BREEAM [2], which is a globally recognised sustainability assessment and

certification system for a range of building uses including industrial use requires assessment of receptors within 800m of fixed plant.

- 14.2.6 The study area will be refined as the design of the Proposed Development evolves. However, it is anticipated that the study area for the ES will be the proposed Order Limits plus a 1km from the proposed Order Limits as described above.

## **Operational Vibration**

### **Direct Impacts**

- 14.2.7 Based on professional judgement, the operational vibration study area, will be 100m from operational activities with the potential to generate vibration. Beyond 100m, vibration impacts, specifically vibration dose value ('VDV'), are likely to be below levels which are considered to be significant.

## **Decommissioning Noise**

### **Direct Impacts**

- 14.2.8 For the decommissioning phase of the Proposed Development, the study area will be the same as that utilised for the construction phase study area as decommissioning is expected to involve construction type activities and no further operational noise activities.

## **Decommissioning Vibration**

### **Direct Impacts**

- 14.2.9 For the decommissioning phase of the Proposed Development, the study area will be the same as that utilised for the construction phase study area as decommissioning is expected to involve construction type activities and no further operational vibration activities.

## **14.3 Consultation and Engagement**

- 14.3.1 Engagement has commenced with the Environmental Health departments of the relevant Local Planning Authorities ('LPAs') with regards to the baseline sound survey methodology.

- 14.3.2 Further engagement and consultation with the Environmental Health Officers ('EHOs') at East Suffolk Council ('ESC'), Mid Suffolk District Council ('MSDC'), South Norfolk District Council ('SNDC'), Great Yarmouth Borough Council ('GYBC') and the Broads Authority ('BA') will be undertaken to inform the assessment in the noise and vibration chapter of the ES, seeking to agree the proposed approach to the noise and vibration assessment.

## 14.4 Baseline Environment

- 14.4.1 This section provides a summary of baseline conditions in respect of noise and vibration, including the presence of NVSRs, comprising residential and other sensitive uses, such as schools, parks and places of worship.
- 14.4.2 In the absence of environmental sound survey data at this scoping stage, strategic noise mapping data has been used to give an indication of baseline sound levels within the study areas. The strategic noise mapping has been published by the Department for the Environment, Food and Rural Affairs ('Defra') as part of implementing the Environmental Noise Directive ('END') implemented in England by The Environmental Noise (England) Regulations 2006 (as amended) [3] and shows predicted railway and road traffic sound levels in the vicinity of major transportation routes.
- 14.4.3 The noise baseline within the study areas is described by reference to the following principal components of the Proposed Development, also referred to as 'sections of the EIA Scoping Area':
- Proposed Advanced Water Recycling Advanced Water Recycling Plant ('AWRP').
  - Proposed Long Sea Outfall ('LSO').
  - Proposed Central Service Reservoir ('CSR').
  - Proposed Western Service Reservoir ('WSR').
  - Proposed AWRP to River Waveney Pipeline.
  - Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
  - Proposed CSR to WSR Pipeline.
  - Proposed CSR to Saxmundham Pipeline.

- Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

### Proposed Advanced Water Recycling Plant

- 14.4.4 The proposed AWRP section of the EIA Scoping Area is located within a predominantly rural area comprising agricultural land, with existing infrastructure including a major road corridor, the A47, located immediately east of this section.
- 14.4.5 NVSRs are primarily residential properties located to the east of this section of the EIA Scoping Area and within the study area, beyond the A47, forming part of a more densely developed area in Hopton-on-Sea. Additional isolated NSVRs within the study area, including farmsteads and residential dwellings, are located directly adjacent to the proposed AWRP section of the EIA Scoping Area. These include dwellings adjacent to the north of the scoping area, and residential dwellings along Jay Lane approximately 30m to the south, off Linen Post Lane approximately 135m to the west and off Yarmouth Road (A47) approximately 170m to the east.
- 14.4.6 Environmental sound levels in the study area for the proposed AWRP component are expected to be dominated by traffic on the surrounding road network, predominantly the A47. Strategic noise mapping indicates sound levels at the closest NVSRs range from 45 to 65 dB  $L_{Aeq,16h}$ , depending on proximity to these roads. Intermittent sound is expected from maintenance and the working of surrounding fields/farmland.
- 14.4.7 The proposed pumping station at Lowestoft Water Recycling Centre ('WRC') (a subsidiary component of the Proposed Development) would be located within the proposed AWRP section of the EIA Scoping Area. It comprises a small parcel of land located within the existing operational facility, surrounded by agricultural land and areas of woodland.
- 14.4.8 The nearest NVSRs to the proposed pumping station at Lowestoft WRC (within the proposed AWRP section of the EIA Scoping Area and its study



area) are residential dwellings located along Stirrups Lane, the nearby settlement of Corton located approximately 500m to the south-east, and Broadland Sands Holiday Park located approximately 430m to the north-east of this section, respectively.

- 14.4.9 The environmental sound climate at the location of the proposed pumping station at Lowestoft WRC (within the proposed AWRP section of the EIA Scoping Area) is expected to be dominated by sound from the existing surrounding WRC and traffic movements on the A47 and Stirrups Lane. Intermittent sound associated with the operation of Skillz Bike Park, located at Woburn Farm, approximately 200m to the north of this section is expected to be audible during operational periods.

### Proposed LSO

- 14.4.10 The proposed LSO section of the EIA Scoping Area is adjacent to the residential areas of Hopton-on Sea, Corton and Lowestoft. It contains Pleasurewood Hills Family Theme Park and Gunton Woodland Burial Park.
- 14.4.11 The baseline sound climate in the study area for the proposed three options of the LSO section of the EIA Scoping Area is expected to be dominated by traffic movements along the A47, the B1385 and local roads in Lowestoft. Noise associated with Pleasurewood Hills Family Theme Park is expected to dominate in surrounding areas during operating hours (approximately 10:00 to 17:00). Intermittent sound associated with industrial uses in Lowestoft may occur in the southern part of this section.

### Proposed CSR

- 14.4.12 The proposed CSR section of the EIA Scoping Area is located in predominantly open agricultural land within a rural setting.
- 14.4.13 NSVRs within the study area comprise a limited number of isolated residential dwellings located adjacent to local roads to the south and east (including those at Sibton Green), as well as scattered farmsteads to the north and west. These NSVRs are expected to experience low levels of ambient sound, with minimal influence from major transportation

infrastructure. Strategic noise mapping indicates sound levels at the closest NVSRs in the study area for this section of the EIA Scoping Area range from less than 40 to 60 dB  $L_{Aeq,16h}$ , depending on proximity to the local roads, including Dulwich Lane and Peasenhall Road.

- 14.4.14 The main sources of environmental sound within the study area for this section of the EIA Scoping Area are likely to be associated with local road traffic on minor surrounding roads, together with intermittent agricultural activity and occasional movements associated with nearby rural properties.

### Proposed WSR

- 14.4.15 The proposed WSR section of the EIA Scoping Area comprises predominantly agricultural land located within a rural setting. The surrounding area is characterised by open fields, scattered farmsteads and small settlements, including Brome, Thrandeston and Great Green.
- 14.4.16 Various NVSRs across the study area are located adjacent to the proposed WSR section of the EIA Scoping Area. Within the study area of the eastern portion of this section of the EIA Scoping Area, NVSRs comprise dwellings within Brome and the mobile home park at Four Oaks Park. Dwellings along Great Green, Abbey Close are located adjacent to the western portion of this section. Isolated dwellings within Thrandeston are also located within the study area for the proposed WSR section of the EIA Scoping Area.
- 14.4.17 The baseline sound environment is influenced by both rural and transportation sources. The A140, located to the east of the proposed WSR section of the EIA Scoping Area, represents the primary source of environmental sound. Additional sources are likely to include traffic on local roads, intermittent agricultural activities, and occasional sound associated with the operation of nearby commercial premises in Mid Suffolk Business Park.
- 14.4.18 Strategic noise mapping indicates sound levels at the closest NVSRs within the study area range from less than 40 to 65 dB  $L_{Aeq,16h}$ , depending on proximity to the local roads.

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### **Proposed AWRP to River Waveney Pipeline**

- 14.4.19 The proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area runs through the residential areas of Hopton, Blundeston and Waterheath. Areas of Bull's Green, Gillingham, Burgh St Peter, and Geldestone alongside isolated dwellings also fall within the study area of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area.
- 14.4.20 The environmental sound climate at the eastern extent of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area is likely to be dominated by road traffic on the A47, whilst the A143 and A146 are expected to dominate in the central area and western extent. In areas located farther from these roads, it is expected that road traffic from intermediary roads and intermittent sound from local areas will dominate the baseline sound climate.

### **Proposed Barsham WTW to CSR Pipeline**

- 14.4.21 The proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area runs through the residential areas of Spexhall and Ilketshall St Lawrence. Areas of Barsham Hill also fall within the study area alongside isolated dwellings adjacent to this section of the EIA Scoping Area.
- 14.4.22 The environmental sound climate at the centre of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area is likely to be dominated by road traffic on the A144, whilst the B1123 is expected to dominate area further south. In areas located farther from these roads; it is expected that road traffic from intermediary roads and intermittent sound from local areas will dominate the baseline sound climate. At the northern extent of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area, it is expected that sound associated with Barsham WTW will have an intermittent influence on the baseline sound climate.

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### **Proposed CSR to WSR Pipeline**

- 14.4.23 The proposed CSR to WSR Pipeline section of the EIA Scoping Area does not run through any residential areas, however, parts of Wilby, Horham, Ubbeston Green, Denham Street, South Green and Brome are located within the study area alongside various single isolated dwellings.
- 14.4.24 The environmental sound climate at the western extent of the proposed CSR to WSR Pipeline section of the EIA Scoping Area is likely to be dominated by road traffic on the A140. No other major roads (A or M classification) are situated within 2.5km of this section of the EIA Scoping Area. Therefore, it is expected that road traffic from intermediary roads and intermittent sound from local areas will dominate the baseline sound climate.

### **Proposed CSR to Saxmundham Pipeline**

- 14.4.25 The proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area runs through the predominantly residential areas of Saxmundham and includes the educational facility Realise Futures Learning and Development Centre. Areas of Sibton and Lonely Farm Country Park and various isolated single dwellings also fall within the study area.
- 14.4.26 The environmental sound climate at the southern extent of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and within its study area is likely to be dominated by road traffic on the A12 whilst the B1119 and A1120 are expected to dominate areas of the central and northern extent of this section of the EIA Scoping Area, respectively. For areas farther from these roads, it is expected that road traffic from intermediary roads and intermittent sound from local areas will dominate the baseline sound climate.

### **Proposed Saxmundham to SZC Pipeline**

- 14.4.27 The proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area runs through the residential areas of Dorley's Corner. Areas of Curlew

Green, Theberton and other single isolated dwellings are also located within the study area for this section.

- 14.4.28 The environmental sound climate at the western extent of this section of the EIA Scoping Area is likely to be dominated by road traffic on the A12, whilst sound associated with the construction phase of SZC and its associated works are expected to dominate the western extent of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area. For areas farther from the western extent, it is expected that road traffic from intermediary roads and intermittent sound from local areas will dominate the baseline sound climate.

### **Proposed Eastern Distribution Mains**

- 14.4.29 The proposed Eastern Distribution Mains section of the EIA Scoping Area contains residential areas of Mellis, Brome and Yaxley.
- 14.4.30 For the study area for this section of the EIA Scoping Area, it is expected that the baseline sound climate will be dominated by traffic movements on the A140. For areas farther from the A140, it is expected that road traffic from intermediary roads and intermittent sound from local areas will dominate the baseline sound climate.

### **Proposed Western Distribution Mains**

- 14.4.31 The proposed Western Distribution Mains section of the EIA Scoping Area contains residential areas of Finningham.
- 14.4.32 For the study area for this section of the EIA Scoping Area, it is expected that the baseline sound climate will be dominated by traffic movements on the B1113. For areas farther from the B1113, it is expected that road traffic from intermediary roads and intermittent sound from local areas will dominate the baseline sound climate.

## **14.5 Likely Significant Effects**

- 14.5.1 There is potential for noise and vibration during the Proposed Development's construction, operational and decommissioning phases to

have a significant effect on existing NVSRs. Sources that may generate noise or vibration levels greater than guidance thresholds are considered to be potentially significant and sources likely to generate noise or vibration levels under the thresholds are not considered to be potentially significant.

### Construction Phase

14.5.2 The potentially significant effects during the Proposed Development's construction phase are identified below:

- Noise from on-site construction plant on noise sensitive receptors.
- Vibration from on-site construction plant on vibration sensitive receptors.
- Noise from construction traffic on noise sensitive receptors.

### Operational Phase

14.5.3 There is potential for noise during the Proposed Development's operational phase to have a direct, permanent significant effect on existing noise sensitive receptors. Noise sources associated with the operational phase are likely to comprise the following components of the Proposed Development:

- Plant serving the proposed CSR and WSR.
- New pumping station (a subsidiary component) at the existing Lowestoft Water Recycling Centre ('WRC').
- Plant serving the proposed AWRP.

### Decommissioning Phase

14.5.4 Decommissioning phase impacts will be considered as direct, temporary effects.

14.5.5 At this scoping stage, anticipated decommissioning-related traffic flow data or level of construction plant to be used are yet to be finalised. Therefore, as a precautionary approach, an assessment of the effects from traffic and construction plant associated with the decommissioning phase are proposed to be scoped into the ES. However, this will be kept under review as more accurate decommissioning-related traffic and plant information becomes available.

14.5.6 The potentially significant impacts during the Proposed Development's decommissioning phase are identified below:

- Noise from on-site construction plant on noise sensitive receptors.
- Vibration from on-site construction plant on vibration sensitive receptors.
- Noise and vibration from construction traffic on noise sensitive receptors.

## 14.6 Impacts Scoped Out of the Assessment

### Operational Phase - Noise

14.6.1 During the operational phase, there are anticipated to be a limited number of worker visits to the proposed above ground infrastructure associated with day-to-day operation, maintenance, repair, refurbishment or replacement of equipment. The proposed AWRP component is anticipated to have up to 1 tanker delivery (one two-way vehicle movement) per week, and road traffic movements associated with up to 3 full-time equivalent ('FTE') workers on-site. Due to the low volume of expected vehicle movements, noise impacts associated with operational phase traffic are expected to be negligible and are therefore proposed to be scoped out of the assessment in the ES.

14.6.2 Operational phase noise and vibration effects from the Proposed Development's pipeline components are unlikely to be perceptible at sensitive receptor locations. As these will be predominantly buried underground (with some associated above ground fittings such as air valves and wash out valves), they are unlikely to generate vibration or sound amplification. Therefore, operational effects due to noise and vibration from the pipeline components are proposed to be scoped out of the assessment in the ES.

### Operational Phase - Vibration

14.6.3 The Proposed Development includes pumps associated with the AWRP, WSR and CSR components and new pumping station subsidiary component that could potentially generate vibration during the operational phase. However, these pumps will be designed to ensure that equipment operates within the design specifications through measures such as being

carefully balanced, installed on concrete bases (with anti-vibration mounts where appropriate), and connected to pipes using flexible connectors. Therefore, significant levels of vibration are not expected within areas where the plant is located and at greater distances, these levels will fall significantly below criteria pertaining to a low impact as per criteria outlined in the British Standards Institution's ('BSI') British Standard ('BS') 6472 (2008) [4]. Given the vibration reduction provided by these measures and the distance to sensitive receptors, ground-borne vibration is not anticipated to cause significant effects at locations sensitive to vibration. Furthermore, for the safe and efficient operation of such equipment, vibration must be kept to a minimum through design, commissioning and continuously during operation through condition monitoring and maintenance. Therefore, operational effects from the Proposed Development's pumps associated with the AWRP, WSR and CSR components and new pumping station at the Lowestoft WRC subsidiary component due to vibration are proposed to be scoped out of the assessment in the ES.

## 14.7 Proposed Approach to Mitigation

### Primary (inherent) Mitigation

- 14.7.1 Noise and vibration impacts during the Proposed Development's construction and operational phases have been a factor considered in its evolving design. This has been reflected in studies on the AWRP site options and factored into routing of the pipelines and location of the new WSR and CSR components, where appropriate. This is also a factor in ongoing studies for the proposed construction access and main construction compound location.
- 14.7.2 Following the noise and vibration assessment, mitigation measures needed to reduce or avoid significant adverse effects will be identified and included in the design of the Proposed Development, where practical.



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### Tertiary (Foreseeable) Mitigation

- 14.7.3 To minimise impacts from the Proposed Development on local residents, guidance contained within the BSI's BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise [5] (2009 original+2014 amendment) ('BS 5228-1:2009+A1:2014 Part 1: Noise') and the BSI's BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration 2 [6] (2009 original+2014 amendment) ('BS 5228-1:2009+A1:2014 Part 2: Vibration') will be used to define noise and vibration reduction measures and the 'best practicable means' ('BPM') approach will be implemented during its construction and decommissioning phases.
- 14.7.4 During the construction and decommissioning phases, the implementation of measures set out in a Construction Environmental Management Plan ('CEMP') and Decommissioning Environmental Management Plan ('DEMP'), in accordance with the Outline Construction Environmental Management Plan ('OCEMP') and the Outline Decommissioning Environmental Management Plan ('ODEMP'), respectively, to be submitted with the DCO application, would help to minimise potentially significant noise and vibration effects on sensitive receptors. Examples of measures are set out below:
- Plant and equipment shall be selected and maintained to minimise noise emissions where reasonably practicable.
  - Plant shall be positioned as far as practicable from sensitive receptors.
  - Equipment shall be shut down or throttled back when not in active use.

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## 14.8 Proposed Approach to the ES

### Assessment Methodology

#### Environmental Sound Survey

- 14.8.1 To quantify the baseline sound climate, environmental sound surveys will be undertaken at representative locations within the study areas.
- 14.8.2 Baseline environmental sound surveys are proposed only at representative locations of noise sensitive receptors likely to experience intermittent noise effects during the construction phase for at least one month or permanent, direct, noise effects during the operational phase of the Proposed Development.
- 14.8.3 It is anticipated that baseline environmental sound surveys will be undertaken for noise sensitive receptors in proximity to the proposed pumping station (subsidiary component), AWRP, WSR and CSR components of the Proposed Development, as well as temporary construction compounds. The scope of the survey will be discussed with the relevant LPAs' EHOs which have an administrative area within the study areas.
- 14.8.4 Class 1 sound level meters will be employed for all sound survey measurements. Sound level parameters, including  $L_{Aeq}$ ,  $L_{Amax}$ , and  $L_{A90}$ , will be recorded. The sound level meters will be calibrated before and after the survey. Sound surveys will be undertaken by surveyors who are suitably qualified and experienced.

#### Construction Noise

- 14.8.5 Construction noise and vibration impacts will be assessed using the methodology outlined in the BSI's BS 5228-1:2009+A1:2014 Part 1: Noise.
- 14.8.6 Details of the types of construction methods and plant likely to be used during the construction phase may be available, but it is unlikely to be possible to confirm precisely where the construction plant will operate and for how long during the working day. However, the noise and vibration

chapter of the ES will assess the maximum parameters and a ‘*cautious worst case*’ in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s Nationally Significant Infrastructure Projects (‘NSIPs’): Pre-Application Advice on Environmental Impact Assessment (July 2026) [7].

- 14.8.7 The BSI’s BS 5228-1:2009+A1:2014 Part 1: Noise does not provide specific limits for construction noise, but it does define methods of assessing the significance. The standard also provides information on construction noise and vibration reduction measures for a BPM approach to control noise and vibration. A method for determining the sound levels associated with construction activities is also detailed and considers the numbers and types of equipment operating, their associated Sound Power Level ( $L_w$ ), and the distance to sensitive receptors, along with the effects of any screening.
- 14.8.8 Based on the guidance detailed in Table E.1 of BS 5228-1:2009+A1:2014 Part 1: Noise, Table 14-1 defines the threshold of potential significant effects at residential dwellings. The threshold values to be used will be based on a combination of baseline sound survey data and sound level data in the England Round 4 datasets published in 2022 [8]. Defra noise mapping will be specifically used to determine baseline ambient sound levels for the assessment of construction noise from the pipeline components of the Proposed Development on sensitive receptors within the study area. Baseline sound surveys would be limited to representative locations where sensitive receptors are in close proximity to the pipeline component and agreed with the relevant LPAs’ EHO, as appropriate.

Table 14-1: Construction Noise Threshold Values

| Assessment Category and Threshold Value Period | Threshold value in dB ( $L_{Aeq,T}$ ) |                         |                         |
|------------------------------------------------|---------------------------------------|-------------------------|-------------------------|
|                                                | Category A <sup>A</sup>               | Category B <sup>B</sup> | Category C <sup>C</sup> |
| Night-time (23:00 - 07:00)                     | 45                                    | 50                      | 55                      |
| Evenings and Weekend <sup>D</sup>              | 55                                    | 60                      | 65                      |

| Assessment Category and Threshold Value Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Threshold value in dB ( $L_{Aeq,T}$ ) |                         |                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------|-------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Category A <sup>A</sup>               | Category B <sup>B</sup> | Category C <sup>C</sup> |
| Daytime (07:00 - 19:00) and Saturdays (07:00 - 13:00)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 65                                    | 70                      | 75                      |
| <p>Note 1 – A potential significant effect is indicated if the <math>L_{Aeq,T}</math> noise level arising from the construction site exceeds the threshold level for the category appropriate to the ambient noise level.</p> <p>Note 2 – If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise levels is higher than the above values), then a potential significant effect is indicated if the total <math>L_{Aeq,T}</math> noise level for the period increase by more than 3 dB due to construction site noise.</p> <p>Note 3 – Applied to residential receptors only.</p> <p><sup>A</sup> Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.</p> <p><sup>B</sup> Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.</p> <p><sup>C</sup> Category C: Threshold values to use when the ambient noise levels (when round to the nearest 5 dB) are higher that category A values.</p> <p><sup>D</sup> Category D: 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.</p> |                                       |                         |                         |

### Construction Vibration

- 14.8.9 The effects of human response to whole body vibration in buildings are defined in the BSI's BS 6472-1:2008 Guide to Evaluation of Human Exposure to Vibration from Buildings – Part 1: Vibration Sources Other Than Blasting [9] in terms of 'Vibration Dose Value' ('VDV'). However, for the human response to construction-related vibration, it is considered more appropriate to use the Peak Particle Velocity ('PPV'), as suggested in BS 5228-2:2009+A1:2014 Part 2: Vibration. The assessment will therefore consider impacts based on the PPV level.
- 14.8.10 The DMRB LA 111 Guidance states that a maintained road surface will be free of irregularities as part of general maintenance. Operational vibration impacts from road traffic are therefore not likely to lead to a significant effect on the majority of the road network. However, the assessment will consider the construction traffic routes and provide a proportional assessment within

the noise and vibration chapter of the ES based primarily on the road providing direct construction access.

- 14.8.11 Table B.2 of BS 5228-2:2009+A1:2014 Part 2: Vibration provides guidance on PPV vibration limits for transient excitation [10] for different building types. Table 14-2 outlines the transient vibration guide values for cosmetic damage to buildings. Limits to human receptors are provided in paragraph 14.8.19 and Table 14-5.

Table 14-2: Transient Vibration Guide Values for Cosmetic Damage

| Type of Building                                                                            | Peak Component Particle Velocity in Frequency Range of Predominant Pulse |                                                       |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------|
|                                                                                             | 4Hz to 15Hz                                                              | 15Hz and above                                        |
| Reinforced or framed Structures.<br>Industrial and heavy commercial buildings.              | 50mm/s at 4Hz and above                                                  |                                                       |
| Un-reinforced or light framed structures.<br>Residential or light commercial type buildings | 15mm/s at 4Hz increasing to 20mm/s at 15Hz                               | 20mm/s at 15Hz increasing to 50mm/s at 40Hz and above |

### Construction Traffic Noise

- 14.8.12 Construction traffic noise impacts along existing roads will be estimated based on the Calculation of Road Traffic Noise ('CRTN') [11] methodology for the calculation of the Basic Noise Level. Predictions will be undertaken for both the 'with' and 'without' construction road traffic generated by the Proposed Development scenarios for the 'peak' construction year, for each road link in the construction traffic model which could potentially impact a sensitive receptor.
- 14.8.13 As the assessment of construction traffic noise impacts are based on noise level calculations and road traffic flows, a baseline sound survey is not deemed necessary to inform this assessment.

## Operational Phase

- 14.8.14 Operational noise effects on residential noise sensitive receptors will be assessed using the guidance set out in the BSI's BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound (2019) [12] ('BS 4142:2014+A1:2019'), which is the accepted UK standard for rating and assessing the impact of sound of an industrial and/or commercial nature. The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a residential dwelling upon which sound is incident.
- 14.8.15 The method assesses the significance of sound which depends upon the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs/will occur. It is noted that a BS 4142:2014+A1:2019 assessment is reliant on measuring representative background sound levels.
- 14.8.16 Operational noise effects on non-residential receptors will be assessed in line with the Institute of Sustainability and Environmental Professionals' ('ISEP') (formerly the Institute of Environmental Management and Assessment) Guidelines for Environmental Noise Impact Assessments [13] (the 'ISEP Guidelines').

## Sensitivity of Receptors

- 14.8.17 The sensitivity of receptors likely to be affected by the different components of the Proposed Development is determined based on their usage and professional judgement. The sensitivity of different receptors for both noise and vibration during the construction, operational and decommissioning phases is detailed in Table 14-3.

Table 14-3: Sensitivity of Different Receptors

| Sensitivity | Description                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| High        | Residential, including private gardens where appropriate.<br>Schools and nurseries during the daytime.<br>Hospitals/residential care homes. |

| Sensitivity | Description                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------|
| Medium      | Public rights of way.<br>Places of worship.<br>Offices.<br>Retail units.                                   |
| Low         | Industrial, factories and working environments with existing high noise levels.<br>Bars/cafes/restaurants. |
| Very Low    | Night clubs and amplified music venues.<br>Agricultural buildings.                                         |

## Impact Magnitude

### Construction Noise

14.8.18 Table 14-4, based on guidance detailed in the DMRB LA111 Guidance, defines the construction noise adverse impact levels for residential buildings. For non-residential receptors, the level of significance will consider the magnitude of noise generated by construction activities and the building use.

Table 14-4: Construction Noise Impact Levels

| Magnitude of Impact                                                                                 | Construction Sound Level $L_{Aeq,T}$ (dB) at Residential Receptor            |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| High                                                                                                | Above or equal to the Threshold Level* + 5 dB                                |
| Medium                                                                                              | Above or equal to the Threshold Level* and below the Threshold Level* + 5 dB |
| <b>Significant Observed Adverse Effect Level SOAEL</b>                                              |                                                                              |
| Low                                                                                                 | Above or equal to the Ambient Sound Level and below the Threshold Level*     |
| <b>Lowest Observed Adverse Effect Level (LOAEL)</b>                                                 |                                                                              |
| Very Low                                                                                            | Below the Ambient Sound Level                                                |
| *Threshold level determined as per BS 5228:1:2009+A1:2014 Part 1: Noise, Section E3.2 and Table E.1 |                                                                              |

### Construction Vibration

14.8.19 Based on the guidance detailed in BS 5228-2:2009+ A1:2014 Part 2: Vibration, Table 14-5 details the assessment criteria.

Table 14-5: Construction Vibration Effect Levels

| Magnitude of Impact                                      | Vibration Level PPV mm/s | Description of Effects                                                                                                                                                           |
|----------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                                                     | > 10                     | Vibration is likely to be intolerable for any more than a very brief exposure.                                                                                                   |
| Medium                                                   | 1 to 10                  | Increasing likelihood of complaint in residential environments but can be tolerated at the lower end of the scale if prior warning and explanation have been given to residents. |
| <b>Significant Observed Adverse Effect Level (SOAEL)</b> |                          |                                                                                                                                                                                  |
| Low                                                      | 0.3 to 1                 | Increasing likelihood of perceptible vibration in residential environments.                                                                                                      |
| <b>Lowest Observed Adverse Effect Level (LOAEL)</b>      |                          |                                                                                                                                                                                  |
| Very Low                                                 | < 0.3                    | Vibration is unlikely to be perceptible in even the most sensitive situations for most vibration frequencies associated with construction.                                       |

14.8.20 In addition to the above, construction noise and vibration would constitute a significant effect where it is determined that a high or medium magnitude of impact will occur for a duration exceeding:

- 10 or more days or nights in any 15 consecutive days or nights, or
- A total number of days exceeding 40 in any 6 consecutive months.

### Construction Traffic Noise

14.8.21 The assessment within the noise and vibration chapter of the ES will use construction traffic criteria as detailed in the DMRB LA 111 Guidance to assess the temporary construction traffic impacts. Table 14-6 details the assessment criteria.

Table 14-6: Magnitude of Construction Road Noise Level Change

| Magnitude of Impact | Change in Noise Level $L_{A10,18hr}$ (dB) of Road used for Construction Traffic and Operational Traffic |
|---------------------|---------------------------------------------------------------------------------------------------------|
| High                | $\geq 5.0$                                                                                              |
| Medium              | 3.0 to 4.9                                                                                              |
| Low                 | 1.0 to 2.9                                                                                              |



| Magnitude of Impact | Change in Noise Level $L_{A10,18hr}$ (dB) of Road used for Construction Traffic and Operational Traffic |
|---------------------|---------------------------------------------------------------------------------------------------------|
| Very Low            | <1                                                                                                      |

14.8.22 Based on guidance within the DMRB LA 111 Guidance, construction traffic noise would constitute a significant effect where it is determined that a high or medium magnitude of impact will occur for a duration exceeding:

- 10 or more days or nights in any 15 consecutive day or nights, or
- A total number of days exceeding 40 in any 6 consecutive months.

### Operational Phase

14.8.23 Operational noise effects on residential noise sensitive receptors will be assessed using the guidance set out in BS 4142:2014+A1:2019.

14.8.24 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level and considering the following:

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

14.8.25 A level of significance can then be determined once the context has been taken into account which will vary for the different receptors assessed. To consider the context, BS 4142:2014+A1:2019 advises that the following factors should be considered:

- The absolute level of sound. Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the

margin by which the rating level exceeds the background. This is especially true at night.

- The character and level of the residual sound compared to the character and level of the specific sound.
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions such as:
  - Façade insulation treatment.
  - Ventilation and/or cooling that will reduce the need to have windows open to provide rapid or purge ventilation.
  - Acoustic screening.

14.8.26 Operational noise effects on non-residential receptors will be assessed in line with the ISEP Guidelines and absolute levels. Based on this guidance document and the examples provided within its supporting appendices, Table 14-7 details the relative change in sound level and the corresponding magnitude of impact.

Table 14-7: Magnitude of Impact at Non- Residential Receptors

| Magnitude of Impact | Relative Change in Sound Level (dB) |
|---------------------|-------------------------------------|
| High                | ≥ 10.0                              |
| Medium              | 5.0 to 9.9                          |
| Low                 | 3.0 to 4.9                          |
| Very Low            | <2.9                                |

## Effect Significance

14.8.27 The impact assessment of noise and vibration effects is based on the magnitude of the impact and taking account of the sensitivity of the receptor. The assessment of magnitude of impact is based on comparison with the relevant noise and vibration criteria depending on the specific impact type being considered.

14.8.28 Based on the ISEP Guidelines and Planning Practice Guidance ('PPG') [14], the relationship between the noise and vibration impact, effect, and significance is described in Table 14-8.

Table 14-8: Relationship between Noise and Vibration Impact, Effect and Significance

| Magnitude (Nature of Impact) | Description of Effect (on a specific receptor)                                                                                                                                                                                                                                                                                                                  | Significance                  |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Major Adverse                | Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area.                                  | More likely to be significant |
| Moderate Adverse             | Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance. Affects the character of the area such that there is a perceived change in the quality of life. Increasing likelihood of complaint from vibration. | Less likely to be significant |
| Minor Adverse                | Noise impact can be heard but does not cause any change in behaviour or attitude, e.g. turning up the volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life. Increasing likelihood of perceptible vibration.                          |                               |
| Negligible                   | N/A = No discernible effect on the receptor                                                                                                                                                                                                                                                                                                                     | Not significant               |

14.8.29 The approach to assessing and assigning significance to an environmental effect relies upon the context of the results of the assessment undertaken in terms of magnitude of impact.

14.8.30 Effects that are described as ‘minor’ or ‘negligible’ are determined to be ‘not significant’, and effects that are described as ‘moderate’ or ‘major’ are

determined to be 'significant' in the context of the assessment of likely significant effects.

- 14.8.31 The level of effects and significance will be determined based on the magnitude of impact and receptor sensitivity. In line with policy, as detailed in the Noise Policy Statement for England [15] and Planning Practice Guidance, consideration will also be given to the proposed Lowest Observed Adverse Effect Level ('LOAEL') and Significant Observed Adverse Effect Level ('SOAEL') for each receptor based on appropriate guidance and standards.
- 14.8.32 It should be noted that the magnitude of impact might not directly translate into the same significance of effects. The significance of effects will depend on the context of each situation being assessed, in addition to the magnitude of impact and sensitivity of receptor. Professional judgement, alongside best practice guidance, will also be applied to the assessment of the significance of effects.
- 14.8.33 The National Policy Statement for Water Resources Infrastructure (2023) [16] states that *'The Secretary of State should not grant development consent unless satisfied that the proposals will meet the following aims, through the effective management and control of noise, within the context of government policy on sustainable development:*
- *Avoid significant adverse impacts on health and quality of life from noise as a result of the new development*
  - *Minimise and mitigate other adverse impacts on health and quality of life from noise from the new development*
  - *Where possible, contribute to improvements to health and quality of life.'*

### Mitigation and Residual Effects

- 14.8.34 The noise and vibration chapter of the ES will assess effects both with and without the implementation of mitigation measures:
- Pre-mitigation effects (or 'unmitigated effects'): effects that would occur in the absence of any mitigation.

- Residual effects: effects that remain after the implementation of mitigation measures (primary, secondary, and tertiary), representing the ‘cautious ‘worst case’ outcome in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026).

14.8.35 As set out in Section 14.7 above, the assessment will distinguish between:

- Primary (inherent) mitigation: design features integrated into the Proposed Development.
- Secondary (foreseeable) mitigation: measures designed to reduce likely significant effects.
- Tertiary (inexorable) mitigation: measures required by legislation, policy, or standard best practice.

14.8.36 Where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES.

### In-combination Effects

14.8.37 The assessment will consider potential in-combination effects where noise and vibration impacts interact with other environmental factors to create a greater overall effect on a single receptor. For example, increased traffic flows may lead to elevated noise and air quality impacts at sensitive receptors such as residential properties, schools, and healthcare facilities. These combined effects could be more significant than each impact assessed in isolation. The in-combination effects will be assessed within the ES.

14.8.38 As set out in chapter 23 cumulative effects assessment of this Scoping Report, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within the ES.

### Limitations and Assumptions

14.8.39 The following limitations and assumptions are anticipated to be applicable to the noise and vibration assessment.

- 
- 14.8.40 The assessment of construction impacts will be based on information supplied by the project design team and main contractors. Such information will include the types of plant and equipment which are likely to be used for the construction works, along with the construction schedule, works locations and traffic demand. Depending on the level of detail available, it may be necessary to adopt ‘*cautious ‘worst case’’* assumptions in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026) on aspects such as plant locations and works durations to ensure a robust assessment. In the absence of information from the contractor, the project design team will be used to inform the assessment.
- 14.8.41 Any measurement of existing ambient or background sound levels will be subject to a degree of uncertainty. Environmental sound levels can vary throughout the year due to variations in source levels and meteorological effects on sound propagation. However, effort will be made to ensure that measurements are appropriately representative and avoid periods of adverse weather conditions, and school holiday periods (which are often considered to result in atypical sound levels).
- 14.8.42 Operational noise assessments will be based on information available at the time of the assessment. Plant details are unlikely to be fixed and therefore ‘*cautious ‘worst case’’* assumptions on plant likely to be installed may need to be adopted.
- 14.8.43 Noise generated by emergency generators has the potential to affect nearby receptors. The specific assessment criteria to be assessed in the noise and vibration chapter of the ES will be determined once the operational details, such as how frequently and for how long the generators will run, are available. It is expected that the emergency generators will operate during both emergency conditions and part of a testing procedure.
-

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- 14.8.44 Any changes to the existing hydrological regime on watercourses during the operational phase of the Proposed Development are not expected to result in likely significant effects on NVSRs.

## **14.9 Summary of Impacts and Effects**

- 14.9.1 Table 14-9 provides a summary of the noise and vibration receptors, potential significant effects, anticipated magnitude, sensitivity and whether the receptor/effect is proposed to be scoped into or out of the assessment for the construction, operational and decommissioning phases of the Proposed Development.

Table 14-9: Summary of Noise and Vibration Scope

| Receptor                                                    | Effects                                                                                             | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                              | Scoped in/ Scoped out |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Construction Phase</b>                                   |                                                                                                     |                       |                                     |                                                |                                                                                                                                         |                       |
| NVSRs to include residential dwellings, hospitals, schools. | Direct Temporary Effect.<br>Receptor may be subject to noise impact from construction plant.        | High to Low           | High to Medium                      | Significant                                    | Best practice measures based on BS 5228:2009+A1:2014 and incorporated within the CEMP for implementation, in accordance with the OCEMP. | Scoped in             |
| NVSRs to include residential dwellings, hospitals, schools. | Direct Temporary Effect.<br>Receptor may be subject to noise impacts from construction traffic.     | High to Low           | High to Medium                      | Significant                                    | Avoid routing through residential areas where possible.                                                                                 | Scoped in             |
| NVSRs to include residential dwellings, hospitals, schools. | Direct Temporary Effect.<br>Receptor may be subject to vibration impacts from construction traffic. | Low                   | High to Medium                      | Significant                                    | Maintained road surface as part of general maintenance.                                                                                 | Scoped in             |
| NVSRs to include residential                                | Direct Temporary Effect.                                                                            | High to Low           | High to Medium                      | Significant                                    | Best practice measures based on BS 5228:2009+A1:2014                                                                                    | Scoped in             |



| Receptor                                                   | Effects                                                                                               | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                        | Scoped in/ Scoped out |
|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| dwelling, hospitals, schools.                              | Receptor may be subject to vibration impact from construction plant.                                  |                       |                                     |                                                | and incorporated within the CEMP for implementation, in accordance with the OCEMP.                                                                                                                                                |                       |
| NVSRs to include residential dwelling, hospitals, schools. | Direct Temporary Effect<br>Receptor may be subject to noise impact from construction of pipeline.     | High to Low           | High to Medium                      | Significant                                    | Best practice measures based on BS 5228:2009+A1:2014 and incorporated within the CEMP for implementation, in accordance with the OCEMP.                                                                                           | Scoped in             |
| <b>Operational Phase</b>                                   |                                                                                                       |                       |                                     |                                                |                                                                                                                                                                                                                                   |                       |
| NVSRs to include residential dwelling, hospitals, schools. | Direct Permanent Effect.<br>Receptor may be subject to building services/operational and plant noise. | High to Low           | High to Medium                      | Significant                                    | Enclosing noise generating plant within the building envelope.<br>Selecting 'low noise' plant items.<br>Positioning air intake/discharge louvres away from noise sensitive receptors.<br>Orientating air intake/discharge louvres | Scoped in             |

| Receptor                                                    | Effects                                                                                                        | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                      | Scoped in/ Scoped out |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                             |                                                                                                                |                       |                                     |                                                | away from noise sensitive receptors.<br>Attenuation of air intake/discharge louvres with duct mounted attenuators.<br>Sound insulating plant housing/enclosures.                |                       |
| NVSRs to include residential dwellings, hospitals, schools. | Direct Permanent Effect.<br>Receptor may be subject to vibration impacts from operation of the proposed pumps. | Low                   | High to Medium                      | Not Significant                                | Embedded mitigation by being balanced and located on large concrete bases (including anti-vibration mounts where appropriate) and isolated from pipes using flexible connector. | Scoped out            |
| NVSRs to include residential dwellings, hospitals, schools. | Direct Permanent Effect.<br>Receptor may be subject to noise from operational traffic.                         | Low                   | High to Medium                      | Not Significant                                | None anticipated.                                                                                                                                                               | Scoped out            |
| NVSRs to include residential                                | Direct Permanent Effect.                                                                                       | Low                   | High to Medium                      | Not Significant                                | None anticipated.                                                                                                                                                               | Scoped out            |

| Receptor                                                    | Effects                                                                                             | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                              | Scoped in/ Scoped out |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| dwelling, hospitals, schools.                               | Receptor may be subject to noise from the operation of the pipeline.                                |                       |                                     |                                                |                                                                                                                                         |                       |
| <b>Decommissioning Phase</b>                                |                                                                                                     |                       |                                     |                                                |                                                                                                                                         |                       |
| NVSRs to include residential dwellings, hospitals, schools. | Direct Temporary Effect.<br>Receptor may be subject to noise impact from construction plant.        | High to Low           | High to Medium                      | Significant                                    | Best practice measures based on BS 5228:2009+A1:2014 and incorporated within the CEMP for implementation, in accordance with the OCEMP. | Scoped in             |
| NVSRs to include residential dwellings, hospitals, schools. | Direct Temporary Effect.<br>Receptor may be subject to noise impacts from construction traffic.     | High to Low           | High to Medium                      | Significant                                    | Avoid routing through residential areas where possible.                                                                                 | Scoped in             |
| NVSRs to include residential dwellings, hospitals, schools. | Direct Temporary Effect.<br>Receptor may be subject to vibration impacts from construction traffic. | Low                   | High to Medium                      | Significant                                    | Maintained road surface as part of general maintenance.                                                                                 | Scoped in             |

| Receptor                                                    | Effects                                                                                          | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                              | Scoped in/ Scoped out |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| NVSRs to include residential dwellings, hospitals, schools. | Direct Temporary Effect.<br>Receptor may be subject to vibration impact from construction plant. | High to Low           | High to Medium                      | Significant                                    | Best practice measures based on BS 5228:2009+A1:2014 and incorporated within the CEMP for implementation, in accordance with the OCEMP. | Scoped in             |

## 15 Air Quality and Odour

### 15.1 Introduction

15.1.1 This chapter describes the proposed scope and methodology for the assessment of the likely significant effects of the Suffolk Water Recycling, Transfer and Storage Project (the 'Proposed Development') on air quality and odour. The assessment of significant effects will be presented within the Environmental Statement ('ES') submitted in support of the application for a Development Consent Order ('DCO'). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the likely significant effects to be considered within the assessment, and how the likely significant effects will be assessed.

15.1.2 The EIA Scoping Area is illustrated on Figure 1-1. This chapter should be read in conjunction with the following chapters of the Scoping Report:

- Chapter 2 The Proposed Development.
- Chapter 3 EIA Methodology.
- Chapter 6 Terrestrial Biodiversity.
- Chapter 9 Water Environment.
- Chapter 13 Traffic and Access.
- Chapter 16 Climate Change.
- Chapter 17 Socio-economics.
- Chapter 18 Human Health.
- Chapter 20 Agricultural Land and Soils.
- Chapter 21 Materials and Waste.

15.1.3 The term 'air quality' refers to air pollution that could potentially affect health, such as emissions of air pollutants from vehicle exhausts and other combustion sources. The term 'air quality' also refers to dust, which could affect health or give rise to annoyance due to the soiling of surfaces through deposition. Both air pollution and dust could also affect sensitive plants and ecosystems. Additionally, odour, which could give rise to annoyance, is also considered within the term 'air quality'.

- 15.1.4 The author of this chapter has over 11 years of experience as an air quality consultant and is a member of the Institution of Environmental Services ('IES') and Institute of Air Quality Management ('IAQM'). The author has advised on other projects of a similar size, nature and scale to the Proposed Development including as part of a DCO application.

### Potential Emission Sources of Air Pollutants

- 15.1.5 This chapter considers the potential emission sources of air pollutants, dust and odour associated with the Proposed Development as set out below.

#### Construction Phase

- Dust emissions generated by earthworks and construction activities including site preparation, excavation and material handling/storage (it should be noted that no demolition activities are planned during the construction phase).
- Emissions of pollutants to air from construction vehicles on the local road network.
- Emissions of pollutants to air from construction plant and machinery.
- Odour emissions during earthworks.

#### Operational Phase

- Emissions of pollutants to air from operational vehicles on the local road network.
- Emissions of pollutants to air from operational plant and machinery including the Proposed Development's Advanced Water Recycling Plant ('AWRP').
- Odour emissions generated from the operation of the proposed AWRP.

#### Decommissioning Phase

- Dust emissions generated by the removal of the above-ground infrastructure components of the Proposed Development.
- Emissions of pollutants to air from associated vehicles on the local road network.
- Emissions of pollutants to air from associated plant and machinery.
- Odour emissions during earthworks.

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## 15.2 Study Area

- 15.2.1 The study areas will be refined throughout the evolution of the Proposed Development. However, it is anticipated that the study areas for the ES will be the proposed EIA Scoping Area plus the study areas as described below.
- 15.2.2 Appendix 15.1 to this chapter sets out the relevant legislation, policy and guidance relevant to air quality and odour. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

### Dust Effects

- 15.2.3 For dust emissions, the study area for the assessment of human receptors will focus on areas up to 250m from where the dust generating activities occur. This distance is based on the IAQM's Guidance on the assessment of dust from demolition and construction (Version 2.2) (2024) [1] (the 'IAQM Construction Dust Guidance') for identifying when an assessment of dust effects is required.
- 15.2.4 The effects of trackout (i.e. the transport of dust and dirt from a construction site onto the public road network, where it may be deposited and re-suspended by vehicle movements) has the potential to occur up to 50m from the edge of local construction routes up to 250m from the construction site exit(s).
- 15.2.5 In line with IAQM Construction Dust Guidance, the study area for the assessment of potential ecological receptors will focus on areas within 50m from where the dust generating activities occur, and within 50m from the edge of local construction routes within 250m of the construction site exit(s) in relation to trackout effects.

### Vehicle Exhaust Emissions

- 15.2.6 For the assessment of emissions from road traffic, the study area is based on identifying where construction, operation or decommissioning activities

would lead to a change in traffic flows on the road network, that exceed the relevant thresholds set out in the Environmental Protection UK ('EPUK') and IAQM's Land-Use Planning & Development Control: Planning for Air Quality (2017) [2] guidance (the 'EPUK and IAQM Planning Guidance'), as set out below.

- The change in light duty vehicle ('LDV') [3] flows of more than 100 annual average daily traffic ('AADT') [4] within or adjacent to an Air Quality Management Area ('AQMA') [5] or more than 500 AADT elsewhere.
- The change in heavy duty vehicle ('HDV') [6] flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.

15.2.7 Road links where the change in traffic flows exceed these thresholds are considered to be 'affected' roads. The study area for the assessment of potential air quality effects from road traffic generated by the Proposed Development would include receptors within 200m of these 'affected' roads.

### Non-Road Mobile Machinery ('NRMM') Emissions

15.2.8 A quantitative assessment of emissions from site plant and machinery (i.e. NRMM), during construction or decommissioning, would consider the potential effects at the nearest receptors, within 200m of where the emissions are occurring (based on the same area as vehicle exhaust emissions above). Based on an understanding of the scale and nature of construction and decommissioning activities associated with the Proposed Development, NRMM emissions are unlikely to have significant effects on sensitive receptors beyond a distance of 200m due to their intermittent operation and magnitude of pollutant emissions, based on the same distance as vehicle exhaust emissions above.

### Combustion Plant Emissions During Operation

15.2.9 A quantitative assessment of emissions from combustion plant during the Proposed Development's operational phase would consider the most relevant sensitive human receptors to the proposed emission sources where the maximum impact could occur. The exact distance would depend



on the height of the emission release (i.e. the higher the release the further away the maximum impact may occur).

15.2.10 For designated ecological sites (also referred to as ‘protected conservation areas’), as per the Environment Agency’s Air Emissions Risk Assessment for your Environmental Permit (2025) [7] guidance (the ‘EA Environmental Permit Guidance’), it is necessary to identify protected conservation areas within the following distances from the emission sources:

- International sites (i.e. Special Protection Areas (‘SPAs’), Special Areas of Conservation (‘SACs’) and Ramsar sites) within a 10km radius of the emission source.
- Sites of Special Scientific Interest (‘SSSIs’) and local nature sites (i.e. ancient woodlands, county wildlife sites (‘CWSs’), local wildlife sites (‘LWSs’), national nature reserves (‘NNRs’) and local nature reserves (‘LNRs’)), within a 2km radius of the emission source.

### Odour Emissions

15.2.11 The study area for the assessment of emissions of odour is limited to the closest adjacent land users within a 2km radius from the odour source. The nature and scale of construction, operational and decommissioning activities associated with the Proposed Development means that, based on professional judgement, the potential odour impact at sensitive human receptors beyond 2km are likely to be negligible. The odour assessment would adhere to the IAQM’s Guidance on the Assessment of Odour for Planning (Version 1.1) (2018) [8] (the ‘IAQM Odour Planning Guidance’), which is the best practice guidance for the assessment of likely significant odour effects.

15.2.12 Further description of the proposed approach is provided in Section 15.8.

## 15.3 Consultation and Engagement

15.3.1 A virtual meeting was held with representatives from Suffolk County Council (‘SCC’), Norfolk County Council (‘NCC’), East Suffolk Council (‘ESC’), Mid Suffolk District Council (‘MSDC’), South Norfolk District Council (‘SNDC’), Great Yarmouth Borough Council (‘GYBC’) and the Broads Authority (‘BA’) on 3 February 2026 to discuss the proposed approach to the assessment of

the Proposed Development's likely significant effects on air quality and odour. Discussion was held around the potential impacts of pipeline routes that might pass through historic landfill sites. It was stated that potential construction odour emissions will be scoped in. It was also agreed that 'worst case' locations will be assessed within the ES.

## **15.4 Baseline Environment**

### **Baseline Data Collection**

15.4.1 A review of baseline air quality data has been carried out to inform the proposed scope of the assessment of likely significant effects on air quality. The following baseline sources have been reviewed:

- UK Air Information Resource ('UK-AIR') [9], [10], [11], [12], [13].
- West Suffolk Council monitoring survey data [14].
- GYBC monitoring survey data [15].
- Broadland District Council and SNDC monitoring survey data [16].
- MSDC monitoring survey data [17].
- ESC monitoring survey data [18].
- Air Pollution Information System ('APIS') website [19].

15.4.2 The baseline data presented in this section will be included in the ES or updated accordingly should more recent data become available at the time of writing. Baseline data considered in the ES may also include modelled baseline conditions, where relevant.

### **Local Air Quality Management ('LAQM')**

15.4.3 All local authorities are expected to regularly undertake air quality monitoring, assessment and reporting in their administrative area in line with their LAQM duties, which are reported in their Annual Status Reports ('ASRs'). If there are found to be any exceedances of any of the air quality objectives ('AQOs') within the local authority's area, then an AQMA must be declared and actions taken to reduce the concentration. No AQMAs have been identified within the EIA Scoping Area. The nearest AQMA to the EIA Scoping Area is 'Central Norwich AQMA', which was declared by Norwich

City Council for elevated concentrations of annual mean nitrogen dioxide ('NO<sub>2</sub>'), due to road traffic. The 'Central Norwich AQMA' is approximately 20km northwest of the EIA Scoping Area at its closest point. The next nearest AQMA is called 'Ipswich AQMA No 2', which was declared by Ipswich Borough Council for elevated concentrations of annual mean NO<sub>2</sub>, due to road traffic. The Ipswich AQMA No 2 is approximately 27km southwest of the EIA Scoping Area at its closest point. Given the distances of these two AQMAs from the EIA Scoping Area, it is highly unlikely they will be impacted by the Proposed Development.

### Air Quality Monitoring

- 15.4.4 Local air quality monitoring data from the most recent publicly available local authority ASRs has been collated to establish baseline conditions.
- 15.4.5 It should be noted that many of the NO<sub>2</sub> diffusion tube sites considered are situated in 'worst case' locations (such as at the roadside), where the highest pollutant concentrations are likely to occur. Pollutant concentrations at these locations do not necessarily represent those at the nearest location of relevant exposure (including residential properties), where AQOs or Limit Values apply. Further description of AQOs and Limit Values is provided in Appendix 15.1.
- 15.4.6 All reported monitoring data is either over 75% data capture or has been processed by the relevant local authority so as to be representative of annual mean concentrations (a process known as 'annualisation'). Where it is not stated in the source, it has been assumed that this is the case.
- 15.4.7 During the five-year period 2020-2024, there were no exceedances of the NO<sub>2</sub> AQO / Limit Value of 40µg/m<sup>3</sup>. It should be noted that monitoring data for 2020 and 2021 are arguably not considered representative of 'typical' air quality conditions due to the impact of COVID-19 travel restrictions on traffic flows, which typically resulted in much lower annual mean NO<sub>2</sub> concentrations at roadside sites than in previous years.

15.4.8 Table 15-1 presents NO<sub>2</sub> pollutant concentrations at diffusion tube monitoring locations within 2km of the EIA Scoping Area, which are all managed by ESC. These monitoring locations are also shown on Figure 15-1.

Table 15-1: Monitored Annual Mean NO<sub>2</sub> (µg/m<sup>3</sup>) Concentrations within 2km of the EIA Scoping Area (2020 – 2024)

| Site ID                                                   | Site Type        | Approximate Distance from EIA Scoping Area (km) | 2020 | 2021 | 2022 | 2023 | 2024 |
|-----------------------------------------------------------|------------------|-------------------------------------------------|------|------|------|------|------|
| LOW 1                                                     | Roadside         | 1.4                                             | 22.4 | 23.8 | 24.6 | 21.5 | 20.0 |
| LOW 3                                                     | Roadside         | 1.65                                            | 16.0 | 19.3 | 18.6 | 15.1 | 15.7 |
| LOW 5                                                     | Urban background | 1.28                                            | 10.7 | 11.0 | 11.1 | 9.3  | 9.4  |
| LOW 6a,b,c                                                | Roadside         | 1.34                                            | 29.3 | 33.2 | 32.6 | 28.0 | 25.4 |
| LOW 7                                                     | Roadside         | 1.37                                            | 24.8 | 27.8 | 29.2 | 25.3 | 22.4 |
| LOW 8                                                     | Roadside         | 1.4                                             | 17.6 | 18.8 | 19.9 | 17.3 | 16.7 |
| LOW 9                                                     | Roadside         | 1.1                                             | 24.6 | 24.1 | 26.5 | 23.6 | 22.1 |
| LOW 12                                                    | Suburban         | 1.18                                            | 12.2 | 13.4 | 14.9 | 12.4 | 11.2 |
| LOW 13                                                    | Kerbside         | 1.63                                            | 16.7 | 17.9 | 19.9 | 14.0 | 16.0 |
| LOW 16                                                    | Roadside         | 0.74                                            | -    | -    | -    | 20.0 | 19.5 |
| LOW 25                                                    | Roadside         | 1.38                                            | -    | -    | -    | -    | 12.6 |
| BEC 1                                                     | Roadside         | 1.81                                            | 18.0 | 19.1 | 19.1 | 17.1 | 17.3 |
| BEC 3                                                     | Roadside         | 1.76                                            | 25.3 | 25.7 | 27.7 | 26.5 | 24.3 |
| BEC 4                                                     | Roadside         | 1.77                                            | 16.9 | 18.7 | 19.2 | 16.5 | 14.8 |
| BEC 5a,b,c                                                | Kerbside         | 1.79                                            | 22.7 | 26.1 | 25.5 | 23.2 | 20.4 |
| BEC 9                                                     | Roadside         | 1.86                                            | -    | -    | -    | -    | 14.2 |
| HLW 3                                                     | Other            | 0.75                                            | -    | -    | -    | -    | 12.2 |
| ILK 1                                                     | Other            | 0.46                                            | -    | -    | -    | -    | 8.5  |
| THEB 1                                                    | Kerbside         | 0.33                                            | 14.8 | 16.1 | 15.2 | 14.4 | 12.3 |
| SAX 1                                                     | Roadside         | 0.69                                            | 20.7 | 25.1 | 22.5 | 21.8 | 19.9 |
| LEI 2                                                     | Roadside         | 1.95                                            | 18.6 | 20.1 | 19.3 | 17.9 | 18.1 |
| LEI 3                                                     | Roadside         | 1.83                                            | 17.8 | 19.3 | 18.4 | 18.1 | 15.5 |
| LEI 4                                                     | Roadside         | 1.84                                            | -    | -    | 10.0 | 9.6  | 10.7 |
| “-“ information on monitored concentration not available. |                  |                                                 |      |      |      |      |      |

- 15.4.9 Table 15-1 indicates that there has been a slight general downward trend in annual mean NO<sub>2</sub> concentrations, albeit with a slight increase in 2021 (compared to 2020) owing to post COVID-19 travel restriction relaxations. All diffusion tube concentrations are well below the annual mean NO<sub>2</sub> AQO/ Limit Value (i.e. 40µg/m<sup>3</sup>) and therefore exceedances are unlikely to occur.
- 15.4.10 The highest annual mean NO<sub>2</sub> concentration presented in Table 15-1 is 33.2µg/m<sup>3</sup>, which was recorded in 2021 at co-located diffusion tubes Low 6a,b,c. This monitoring site is approximately 1.34km south of the EIA Scoping Area and is located on the A12 (Belvedere Road) in Lowestoft. The elevated concentration (compared to the other diffusion tubes sites) measured at this location is most likely caused by its positioning in the vicinity of traffic lights at the B1532 (London Road South) junction where queuing of traffic may occur.
- 15.4.11 The closest monitoring site to the EIA Scoping Area is diffusion tube THEB1, which is located on the B1122 (Leiston Road) in the village of Theberton. Monitored NO<sub>2</sub> concentrations at this diffusion tube location are well within the NO<sub>2</sub> AQO / Limit Value of 40µg/m<sup>3</sup>.
- 15.4.12 The ESC-managed monitoring is considered representative (i.e. relevant exposure) and indicative of local air quality surrounding the Proposed Development.

### Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)

- 15.4.13 There is a continuous Automatic Urban and Rural ('AURN') monitoring station (Site ID 'SIB') within the EIA Scoping Area, which is located less than 30m from Halesworth Road in Sibton, approximately 150m to 1km west of the proposed Central Service Reservoir ('CSR') section of the EIA Scoping Area. The monitoring station records PM<sub>10</sub> (i.e. particles with an aerodynamic diameter of 10 microns or less) and PM<sub>2.5</sub> (i.e. particles with an aerodynamic diameter of 2.5 microns or less). In 2024 (the only data available), the monitoring station recorded an annual mean PM<sub>10</sub> and PM<sub>2.5</sub> concentration of 10µg/m<sup>3</sup> and 7µg/m<sup>3</sup>, respectively. The AQO / Limit Value

for PM<sub>10</sub> and PM<sub>2.5</sub> are 40µg/m<sup>3</sup> and 20µg/m<sup>3</sup>, respectively, and the PM<sub>2.5</sub> Target is 10µg/m<sup>3</sup>.

### Mapped Background Concentrations

- 15.4.14 Information on background air quality in the vicinity of the EIA Scoping Area were obtained from the Department for Environment, Food and Rural Affairs ('Defra') background map datasets. The 2021-based background maps by Defra are estimates based upon the principal local and regional sources of emissions and ambient monitoring data. Defra provide background maps for a range of pollutants for the UK in 1km-by-1km grid squares for each year between 2021 and 2040.
- 15.4.15 Background map concentrations within 2km of the EIA Scoping Area for NO<sub>2</sub>, oxides of nitrogen (NO<sub>x</sub>), PM<sub>10</sub> and PM<sub>2.5</sub> are presented in Table 15-2 for 2026 (i.e. the current year), 2029 (i.e. the Proposed Development's first year of construction) and 2032 (i.e. the Proposed Development's opening year).
- 15.4.16 Table 15-2 indicates that mapped background pollutant concentrations for NO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are all below the respective annual mean AQO/Limit Value in the current, earliest construction and opening years. Furthermore, the PM<sub>2.5</sub> annual mean concentrations are below the interim target of 10µg/m<sup>3</sup> (refer to Table 15-5 for further description).

Table 15-2: Mapped Background Pollutant Concentration (µg/m<sup>3</sup>) Ranges for Current Year (2026) and Opening Year for Construction (2029) and Operation (2032) within 2km of the EIA Scoping Area

| Pollutant                                                                                                      | Annual Mean AQO/Limit Value (Target) | 2026       | 2029       | 2032       |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------|------------|------------|------------|
| NO <sub>2</sub>                                                                                                | 40                                   | 4.8 – 15.6 | 4.4 – 14.3 | 4.0 – 13.5 |
| NO <sub>x</sub>                                                                                                | 30*                                  | 6.0 – 21.6 | 5.4 – 19.5 | 5.0 – 18.3 |
| PM <sub>10</sub>                                                                                               | 40                                   | 9.1 – 15.3 | 8.9 – 15.1 | 8.7 – 14.9 |
| PM <sub>2.5</sub>                                                                                              | 20 (10)                              | 5.2 – 9.8  | 5.0 – 9.6  | 4.8 – 9.4  |
| * Objective set for the protection of vegetation and ecosystems. This standard does not apply to human health. |                                      |            |            |            |

## Pollution Climate Mapping Model

- 15.4.17 The Pollution Climate Mapping ('PCM') model is run by Ricardo Energy & Environment on behalf of Defra and is designed to fulfil The Air Quality Standards Regulations 2010 (as amended in 2016) [20] and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 [21], in the context of Limit Values (refer to Appendix 15.1 for further details). The PCM model reports on the concentrations of particular pollutants in the atmosphere for comparison to the legally binding Limit Values. Modelled NO<sub>2</sub> PCM concentrations are projected from a base year and for every year up to 2030, at representative roadside receptors throughout the UK. PM<sub>10</sub> and PM<sub>2.5</sub> PCM projections are projected from a base year to specific years 2020, 2025 and 2030.
- 15.4.18 A review of the most recent PCM NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> model data identified 16 modelled links within 2km of the EIA Scoping Area in Lowestoft and Beccles including parts of the A12, A1117, A1144 and A145. There are no predicted exceedances of the annual mean NO<sub>2</sub>, PM<sub>10</sub> or PM<sub>2.5</sub> Limit Values up to and including 2030 (refer to Table 15-3). Additional PCM links may be considered during the actual assessment once the full study area is known.

Table 15-3: Mapped PCM Pollutant Concentration (µg/m<sup>3</sup>) Ranges for Current Year (2026) and Opening Year for Construction (2029) and Operation (2032) within 2km of the EIA Scoping Area

| Pollutant         | Annual mean Limit Value | 2026 (2025 for PM) | 2029       | 2030 (as representative of 2032) |
|-------------------|-------------------------|--------------------|------------|----------------------------------|
| NO <sub>2</sub>   | 40                      | 9.2 - 20.8         | 8.6 – 19.0 | 8.4 - 18.4                       |
| PM <sub>10</sub>  | 40                      | 13.5 - 16.3        | -          | 13.6 - 16.3                      |
| PM <sub>2.5</sub> | 20                      | 8.5 - 10.9         | -          | 8.5 - 10.9                       |

## Key Human Receptors

- 15.4.19 Human receptors include locations where members of the public could be present for both short or long periods, for example, residential properties,

schools, hospitals, doctors' surgeries, places of worship, shops, playing fields/parks and Public Rights of Way ('PRoW').

- 15.4.20 The Proposed Development is located predominately in a rural location with sporadic residential properties within 250m (and in some instances within 20m) of the EIA Scoping Area. For some components of the Proposed Development, the EIA Scoping Area includes more populated areas such as areas within the towns of Lowestoft, Saxmundham and Halesworth and villages of Hopton-on-Sea, Blundeston, Geldeston, Yaxley, Mellis and Brome.

### Key Ecological Receptors

- 15.4.21 There are numerous ecological receptors within 50m of the EIA Scoping Area boundary including Sizewell Marshes SSSI, Minsmere-Walberswick Heaths and Marshes SAC, SPA, SSSI and Ramsar site, ancient veteran trees, CWSs and parcels of ancient woodland. Further details are provided in chapter 6 terrestrial biodiversity.
- 15.4.22 Table 15-4 presents baseline deposition and background values for designated ecological sites within 50m of the EIA Scoping Area. This study area is in line with IAQM Construction Dust Guidance, which considers potential ecological receptors up to 50m from where dust generating activities may occur. These designated ecological sites are also presented in Figure 15-2.
- 15.4.23 More ecological receptors will be scoped into the assessment in the ES, such as those within 200m of the roads used by construction traffic, once further information on the construction and decommissioning traffic routing for the Proposed Development is available.
- 15.4.24 The baseline deposition information has been published by the Centre for Ecology and Hydrology and are available from the APIS website. Further explanation of the critical loads, acid and nitrogen deposition and ammonia (NH<sub>3</sub>) are provided in Section 15.8. Information on background NO<sub>x</sub>



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concentrations at the designated ecological sites presented in Table 15-4 was obtained from Defra background map datasets rather than APIS.

- 15.4.25 It should be noted there are numerous ancient and veteran trees within 50m of the EIA Scoping Area. Although they would be considered in any assessment, these have not been included in Table 15-4 given the amount of these trees identified. However, the baseline deposition and background values for the ancient and veteran trees are likely to be similar to those presented for broadleaved deciduous woodland in Table 15-4 below.

Table 15-4: Baseline Deposition and Background Values from APIS (2020 – 2022) and Defra (2026) at Key Designated Ecological Sites within 50m of EIA Scoping Area

| Designated Ecological Site                                      | Habitat Type                                     | Critical Load (CL) (kEqH+/ha-yr) |        |        | Existing Acid Deposition (kEqH+/ha/yr) | Existing Nutrient N Deposition (kg N/ha/yr) | Minimum CL (kgN/ha/yr) | Background Annual Mean NH <sub>3</sub> Concentration (µg/m <sup>3</sup> ) | Defra Annual Mean NO <sub>x</sub> Concentration (µg/m <sup>3</sup> ) |
|-----------------------------------------------------------------|--------------------------------------------------|----------------------------------|--------|--------|----------------------------------------|---------------------------------------------|------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------|
|                                                                 |                                                  | CLMaxS                           | CLMinN | CLMaxN |                                        |                                             |                        |                                                                           |                                                                      |
| Sizewell Marshes SSSI                                           | Moist or wet mesotrophic to eutrophic hay meadow | Habitat not sensitive to acidity |        |        |                                        | 12.40                                       | 15                     | 1.20                                                                      | 6.1                                                                  |
| Minswere-Walberswick Heaths and Marshes Ramsar, SAC, SPA & SSSI | Dry heaths                                       | 0.202                            | 0.714  | 0.916  | 1.00                                   | 12.90                                       | 5                      | 1.30                                                                      | 6.3                                                                  |
|                                                                 | Broadleaved deciduous woodland                   | 0.272                            | 0.142  | 0.414  | 1.90                                   | 25.20                                       | 10                     |                                                                           |                                                                      |
| Gunton Warren CWS                                               | Dwarf shrub heath                                | 0.880                            | 0.892  | 1.772  | 0.94                                   | 12.18                                       | 5                      | 1.19                                                                      | 10.3                                                                 |
| River Waveney CWS                                               | Fen, marsh and swamp                             | Habitat not sensitive to acidity |        |        |                                        | 11.68                                       | 5                      | 1.45                                                                      | 10.0                                                                 |
| Blyth Wood ancient woodland                                     | Broadleaved deciduous woodland                   | 10.780                           | 0.142  | 10.922 | 2.22                                   | 29.68                                       | 10                     | 1.80                                                                      | 8.4                                                                  |

| Designated Ecological Site       | Habitat Type                   | Critical Load (CL)<br>(kEqH+/ha-yr) |        |        | Existing Acid Deposition<br>(kEqH+/ha/yr) | Existing Nutrient N Deposition (kg N/ha/yr) | Minimum CL<br>(kgN/ha/yr) | Background Annual Mean NH <sub>3</sub> Concentration (µg/m <sup>3</sup> ) | Defra Annual Mean NO <sub>x</sub> Concentration (µg/m <sup>3</sup> ) |
|----------------------------------|--------------------------------|-------------------------------------|--------|--------|-------------------------------------------|---------------------------------------------|---------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------|
|                                  |                                | CLMaxS                              | CLMinN | CLMaxN |                                           |                                             |                           |                                                                           |                                                                      |
| Stanley Hills CWS                | Acid grassland                 | 4.130                               | 0.223  | 4.353  | 1.22                                      | 15.96                                       | 5                         | 1.80                                                                      | 8.1                                                                  |
| Meadows at Boon's Plantation CWS | Acid grassland                 | 4.130                               | 0.223  | 4.353  | 1.25                                      | 16.66                                       | 5                         | 1.86                                                                      | 7.3                                                                  |
| Big Wood ancient woodland        | Broadleaved deciduous woodland | 10.797                              | 0.214  | 11.011 | 2.21                                      | 30.10                                       | 10                        | 1.77                                                                      | 6.2                                                                  |
| Hencoop Wood ancient woodland    | Broadleaved deciduous woodland | 8.376                               | 0.357  | 8.733  | 2.16                                      | 29.26                                       | 10                        | 1.64                                                                      | 6.2                                                                  |
| Theberton Woods CWS              | Broadleaved deciduous woodland | 8.399                               | 0.357  | 8.756  | 1.90                                      | 25.76                                       | 10                        | 1.34                                                                      | 6.1                                                                  |
| Leiston Airfield CWS             | Broadleaved deciduous woodland | 8.399                               | 0.357  | 8.756  | 1.90                                      | 25.76                                       | 10                        | 1.34                                                                      | 6.1                                                                  |
| Sizewell Levels and              | Coniferous woodland            | 1.120                               | 0.142  | 1.262  | 1.74                                      | 23.66                                       | 3                         | 1.16                                                                      | 6.1                                                                  |

| Designated Ecological Site | Habitat Type | Critical Load (CL) (kEqH+/ha-yr) |        |        | Existing Acid Deposition (kEqH+/ha/yr) | Existing Nutrient N Deposition (kg N/ha/yr) | Minimum CL (kgN/ha/yr) | Background Annual Mean NH <sub>3</sub> Concentration (µg/m <sup>3</sup> ) | Defra Annual Mean NO <sub>x</sub> Concentration (µg/m <sup>3</sup> ) |
|----------------------------|--------------|----------------------------------|--------|--------|----------------------------------------|---------------------------------------------|------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------|
|                            |              | CLMaxS                           | CLMinN | CLMaxN |                                        |                                             |                        |                                                                           |                                                                      |
| Associated Areas CWS       |              |                                  |        |        |                                        |                                             |                        |                                                                           |                                                                      |

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### **Proposed AWRP**

- 15.4.26 All concentrations in the proposed AWRP section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed AWRP section of the EIA Scoping Area is located on the outskirts of the town of Hopton on Sea and encompasses a section of the A47 (Lowestoft Road). There are sensitive human receptors (including residential properties) within 50m of this section of the EIA Scoping Area. The closest relevant ecological receptor is an ancient veteran tree, which is located on Jay Lane less than 20m from this section of the EIA Scoping Area.

### **Proposed Long Sea Outfall ('LSO')**

- 15.4.27 All concentrations in the proposed LSO section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. Should the option to construct a new LSO be progressed (i.e. Option 1), the proposed LSO would be located beyond the coastline at Hopton-on-Sea. There are sensitive human receptors (including residential properties) within 250m of this section of the EIA Scoping Area. Furthermore, the proposed LSO would be located within the Outer Thames Estuary SPA and Southern North Sea SAC.

### **Proposed Central Service Reservoir ('CSR')**

- 15.4.28 All concentrations in the proposed CSR section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed CSR section of the EIA Scoping Area is located on the outskirts of the small hamlet of Sibton Green. There are sporadic sensitive human receptors (including residential properties) within 250m of this section of the EIA Scoping Area. The closest relevant ecological receptor is a parcel of ancient woodland within 10m of this section of the EIA Scoping Area.

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### **Proposed Western Service Reservoir ('WSR')**

- 15.4.29 All concentrations in the WSR section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed WSR section of the EIA Scoping Area is located in the vicinity of the village of Brome. There are sensitive human receptors (including residential properties) within 250m (including within 20m) of this section of the EIA Scoping Area. The closest relevant ecological receptor is a CWS within this section of the EIA Scoping Area.

### **Proposed AWRP to River Waveney Pipeline**

- 15.4.30 All concentrations in the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area passes near the villages of Blundeston, Geldeston, Burgh St Peter, Aldeby and Toft Monks. There are sensitive human receptors (including residential properties) within 250m of this section of the EIA Scoping Area. The proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area crosses the River Waveney CWS.

### **Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline**

- 15.4.31 All concentrations in the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area will pass near the villages of Wissett and Walpole and town of Halesworth. There are sensitive human receptors (including residential properties) within 250m of this section of the EIA Scoping Area. Furthermore, there are approximately 50 ancient veteran trees within or less than 100m from this section of the EIA Scoping Area.

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### **Proposed CSR to WSR Pipeline**

- 15.4.32 All concentrations in the proposed CSR to WSR Pipeline section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed CSR to WSR Pipeline section of the EIA Scoping Area passes near the villages of Wilby and Horham before approaching the village of Brome. There are sensitive human receptors (including residential properties) within 250m of this section of the EIA Scoping Area. The closest relevant ecological receptor is a parcel of ancient woodland within 10m of this section of the EIA Scoping Area.

### **Proposed CSR to Saxmundham Pipeline**

- 15.4.33 All concentrations in the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area runs less than 40m from a static caravan site off Rendham Road before arriving in the town of Saxmundham. There are sensitive human receptors (including residential properties) within 250m (including within 20m) of this section of the EIA Scoping Area. The closest relevant ecological receptors are parcels of ancient woodland less than 30m from this section of the EIA Scoping Area near Pump House Lane.

### **Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline**

- 15.4.34 All concentrations in the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area passes near the villages of Kesale and Theberton before arriving at SZC. There are sensitive human receptors (including residential properties) within 250m of this section of the EIA Scoping Area. The closest ecological receptors are Theberton Woods CWS, Leiston Airfield CWS, Sizewell Levels and

Associated Areas CWS, and Sizewell Marshes SSSI, which are either within or less than 50m from this section of the EIA Scoping Area.

Minswere-Walberswick Heaths and Marshes SAC, SPA, SSSI and Ramsar site is located within 50m of this section of the EIA Scoping Area.

### **Proposed Eastern Distribution Mains**

- 15.4.35 All concentrations in the proposed Eastern Distribution Mains section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed Eastern Distribution Mains section of the EIA Scoping Area is on the outskirts of the villages of Brome, Yaxley and Mellis. There are sensitive human receptors (including residential properties) within 250m (including within 20m) of this section of the EIA Scoping Area. The closest relevant ecological receptor is a CWS (Broome Field) within this section of the EIA Scoping Area.

### **Proposed Western Distribution Mains**

- 15.4.36 All concentrations in the proposed Western Distribution Mains section of the EIA Scoping Area are below the relevant human health based AQOs, Limit Values and targets in the baseline data above. The proposed Western Distribution Mains section of the EIA Scoping Area borders the village of Finningham. There are sensitive human receptors (including residential properties) within 250m (including within 20m) of this section of the EIA Scoping Area. The closest relevant ecological receptor is a CWS within this section of the EIA Scoping Area.

## **15.5 Likely Significant Effects**

- 15.5.1 The Proposed Development has the potential to affect air quality and odour during its construction, operational and decommissioning phases. This section outlines each of the potential significant effects for the construction, operational and decommissioning phases, followed by sensitive receptors.



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## Construction Phase

### Dust Emissions

- 15.5.2 The extent of dust emissions generated from earthworks, construction and trackout activities associated with the Proposed Development would depend on a variety of conditions including the type and scale of activities, weather conditions, vehicle movements and the nature (in terms of the surface material) of the construction haul routes. These activities could lead to increased short-term and long-term concentrations of fine particulate matter (i.e. PM<sub>10</sub> and PM<sub>2.5</sub>) at off-site locations, which could lead to adverse impacts on amenity, affect health at sensitive human receptors and cause damage to vegetation and ecosystems where very high levels of dust soiling occur.
- 15.5.3 The primary construction activities associated with the Proposed Development include construction of the AWRP, a new pumping station at the existing Lowestoft Water Recycling Centre ('WRC'), the proposed CSR and WSR and a network of pipelines totalling up to 120km in length. Construction activities will also be undertaken for the associated development such as landscaping, accesses, utility connections and temporary works including the main and satellite compounds and material laydown areas.
- 15.5.4 Given the scale and proximity of the construction works associated with the Proposed Development to nearby sensitive receptors, such as residential properties, an assessment in the ES is required to determine the risk associated with dust emissions in order to identify the required level of mitigation and monitoring to reduce the likelihood of significant effects.

### Vehicle Exhaust Emissions

- 15.5.5 Emissions of pollutants to air from vehicles travelling on the local road network (e.g. HDVs delivering material and LDVs transporting construction workers) could lead to increases in pollutant concentrations (comprising nitrogen dioxide (NO<sub>2</sub>) and PM<sub>10</sub>/PM<sub>2.5</sub>) at sensitive human receptors adjacent to the local road network and increases in oxides of nitrogen

(NO<sub>x</sub>), ammonia (NH<sub>3</sub>), nutrient nitrogen and acid deposition at sensitive ecological receptors adjacent to the local road network. Therefore, these emissions could have the potential to effect local air quality.

- 15.5.6 At this scoping stage, anticipated construction-related traffic flow data are yet to be finalised. Therefore, as a precautionary approach, an assessment of the effects of emissions of pollutants to air from associated construction vehicles are proposed to be scoped into the ES. However, this will be kept under review as more accurate construction-related traffic information becomes available.
- 15.5.7 Further details on the Proposed Development in the context of road traffic are provided in chapter 13 traffic and access.

#### NRMM, Generator and Combustion Plant Emissions

- 15.5.8 During construction, there would be emissions from construction plant and machinery. The type and numbers of construction plant would vary over the construction period and across the different Proposed Development component areas.
- 15.5.9 The IAQM Construction Dust Guidance states *'Experience of assessing the exhaust emissions from on-site plant (also known as Non-road Mobile Machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed'*.
- 15.5.10 Although the total numbers of construction plant and machinery required for the different components of the Proposed Development are likely to be relatively high, the anticipated works are set over a large spatial area and would not be carried out simultaneously (currently assuming a 3-year construction programme from 2029-2032). Furthermore, due to the predominately rural location of the Proposed Development, the background NO<sub>2</sub> and PM concentrations (refer to Section 15.4 for further details) in the vicinity of the Proposed Development are likely to be relatively low and well below the relevant AQO or Limit Value (refer to Section 15.8 for further

details). Therefore, the likely effect on local air quality at human and ecological receptors in the vicinity of the construction works would be negligible.

- 15.5.11 However, as anticipated construction plant and machinery are yet to be finalised, as a precautionary approach, an assessment of likely significant effects resulting from emissions of pollutants to air from associated construction plant and machinery is proposed to be scoped into the ES. However, this assessment may be subsequently scoped out of the ES, should more information become available that supports the conclusion of no significant effects. A supporting justification would be provided in the ES for the scoping out of the assessment.

### Odour Emissions

- 15.5.12 Earthworks activities associated with the Proposed Development, such as topsoil stripping or excavation to facilitate construction of the proposed CSR and WSR, lagoons and pipeline routes, may generate odours associated with soils and vegetation but these would not be considered as offensive (compared to odours associated with processes such as those involving septic effluent or sludge, biological landfill or intensive livestock rearing) or likely to generate annoyance and subsequent complaints. Should earthworks activities be undertaken in contaminated areas, which may contain odorous materials (such as historic landfills), these would be managed through the application of good practice and appropriate controls/mitigation as agreed with the relevant local authority through the implementation of a suitable odour management plan.
- 15.5.13 At this scoping stage, it is considered that there should be no significant sources of odour associated with the construction of the Proposed Development. However, as a precautionary approach, an assessment of the likely significant effects resulting from odour emissions are proposed to be scoped into the ES. However, this assessment may be subsequently scoped out of the ES, should more information become available that

supports the conclusion of no significant effects. A supporting justification would be provided in the ES for the scoping out of the assessment.

## Operational Phase

### Vehicle Exhaust Emissions

- 15.5.14 For operational vehicles (e.g. workers), there would be activities associated with day-to-day operation, maintenance, repair, refurbishment or replacement of the various components of the Proposed Development. Although anticipated operational-related traffic flow data are yet to be finalised, these would be on a considerably smaller scale than required for construction.
- 15.5.15 Therefore, any air quality impacts of the Proposed Development's operational vehicle exhaust emissions would be negligible as they are likely to be below the EPUK and IAQM Planning Guidance screening threshold discussed in Section 15.2. However, as anticipated operational-related traffic flow data are yet to be finalised, an assessment of the likely significant effects resulting from the Proposed Development's emissions of pollutants to air from associated operational vehicles is proposed to be scoped into the ES. However, this assessment may be subsequently scoped out of the ES, should operational-related traffic information become available that supports the conclusion of no significant effects. A supporting justification would be provided in the ES for the scoping out of the assessment.
- 15.5.16 Further details on the Proposed Development-generated traffic movements are provided in chapter 13 traffic and access.

### NRMM, Generator and Combustion Plant Emissions

- 15.5.17 Based on the likely size (in terms of thermal input capacity) and number of anticipated combustion plant required during operation of the Proposed Development (including the proposed 2.7-megawatt ('MW') backup generator(s) at the proposed AWRP), there is likely to be a negligible impact on air quality.

- 15.5.18 The likely primary mitigation to be implemented (such as an appropriate stack height for any required combustion plant to aid pollutant dispersion), the likely low background concentrations (due to the predominately rural location) and the absence of highly sensitive receptors in the vicinity of the Proposed Development's components, means any impacts are likely to be negligible.
- 15.5.19 However, as anticipated operational plant and machinery are yet to be finalised, as a precautionary approach, an assessment of the likely significant effects resulting from the Proposed Development's emissions of pollutants to air from associated operational plant and machinery is proposed to be scoped into the ES. However, this assessment may be subsequently scoped out of the ES, should information become available that supports the conclusion of no significant effects. A supporting justification would be provided in the ES for the scoping out of the assessment.

### Odour Emissions

- 15.5.20 As the proposed AWRP will receive treated wastewater from the existing Lowestoft WRC and the (covered) proposed CSR and WSR will receive water from the existing Barsham WTW, the potential odour from these components of the Proposed Development is not likely to be offensive. The anticipated primary mitigation to be implemented (such as odour containment as required) and absence of sensitive human receptors in the vicinity of the Proposed Development means there is likely to be a negligible impact on local air quality from all of these components of the Proposed Development.
- 15.5.21 At this scoping stage, it is considered that there should be no significant sources of odour associated with the operation of the Proposed Development. However, as a precautionary approach, an assessment of the likely significant effects resulting from the Proposed Development's odour emissions is proposed to be scoped into the ES. However, this assessment may be subsequently scoped out of the ES, should information

become available that supports this approach. A supporting justification would be provided in the ES for the scoping out of the assessment.

## Decommissioning Phase

### Dust Emissions

15.5.22 Decommissioning activities are anticipated to include the removal of above-ground infrastructure components such as the proposed AWRP, CSR and WSR. The underground infrastructure including pipeline components (and LSO (Options 1, 2 and 3)) are anticipated to be left in situ (but could potentially be removed).

15.5.23 Dust generating activities associated with the decommissioning phase are likely to be smaller in scale than those associated with construction. However, as a precautionary approach, an assessment of the likely significant effects resulting from dust emissions associated with the decommissioning phase is proposed to be scoped into the ES. It should be noted this assessment may be subsequently scoped out of the ES, should information become available that supports the conclusion of no significant effects. A supporting justification would be provided in the ES for the scoping out of the assessment.

### Vehicle Exhaust Emissions

15.5.24 The Proposed Development is assumed to have a minimum operational lifetime of 80 years. As such, road traffic emissions would be much lower than the current baseline conditions, due to improvement in vehicle technology and the increase in zero emissions vehicles.

15.5.25 At this scoping stage, anticipated decommissioning-related traffic flow data are yet to be finalised. Therefore, as a precautionary approach, an assessment of the effects of emissions of pollutants to air from associated vehicles are proposed to be scoped into the ES. However, this will be kept under review as more accurate decommissioning-related traffic information becomes available.

15.5.26 Further details on the Proposed Development in the context of road traffic are provided in chapter 13 traffic and access.

### **NRMM, Generator and Combustion Plant Emissions**

15.5.27 During decommissioning, there would be emissions from associated plant and machinery, the type and numbers of which would vary over the decommissioning period and across the different Proposed Development component areas.

15.5.28 As anticipated plant and machinery are yet to be finalised, as a precautionary approach, an assessment of likely significant effects resulting from emissions of pollutants to air from associated plant and machinery is proposed to be scoped into the ES. However, this assessment may be subsequently scoped out of the ES, should more information become available that supports the conclusion of no significant effects. A supporting justification would be provided in the ES for the scoping out of the assessment.

### **Odour Emissions**

15.5.29 Earthworks activities associated with decommissioning, such as topsoil stripping or excavation to facilitate removal of the above-ground infrastructure components, may generate odours associated with soils and vegetation but these would not be considered as offensive. As discussed in paragraph 15.5.12 for construction, should earthworks activities be undertaken in contaminated areas, which may contain odorous materials, these would be managed through the application of good practice and appropriate controls/mitigation as agreed with the relevant local authority through the implementation of a suitable odour management plan.

15.5.30 At this scoping stage, it is considered that there should be no significant sources of odour associated with the decommissioning of the Proposed Development. However, as a precautionary approach, an assessment of the likely significant effects resulting from odour emissions are proposed to be scoped into the ES. However, this assessment may be subsequently

scoped out of the ES, should more information become available that supports the conclusion of no significant effects. A supporting justification would be provided in the ES for the scoping out of the assessment.

## **15.6 Impacts Scoped Out of the Assessment**

- 15.6.1 At this stage, no air quality or odour impacts are proposed to be scoped out of the assessment during the construction, operational and/or decommissioning phases. However, impacts may be subsequently scoped out of the ES, should more information become available that supports the conclusion of no significant effects.

## **15.7 Proposed Approach to Mitigation**

### **Primary (Inherent) Mitigation**

- 15.7.1 Where practicable, the Proposed Development shall adhere to good principles of design to reduce the impact on local air quality. Examples include selecting locations and indicative layouts for the operational infrastructure that will seek to minimise impacts on the travel networks and thus reduce associated emissions.
- 15.7.2 Even though the design of the proposed AWRP is yet to be finalised, it will incorporate appropriate primary mitigation such as a suitable stack height for the back-up generator(s) to improve pollutant dispersion such that emissions will comply with the relevant emission limit values and standards.

### **Secondary (Foreseeable) Mitigation**

- 15.7.3 At this scoping stage, no secondary mitigation measures are considered necessary during the construction, operational and decommissioning phases of the Proposed Development. However, secondary mitigation measures may be identified during the preparation of the assessment in the ES.



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### Tertiary (Inexorable) Mitigation

- 15.7.4 During the construction and decommissioning phases, the implementation of measures set out in a Construction Environmental Management Plan ('CEMP') and Decommissioning Environmental Management Plan ('DEMP'), in accordance with the Outline Construction Environmental Management Plan ('OCEMP') and the Outline Decommissioning Environmental Management Plan ('ODEMP'), respectively, to be submitted with the DCO application, would help to minimise potentially significant air quality and odour effects on sensitive receptors.
- 15.7.5 As a minimum, tertiary (or good practice) dust mitigation measures to ensure minimal dust emissions, as described in the IAQM Construction Dust Guidance, would be applicable during the construction and decommissioning phases (where appropriate). Examples of such measures are listed below:
- Planning site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
  - Ensure all vehicles switch off engines when stationary - no idling vehicles.
  - Ensure an adequate water supply for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
  - Avoid bonfires and burning of waste materials.
  - Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport.
  - Avoiding site runoff of water or mud.
- 15.7.6 For construction-related vehicles, emissions will meet low vehicle emission standards for oxides of nitrogen (NO<sub>x</sub>) and particulate matter (PM, where the subscript denotes the particle diameter (e.g. PM<sub>10</sub> or PM<sub>2.5</sub>)), where practicable. The use of electric or hydrogen fuel may also be considered.

## 15.8 Proposed Approach to the ES

### Best Practice Guidance

- 15.8.1 The relevant best practice guidance that has been used as part of the EIA scoping process for air quality and odour are detailed below:
- IAQM construction dust guidance.
  - EPUK and IAQM Planning Guidance.
  - Defra Local Air Quality Management Technical Guidance (TG22) [22].
  - EA Environmental Permit Guidance.
  - IAQM Odour Planning Guidance.
  - EA Environmental permitting: air dispersion modelling reports [23] (the 'EA Modelling Reports Guidance').
  - IAQM's A guide to the assessment of air quality impacts on designated nature conservation sites, Version 1.1 [24] (the 'IAQM Designated Nature Conservation Guidance').
  - National Highways (formerly Highways England) - Design Manual for Roads and Bridges LA 105 Air quality (vertical barriers) [25] (the 'DMRB LA 105 Guidance').

### Pollutants of Interest

- 15.8.2 The main pollutants of interest associated with the Proposed Development's construction, operational and decommissioning phases, as discussed in Section 15.1, are NH<sub>3</sub>, NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. The assessment will also include nitrogen and acid deposition which have site-specific critical loads.
- 15.8.3 The corresponding AQOs, Limit Values, targets and critical levels for the main pollutants of interest are presented in Table 15-5 which would be used to assess the impact at human receptors (with the exception of NH<sub>3</sub> and NO<sub>x</sub> which are applied to designated ecological sites). Refer to Appendix 15.1 for further description of the AQOs, Limit Values, targets and critical levels.

Table 15-5: Relevant Air Quality Standard

| Pollutant                               | Concentration                                                      | Averaging Period | Type                                                                                                                                                                           |
|-----------------------------------------|--------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nitrogen Oxides (NO <sub>x</sub> )      | 30µg/m <sup>3</sup>                                                | Annual mean      | AQO/Limit Value                                                                                                                                                                |
|                                         | 75µg/m <sup>3</sup>                                                | 24-hour mean     |                                                                                                                                                                                |
| Nitrogen Dioxide (NO <sub>2</sub> )     | 200µg/m <sup>3</sup> not to be exceeded more than 18 times a year  | 1-hour mean      | AQO/Limit Value                                                                                                                                                                |
|                                         | 40µg/m <sup>3</sup>                                                | Annual mean      |                                                                                                                                                                                |
| Particulate Matter (PM <sub>10</sub> )  | 50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year | 24-hour mean     | AQO/Limit Value                                                                                                                                                                |
|                                         | 40µg/m <sup>3</sup>                                                | Annual mean      |                                                                                                                                                                                |
| Particulate Matter (PM <sub>2.5</sub> ) | 20µg/m <sup>3</sup> – used for assessment of PM <sub>2.5</sub>     | Annual mean      | Limit Value                                                                                                                                                                    |
|                                         | 10µg/m <sup>3</sup>                                                | Annual mean      | Interim target of 10µg/m <sup>3</sup> to be met by 2030 (not legally binding). Target concentration of 10 µg/m <sup>3</sup> to be met across England by 2040 (legally binding) |
| Ammonia (NH <sub>3</sub> )              | 1µg/m <sup>3</sup>                                                 | Annual mean      | Lichens and bryophytes (where they form a key part of the ecosystem integrity)                                                                                                 |
|                                         | 3µg/m <sup>3</sup>                                                 | Annual mean      | Other vegetation                                                                                                                                                               |

15.8.4 Whilst it is acknowledged that annual mean PM<sub>2.5</sub> concentration targets can be used for local assessment purposes, the calculation of population exposure [26] targets are not applicable to a local scale, as it is calculated at a national level. Therefore, the population exposure targets have not been included in Table 15-5 above and would not be expected to be reported within the assessment of the Proposed Development's likely significant effects on air quality. However, the interim annual average

concentration target of  $10\mu\text{g}/\text{m}^3$  will be used to consider  $\text{PM}_{2.5}$ . It is assumed that by meeting the interim 2030 target, the 2040 target is likely to be met, due to national measures.

- 15.8.5 It is important to recognise the difference between Limit Values (i.e., legally binding parameters for which compliance is determined at a national level by government) and AQOs (i.e., policy targets set by local authorities under LAQM [27] and generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances, within a specified timescale). Whilst Limit Values and AQOs for the relevant pollutants are typically set at the same concentration value, the means of determining compliance are fundamentally different and they must be considered separately.
- 15.8.6 Critical loads (i.e. nutrient nitrogen and acid deposition) for statutorily designated ecological sites in the UK and for various habitat types have been published by the Centre for Ecology and Hydrology and are available from the APIS website. The critical loads will be used to assess the impacts on designated habitats where relevant, as discussed in the following sections on 'Effect Significance'. Critical loads are defined on the APIS website as:
- 'A quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge'.*
- 15.8.7 The critical loads for each of the designated ecological sites considered in this Scoping Report are set out in Table 15-4, additional designated ecological sites may be added during the assessment in the ES once the full study area is known (refer to Section 15.2 for the discussion on how the study areas will be defined for the assessment in the ES).
- 15.8.8 Critical levels, which are also available from the APIS website, can be defined as the ambient concentration above which direct adverse effects on ecological receptors may occur according to present knowledge. Unlike

critical loads, these values are not habitat specific but have been set to cover broad vegetation types (see Table 15-5).

- 15.8.9 For potential odour emissions generated by the Proposed Development, a risk-based qualitative assessment will be undertaken to consider the potential for odour effects at human receptor locations. Should the qualitative study indicate that odour effects may occur at nearby sensitive receptors, detailed assessment will be undertaken using air dispersion modelling techniques. Where relevant, the odour assessment will draw on the approach set out in the IAQM Odour Planning Guidance.

### Dust Effects Assessment Methodology

- 15.8.10 Construction and decommissioning of the Proposed Development have the potential to generate dust, which can cause annoyance and negative health effects on residents and harm to nearby ecological receptors.
- 15.8.11 The dust risk assessment is to be carried out in accordance with the IAQM Construction Dust Guidance for 2-4 'worst case' locations (rather than assessing the whole of the Proposed Development). The 'worst case' locations will be based on the proximity, type and number of receptors close to dust generating activities. The 'worst case' locations will be used to identify the mitigation measures needed across the whole of the Proposed Development. The IAQM Construction Dust Assessment Guidance's methodology provides approaches to consider three separate dust effects:
- Annoyance to human receptors due to dust soiling.
  - Harm to ecological receptors.
  - Risk of human health effects due to increased exposure to PM<sub>10</sub> and PM<sub>2.5</sub>.
- 15.8.12 The methodology for the assessment of the construction and decommissioning impacts would be based on a five-step approach as set out in Figure 15-3.

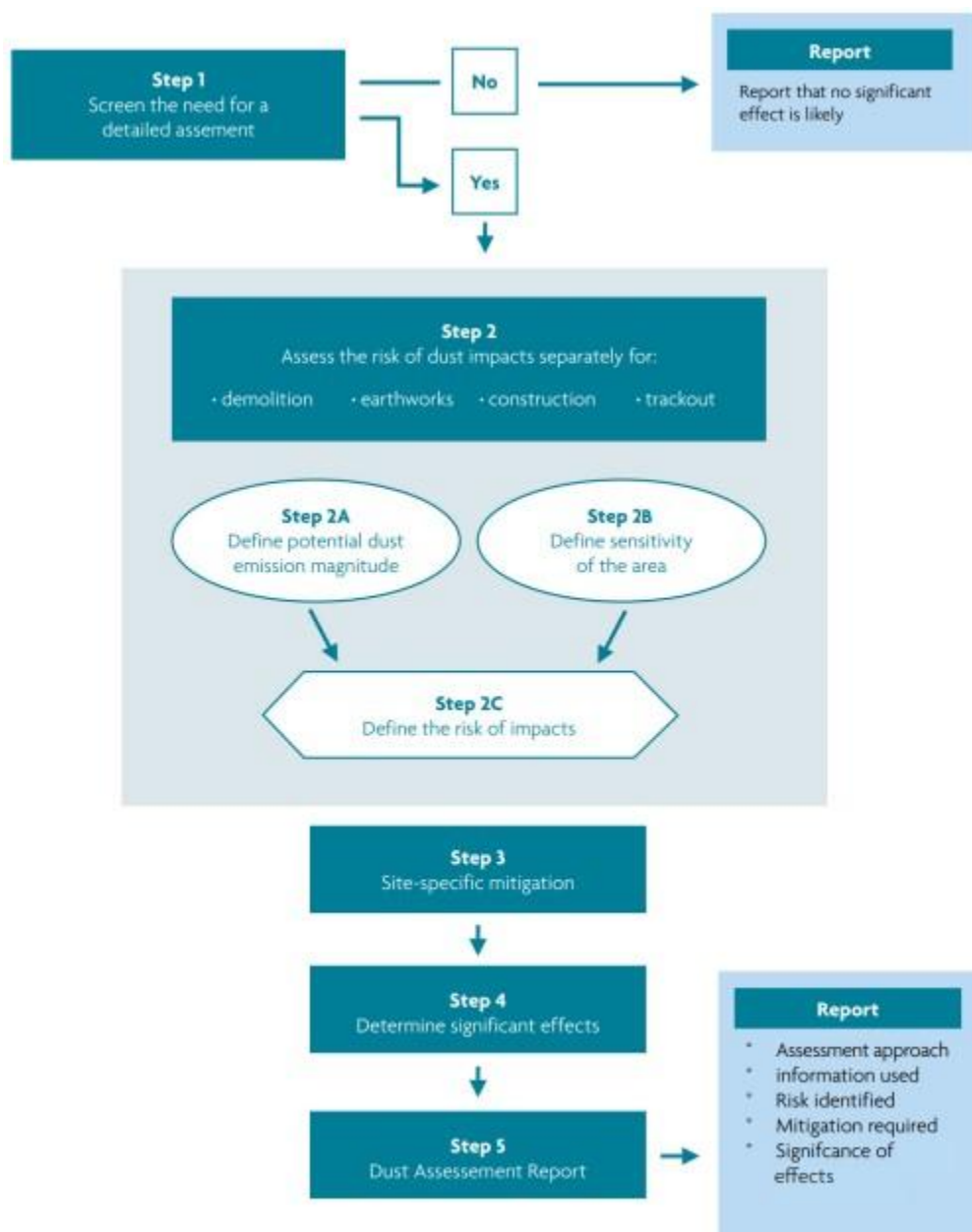


Figure 15-3: Structure of the Dust Risk Assessment

### Sensitivity of Receptor

15.8.13 Table 15-6 presents indicative examples of classification groups for the varying sensitivities of people to dust soiling impacts, to the health impacts of PM<sub>10</sub> and the sensitivities of receptors to ecological impacts. A judgement is made at the site-specific level where sensitivities may be higher or lower, for example a soft fruit business may be more sensitive to soiling than an alternative industry, such as coal mining, in the same location. Section 7.3

within the IAQM Construction Dust Guidance outlines more detailed parameters for defining sensitivity.

Table 15-6: Indicative Examples of the Sensitivity of Different Types of Receptors

| Sensitivity of Receptor | Sensitivities of People and Ecological Receptors                                                                             |                                                                          |                                                                                                                                                                                                                                                                                                                  |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | Dust Soiling Activities Impacts <sup>1</sup>                                                                                 | Health Impacts of PM <sub>10</sub> <sup>2</sup>                          | Ecological Impacts <sup>3</sup>                                                                                                                                                                                                                                                                                  |
| High                    | Residential dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms. | Residential properties, hospitals, schools and residential care homes.   | Locations with an international or national designation and the designated features may be affected by dust soiling (e.g. SAC/SPA/Ramsar site). Locations where there is a community of a particular dust sensitive species such as vascular plant species included in the Red Data list for Great Britain [28]. |
| Medium                  | Parks, places of work.                                                                                                       | Office and shop workers not occupationally exposed to PM <sub>10</sub> . | Locations where there is a particularly important plant species, where dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition (e.g. SSSI).                                                                                        |
| Low                     | Playing fields, farmland, footpaths, short-term car parks and roads.                                                         | Public footpaths, playing fields, parks and shopping streets.            | Locations with a local designation where the features may be affected by dust deposition (e.g. LNR).                                                                                                                                                                                                             |

Note 1: People's expectations would vary depending on the existing dust deposition in the area.

Note 2: This follows the Defra guidance as set out in Local Air Quality Management Technical Guidance (LAQM.TG (22)).

Note 3: A Habitats Regulations Assessment of the Proposed Development may be required as part of the planning process if the Proposed Development lies close to an international site (i.e. SACs/SPAs) designated under the Habitats Directive (92/43/EEC) and Ramsar sites.

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### Impact Magnitude

- 15.8.14 As per the IAQM Construction Dust Guidance, the potential dust emission magnitude is based on the scale of the anticipated works and is classified as small, medium or large. The sensitivity of the area, which is described as low, medium or high, takes a number of factors into account including specific sensitivities, proximity and number of receptors in the area and background PM<sub>10</sub> concentrations.
- 15.8.15 As shown in Figure 15-3 the potential dust emission magnitude along with the sensitivity of the area are then used to determine the risk of dust impacts. Following the identification of the overall risk category for the demolition, earthworks, construction and trackout activities, appropriate mitigation measures can then be identified from the IAQM Construction Dust Guidance for the Proposed Development.

### Effect Significance

- 15.8.16 The recommended risk related mitigation measures should be sufficient to reduce emissions of dust so that a significant effect would not occur at off-site receptors.
- 15.8.17 The IAQM Construction Dust Guidance states the following:
- ‘For almost all construction activity, the aim should be to prevent significant impacts on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be ‘not significant’.*
- 15.8.18 It should be noted the significance of dust effects is defined as either ‘significant’ or ‘not significant’: it is ‘significant’ before mitigation, but ‘not significant’ with mitigation. Unlike other environmental disciplines, it does not include a scale of significance or consider specific receptors.

### Exhaust Emissions from Vehicles Assessment Methodology

- 15.8.19 The methodology for assessment of road traffic emissions associated with the construction (‘worst case’ construction scenario only), operational and



decommissioning phases of the Proposed Development will be defined based on the EPUK and IAQM Planning Guidance as appropriate at the time of assessment.

- 15.8.20 The EPUK and IAQM Planning Guidance screening criteria provided in Section 15.2 is initially used to determine whether an assessment is likely to be required. If further assessment is required, relevant sensitive receptors will be selected within 200m of 'affected' roads. These receptors will represent locations that are likely to be exposed for the appropriate averaging time (dependent on the AQO, Limit Value or target value being assessed against).
- 15.8.21 The assessment will use the most recent version of the Defra Emissions Factors Toolkit [29] and associated tools for the earliest construction, operational and decommissioning years of the Proposed Development. Detailed dispersion modelling using the latest version of Cambridge Environmental Research Consultants Ltd's ('CERC') Atmospheric Dispersion Modelling System ('ADMS')-Roads [30] software will be carried out for worst-case receptors to estimate annual mean NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations for the 'Do Nothing' (i.e., without the Proposed Development) and 'Do Something' (i.e., with the Proposed Development) scenarios. These modelled concentrations are then added to existing background concentrations to provide total concentrations.
- 15.8.22 Estimated NO<sub>x</sub> will be converted to NO<sub>2</sub> using the latest version of the Defra NO<sub>x</sub> to NO<sub>2</sub> tool [31].
- 15.8.23 As per LAQM TG (22) guidance, verification of the air dispersion model will compare base year modelled road NO<sub>x</sub> concentrations with monitored road NO<sub>x</sub> to account for any systematic bias in the air quality dispersion modelling approach, subject to available pre-existing monitoring data.
- 15.8.24 For designated ecological site receptors, NO<sub>x</sub>, nutrient nitrogen, acid deposition and NH<sub>3</sub> [32] calculations will be derived from modelled NO<sub>2</sub> and NO<sub>x</sub> based on the methodology presented in the) DMRB LA 105 Guidance

and the IAQM Designated Nature Conservation Guidance (subject to permission to use the tool from National Highways).

### Sensitivity of Receptor

- 15.8.25 For the assessment of air pollution from road transport, all relevant receptors are classed as high sensitivity receptors where annual average exposure may occur. In the UK, short-term exposure to high road traffic-related air quality is highly unlikely and it is the annual averages that are therefore the focus of any assessment.

### Impact Magnitude

- 15.8.26 The impacts of the Proposed Development in relation to compliance with the Limit Values (see Table 15-5) will also be assessed based on the DMRB LA 105. Initially, qualifying features (i.e. a sensitive receptor or public access within 15m of the edge of the running lane (excludes the hard shoulder)/kerbside, and outside of 25m of a junction)) will be identified for any PCM [33] links, that correspond to the 'affected' roads (namely locations of public access (e.g. footpaths)) and sensitive receptors (e.g. residential properties and schools). If no qualifying features are found for these links, or if no PCM links correspond to the affected road network ('ARN'), PCM receptors will not be included. If qualifying features on PCM links corresponding to the ARN are found, selected receptors representing qualifying features with the potential to be affected will be modelled to assess whether concentrations are below the relevant Limit Values. A risk to compliance would be identified where:
- There are modelled exceedances of the air quality thresholds for any PCM link and the change in annual mean concentrations is greater than 1% of the Limit Value (e.g. +/-0.4 µg/m<sup>3</sup> for NO<sub>2</sub>).
  - The Proposed Development materially impacts on measures within local air quality or national plans for the achievement of compliance.

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## Effect Significance

15.8.27 In determining significance, the following will be considered:

- The qualifying feature being affected such as little used or heavily used footpaths, residential properties, schools, etc i.e. the sensitivity of receptor.
- The level of change in concentration as a result of the Proposed Development and whether there is an overall worsening or improvement i.e. impact magnitude.

15.8.28 The assessment of significance for the AQOs and Targets for human health, will be assessed on the basis of the EPUK and IAQM Planning Guidance. This guidance sets out the framework for describing air quality impacts, whether adverse or beneficial, from a dispersion modelling assessment that can be used as a starting point to make a judgement of the overall significance of the effect. It should be noted that an impact is the change in the concentration of an air pollutant, as experienced by a receptor, as a result of the Proposed Development. The guidance states the following:

*'...the assessment may use its own set of criteria to define magnitude, but the important matter to be concluded is the likely significant effects of the impacts on air quality. There is, therefore, a two-stage process to be followed in the assessment:*

- *A qualitative or quantitative description of the impacts on local air quality arising from the development; and*
- *A judgement on the overall significance of the effects of any impacts.'*

15.8.29 As per the EPUK and IAQM Planning Guidance, the impact descriptors for individual receptors to be used for long-term (i.e. annual mean) concentrations are presented in Table 15-7. If all receptors are classed as having slight or negligible impacts, then the overall impact will be considered as not significant. If some receptors are classed as having moderate or substantial impacts, then a judgement will be made on the number and locations of these receptors as to whether the overall the impact should be considered as significant.

Table 15-7: Impact Descriptors for Individual Receptors (Long-term Concentrations)

| Long-term Average Concentration at Receptor in Assessment Year | % Change in Concentration Relative to the Environmental Quality Standard ('EQS') |             |             |             |
|----------------------------------------------------------------|----------------------------------------------------------------------------------|-------------|-------------|-------------|
|                                                                | 1                                                                                | 2-5         | 6-10        | >10         |
| 75% or less of EQS                                             | Negligible                                                                       | Negligible  | Slight      | Moderate    |
| 76-94% of EQS                                                  | Negligible                                                                       | Slight      | Moderate    | Moderate    |
| 95-102% of EQS                                                 | Slight                                                                           | Moderate    | Moderate    | Substantial |
| 103-109% of EQS                                                | Moderate                                                                         | Moderate    | Substantial | Substantial |
| 110% or more of EQS                                            | Moderate                                                                         | Substantial | Substantial | Substantial |

15.8.30 Potential significance for designated ecological sites will be based on the whether the change in NO<sub>x</sub>, NH<sub>3</sub>, nutrient nitrogen or acid deposition is greater than 1% of the critical level or critical load for the assessed site (refer to Table 15-5), as per the DMRB LA 105. Any potential significant effects will be determined by the project ecologists.

### Emissions from Plant and Machinery Assessment Methodology

15.8.31 A review of the anticipated combustion plant required, likely duration of operation and sensitivity of the surrounding area (in terms of baseline conditions), will be carried out to determine if further assessment is required.

15.8.32 If air dispersion modelling is required, then the methodology for the assessment of emissions from plant and machinery (including NRMM) during the Proposed Development's construction, operational and decommissioning phases will be based on EA Environmental Permit Guidance [34] and Modelling Report Guidance and EPUK and IAQM Planning Guidance [35] as appropriate at the time of assessment.

15.8.33 The modelling assessment will be carried out using the latest version of the CERC ADMS air dispersion software [36] to model releases of the identified

substances and will broadly follow the similar approach as described for assessing emissions from traffic. The ADMS model predicts the dispersion of emissions from a specific source (e.g. a stack), and the subsequent concentrations over an identified area (e.g. at ground level across a grid of receptor points) or at specified points (e.g. a residential property).

- 15.8.34 The modelled concentration contribution from the plant/machinery will be combined with existing background concentrations, and the relevant road-related air pollution if the considered receptor is subject to impacts of both road traffic and plant/machinery for annual averages, to provide the total concentration of the pollutant(s) of interest.

### Sensitivity of Receptors

- 15.8.35 For the assessment of plant and machinery (including NRMM) emissions, considered human receptors will represent locations that are likely to be exposed for the appropriate averaging time (dependent on the AQO or Target being assessed against) and that are only relevant to members of the public. Examples of locations where long-term (i.e. annual mean) AQOs or Target levels should apply include residential properties, schools, hospitals and care homes. These are considered high sensitivity receptors. Examples of locations where short-term AQOs or Limit Values should apply include playing fields, bus stops, footpaths and short-term car parks. These are considered low sensitivity receptors.

### Impact Magnitude

- 15.8.36 The total concentration, as discussed in paragraph 15.8.35, will then be assessed against the appropriate level (refer to Table 15-5) for each considered pollutant to determine the nature and extent of any potential adverse effects.

### Effect Significance

- 15.8.37 The significance of the potential changes in annual average pollutant concentrations will be assessed on the basis of the EPUK and IAQM

Planning Guidance (refer to Table 15-7, Table 15-8 and paragraph 15.8.28 for human receptors and paragraph 15.8.30 designated ecological sites).

- 15.8.38 For determining the severity of an effect for short-term concentrations, the EPUK and IAQM Planning Guidance recommends that background concentrations are less important and effects should be described using peak concentrations from the modelled source(s). The EPUK and IAQM Planning Guidance also provides effect descriptors for predicted short-term concentrations, similar to the effect descriptors for long-term concentrations set out in Table 15-7.

Table 15-8: Impact Descriptors for Individual Receptors (Short-term Concentrations)

| % Change in Concentration Relative to the EQS |        |          |             |
|-----------------------------------------------|--------|----------|-------------|
| 10% or less                                   | 11-20% | 21-50%   | >50%        |
| Negligible                                    | Slight | Moderate | Substantial |

- 15.8.39 For assessed ecological receptors, the IAQM Designated Nature Conservation Guidance, which refers to the EA Environmental Permit Guidance, states that further assessment is not required if the concentration contribution at an international or nationally designated ecological site meets both of the following criteria for critical levels (i.e. ambient concentrations) and critical loads (i.e. nutrient nitrogen and acid deposition).
- The Proposed Development's short-term concentration contribution is less than 10% of the short-term critical level for designated ecological sites.
  - The Proposed Development's long-term concentration contribution is less than 1% of the long-term critical level or critical load for designated ecological sites.
- 15.8.40 For assessed local designated ecological sites (e.g. CWSs, LNRs) considered local nature sites, the criteria are less stringent with further assessment not required if the Proposed Development's concentration contribution is less than 100% of the critical level or critical load.
- 15.8.41 It should be noted the IAQM Designated Nature Conservation Guidance [37] states that the 1% and 10% screening criteria described above should not be used rigidly and concludes that:

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*‘It is important to remember that a change of more than 1% does not necessarily indicate that a significant effect (or adverse effect on integrity) will occur; it simply means that the change in concentration or deposition rate cannot in itself be described as numerically inconsequential or imperceptible and therefore requires further consideration’.*

- 15.8.42 The IAQM Designated Nature Conservation Guidance states that further assessment is required if an exceedance of the critical level or critical load is predicted at a designated ecological site and the Proposed Development concentration contribution exceeds 1% of the relevant value either alone or in combination with other projects. It also makes reference to the EA Environmental Permit Guidance that an impact can be considered insignificant if the total concentration is less than 70% of the long-term critical level or critical load, regardless of the Proposed Development’s concentration contribution. Any potential significant effects will be passed to the project ecologists to decide on actual significance.

### **Odour Emissions Assessment Methodology**

- 15.8.43 As per the IAQM Odour Planning Guidance, assessment of potential odour emissions generated by the construction, operational or decommissioning phases of a proposed development can range from a simple qualitative representation of the Source-Pathway-Receptor (S-P-R) concept to quantitative air dispersion modelling.
- 15.8.44 For potential odour emissions generated by the Proposed Development, as discussed previously, a risk-based qualitative assessment will be carried out to consider the potential for odour effects to occur based on the scale of the odorous emissions, distance to nearby sensitive areas or receptors, the prevailing weather conditions and the embedded mitigation or good practice mitigation which would prevent or reduce odour emissions at source. Where relevant, this will draw on the assessment approach set out in the IAQM Odour Planning Guidance.
- 15.8.45 Should the qualitative study indicate that odour effects may occur at nearby sensitive receptors, detailed assessment will be undertaken using air

dispersion modelling techniques similar to that described for emissions from plant and machinery.

## Sensitivity of Receptors

15.8.46 As per IAQM Odour Planning Guidance, Table 15-9 presents indicative examples of classification groups for the varying sensitivities of people to odour impacts.

Table 15-9: Receptor Sensitivity to Odours

| Sensitivity of Receptor | Sensitivities of Human Receptors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                    | <p>Surrounding land where:</p> <ul style="list-style-type: none"> <li>• Users can reasonably expect enjoyment of a high level of amenity; and</li> <li>• People would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.</li> </ul> <p>Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.</p>                                                                                  |
| Medium                  | <p>Surrounding land where:</p> <ul style="list-style-type: none"> <li>• Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or</li> <li>• People would not reasonably be expected to be present here continuously or regularly for</li> <li>• Extended periods as part of the normal pattern of use of the land.</li> </ul> <p>Examples may include places of work, commercial/retail premises and playing/recreation fields.</p> |
| Low                     | <p>Surrounding land where:</p> <ul style="list-style-type: none"> <li>• The enjoyment of amenity would not reasonably be expected; or</li> <li>• There is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.</li> </ul> <p>Examples may include industrial use, farms, footpaths and roads.</p>                                                                                                               |

## Impact Magnitude

15.8.47 The magnitude of the effect experienced by a human receptor is determined by the scale of odour exposure and the sensitivity of the receptor. The



frequency, intensity, duration and offensiveness of the odour can result in a different exposure at a receptor location.

## Effect Significance

15.8.48 Table 15-10 describes a general relationship between the level of odour exposure (impact) experienced by a receptor of a given sensitivity and the magnitude of adverse effect that is likely to result. This general relationship for an odour will apply irrespective of the selected assessment method.

Table 15-10: IAQM Suggested Descriptors for Magnitudes of Odour Effects

| Relative Odour Exposure Impact | Receptor Sensitivity |                     |                     |
|--------------------------------|----------------------|---------------------|---------------------|
| Very Large                     | Moderate adverse     | Substantial adverse | Substantial adverse |
| Large                          | Slight adverse       | Moderate adverse    | Substantial adverse |
| Medium                         | Negligible           | Slight adverse      | Moderate adverse    |
| Small                          | Negligible           | Negligible          | Slight adverse      |
| Negligible                     | Negligible           | Negligible          | Negligible          |

15.8.49 To define the likely significance, the IAQM Odour Planning Guidance states:

*‘Where the overall effect is greater than “slight adverse”, the effect is likely to be considered significant. Note that this is a binary judgement: either it is “significant” or it is “not significant”. Concluding that an effect is significant should not mean, of itself, that a development proposal is unacceptable and the planning application should be refused; rather, it should mean that careful consideration needs to be given to the consequences, scope for securing further mitigation, and the balance with any wider environmental, social and economic benefits that the proposal would bring’.*

## Mitigation and Residual Effects

15.8.50 The assessment in the ES will assess effects both before and after the implementation of mitigation measures:

- Pre-mitigation effects (or 'unmitigated effects'): effects that would occur in the absence of any mitigation.
- Residual effects: effects that remain after the implementation of mitigation measures (primary, secondary, and tertiary), representing a 'cautious 'worst case' approach' in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) [38].

15.8.51 As set out in Section 15.7 above, the assessment will distinguish between:

- Primary (inherent) mitigation: Design features integrated into the Proposed Development.
- Secondary (foreseeable) mitigation: Measures designed to reduce likely significant effects.
- Tertiary (inexorable) mitigation: Measures required by legislation, policy, or standard best practice.

15.8.52 Where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES.

### In-combination Effects

15.8.53 The assessment of in-combination effects will be carried out taking into consideration the potential impacts identified for a given sensitive receptor within the individual assessments of the ES. The assessment will mainly focus on sensitive receptors subject to incremental and/or synergistic residual effects for environmental aspects such as landscape and visual effects and noise and vibration (e.g. temporary noise effects combined with dust and visual effects on human receptors).

15.8.54 It is not possible to assess air quality effects on downstream activities (for example, emissions from industrial facilities that would use the proposed CSR and WSR as a water source). This is because the location and, therefore, baseline environment for such facilities and their design/nature are not yet known such that no assessment can be undertaken. Nevertheless, as these other developments not related to the Proposed Development are known in the future when information on them becomes

available, where possible they will be dealt with as potential sources of inter project effects in the ES. It should also be noted that, while such facilities will be controlled by their own permissions and permits, these cannot guarantee that no significant effects might occur, however, they would make significant effects ‘unlikely’.

### Limitations and Assumptions

- 15.8.55 This chapter is based on information available at the time of writing which may be subject to change as the design of the Proposed Development evolves. Where required, a precautionary approach has been taken and at this scoping stage, it is considered that the information provided is sufficient to identify any likely significant effects from the Proposed Development.
- 15.8.56 During the preparation of the assessment in the ES, where information is not available for the assessment of construction or decommissioning dust emissions, assumptions will be made based on an understanding of the scale and nature of activities and professional judgement.
- 15.8.57 To inform the preparation of the assessment in the ES chapter, further stakeholder engagement will be undertaken, including in respect of the scope of the assessment. Should the assumptions applied at this scoping stage change significantly for the ES stage, the proposed scope of the assessment in the ES will be amended accordingly.
- 15.8.58 Sensitive receptors will be determined using the Ordnance Survey AB+ dataset. There may in some cases be properties, such as those recently built, which are not yet present within these data sources.
- 15.8.59 The local authority data on AQMAs and monitoring data used to inform this scoping chapter has been obtained from publicly available documents and resources. The information that has been used is based on the most recent publicly available information. Despite this limitation, it is considered that the baseline data that is available and presented in this report is sufficient to understand baseline air quality conditions in the study area.

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- 15.8.60 As discussed in paragraph 15.4.7, the impact of COVID-19 travel restrictions on traffic flows will have affected air quality monitoring data for 2020 and to a lesser extent 2021. The use of data in previous and preceding years (especially for 2019 and 2022 onwards) is considered likely to have negated the impact of this limitation.
- 15.8.61 The exact study area is currently unknown and data from the surrounding local authorities have been used to inform the collation of baseline data. During the actual assessment, if additional areas are identified, then further baseline data collection will need to be undertaken to supplement that already collated.
- 15.8.62 Estimates of traffic flow or fuel use are used in an emissions model, the emissions data is then fed into a dispersion model, and a total concentration derived to compare future air quality conditions both with and without the Proposed Development. The air quality models will draw on a number of other trends and parameters that must be projected into the future. The modelling process will include atmospheric dispersion modelling, which provides an estimate of concentrations arising from input emissions and historical meteorological data.
- 15.8.63 As with any computer model that seeks to predict future conditions, there is uncertainty in the predictions made. Elements of impact prediction such as the specific concentration of a given pollutant at a given property, or whether an exceedance of AQOs or Limit Values would or would not occur at a specific location, are not precise and are always subject to a margin of error. However, the assessment process is considered to be based on the most reasonable, robust and representative methodologies, taking advice from published guidance.
- 15.8.64 Any changes to the existing hydrological regime of watercourses during the operational phase of the Proposed Development are not expected to result in likely significant air quality and odour effects on sensitive human and air quality receptors.
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15.8.65 Local authority monitoring data included in Section 15.4 is based on datasets available at the time of writing. More up-to-date versions of some of these datasets are now available. To inform the assessment of likely significant effects in the air quality chapter of the ES, the most up-to-date available data will be used.

## **15.9 Summary of Impacts and Effects**

15.9.1 Table 15-11 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the air quality and odour ES chapter for the construction, operational and decommissioning phases of the Proposed Development.

Table 15-11: Summary of Air Quality and Odour Scope

| Receptor                                 | Effects                                                                                                                                                                                                         | Anticipated Magnitude                                   | Anticipated Importance/ Sensitivity                                     | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                  | Scoped in/ Scoped out                          |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>Construction Phase</b>                |                                                                                                                                                                                                                 |                                                         |                                                                         |                                                |                                                                                                                                             |                                                |
| Sensitive human and ecological receptors | For construction dust, receptors may be subject to annoyance due to dust soiling, harm to ecological receptors and risk of health effects due to increased exposure to PM <sub>10</sub> and PM <sub>2.5</sub> . | High to Very Low depending on dust generating activity. | High to Low depending on sensitivity of human and ecological receptors. | Significant                                    | Tertiary (or good practice) dust mitigation measures to ensure minimal dust emissions, as described in the IAQM Construction Dust Guidance. | Scoped in                                      |
| Sensitive human and ecological receptors | Receptors may be subject to increased exposure to pollutant emissions from site plant and machinery.                                                                                                            | Low                                                     | High to Low depending on sensitivity of human and ecological receptors. | Not Significant                                | Tertiary (or good practice) mitigation measures to ensure minimal pollutant emissions, as described in the IAQM Construction Dust Guidance. | Scoped in (subject to further project details) |
| Sensitive human and                      | Receptors may be subject to increased exposure to                                                                                                                                                               | Low                                                     | High                                                                    | Not Significant (human) to                     | Unlikely to be needed for                                                                                                                   | Scoped in (subject to                          |

| Receptor             | Effects                                                | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage         | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                   | Scoped in/ Scoped out    |
|----------------------|--------------------------------------------------------|-----------------------|-------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| ecological receptors | pollutant emissions from construction-related traffic. |                       |                                     | potentially significant (designated ecological sites). | human receptors. Vehicle emissions will meet low vehicle emission standards for NOx and PM, where practicable. The use of electric or hydrogen fuel may also be considered. Any potential significant effects on designated ecological sites will be determined by the project ecologists, including any for mitigation measures required to be implemented. | further project details) |

| Receptor                                 | Effects                                                                                                 | Anticipated Magnitude | Anticipated Importance/ Sensitivity                      | Likely Significance of Effect at Scoping Stage                                    | Likely Mitigation Measures                                                                                                                                                                            | Scoped in/ Scoped out                          |
|------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Sensitive human receptors                | Receptors may be subject to annoyance from odour generated from construction activities.                | Low                   | High to Low depending on sensitivity of human receptors. | Not Significant                                                                   | Tertiary (or good practice) odour mitigation measures to ensure minimal odour emissions during earthworks or construction activities.                                                                 | Scoped in (subject to further project details) |
| <b>Operational Phase</b>                 |                                                                                                         |                       |                                                          |                                                                                   |                                                                                                                                                                                                       |                                                |
| Sensitive human and ecological receptors | Receptors may be subject to increased exposure to pollutant emissions from operational-related traffic. | Low                   | High                                                     | Not Significant (human) to potentially significant (designated ecological sites). | Unlikely to be needed for human receptors. Vehicle emissions will meet low vehicle emission standards for NO <sub>x</sub> and PM, where practicable. The use of electric or hydrogen fuel may also be | Scoped in (subject to further project details) |



| Receptor                                 | Effects                                                                                               | Anticipated Magnitude | Anticipated Importance/ Sensitivity                                     | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                   | Scoped in/ Scoped out                          |
|------------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|                                          |                                                                                                       |                       |                                                                         |                                                | considered. Any potential significant effects on designated ecological sites will be determined by the project ecologists, including any for mitigation measures required to be implemented. |                                                |
| Sensitive human and ecological receptors | Receptors may be subject to increased exposure to pollutant emissions from required combustion plant. | Low                   | High to Low depending on sensitivity of human and ecological receptors. | Not Significant                                | Appropriate primary mitigation such as a suitable stack height for the back-up generator(s) to improve pollutant dispersion such that emissions will comply with the relevant emission limit | Scoped in (subject to further project details) |

| Receptor                                 | Effects                                                                                                                                                                                                                                       | Anticipated Magnitude                      | Anticipated Importance/ Sensitivity                                     | Likely Significance of Effect at Scoping Stage                                             | Likely Mitigation Measures                                                                                                                  | Scoped in/ Scoped out                          |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|                                          |                                                                                                                                                                                                                                               |                                            |                                                                         |                                                                                            | values and standards.                                                                                                                       |                                                |
| Sensitive human receptors                | Receptors may be subject to annoyance from odour generated from operational activities.                                                                                                                                                       | Low                                        | High to Low depending on sensitivity of human receptors.                | Not Significant                                                                            | Appropriate abatement practices such as odour containment and monitoring.                                                                   | Scoped in (subject to further project details) |
| <b>Decommissioning Phase</b>             |                                                                                                                                                                                                                                               |                                            |                                                                         |                                                                                            |                                                                                                                                             |                                                |
| Sensitive human and ecological receptors | For dust, receptors associated with decommissioning, receptors may be subject to annoyance due to dust soiling, harm to ecological receptors and risk of health effects due to increased exposure to PM <sub>10</sub> and PM <sub>2.5</sub> . | Low depending on dust generating activity. | High to Low depending on sensitivity of human and ecological receptors. | Significant (not significant with mitigation taken forward from construction implemented). | Tertiary (or good practice) dust mitigation measures to ensure minimal dust emissions, as described in the IAQM Construction Dust Guidance. | Scoped in (subject to further project details) |
| Sensitive human and ecological receptors | Receptors may be subject to increased exposure to pollutant emissions from decommissioning-related traffic.                                                                                                                                   | Low                                        | High                                                                    | Not Significant                                                                            | All vehicles should be zero emissions by the decommissioning phase, so no mitigation should be needed.                                      | Scoped in (subject to further project details) |

| Receptor                                 | Effects                                                                                              | Anticipated Magnitude | Anticipated Importance/ Sensitivity                                     | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                  | Scoped in/ Scoped out                          |
|------------------------------------------|------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Sensitive human and ecological receptors | Receptors may be subject to increased exposure to pollutant emissions from site plant and machinery. | Low                   | High to Low depending on sensitivity of human and ecological receptors. | Not Significant                                | Tertiary (or good practice) mitigation measures to ensure minimal pollutant emissions, as described in the IAQM Construction Dust Guidance. | Scoped in (subject to further project details) |
| Sensitive human receptors                | Receptors may be subject to annoyance from odour generated from decommissioning activities.          | Low                   | High to Low depending on sensitivity of human receptors.                | Not Significant                                | Appropriate abatement practices such as odour containment and monitoring. Unlikely to be needed.                                            | Scoped in (subject to further project details) |

## 16 Climate Change

### 16.1 Introduction

16.1.1 This chapter describes the proposed scope and methodology for the assessment of the likely significant effects resulting from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on climate change, and the likely significant effects on the Proposed Development resulting from climate change. The assessment will be presented within an Environmental Statement (‘ES’) submitted with the application for a Development Consent Order (‘DCO’). This chapter describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.

16.1.2 The EIA Scoping Area is illustrated on Figure 1-1. This chapter should be read in conjunction with the following chapters of the Scoping Report:

- Chapter 2 The Proposed Development.
- Chapter 3 EIA Methodology.
- Chapter 6 Terrestrial Biodiversity.
- Chapter 9 Water Environment.
- Chapter 10 Landscape and Visual.
- Chapter 13 Traffic and Access.
- Chapter 20 Agricultural Land and Soils.
- Chapter 21 Materials and Waste.

16.1.3 Regulation 5(2)(c) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires significant effects on climate to be considered, as appropriate, within the EIA process. In addition, Schedule 4 of these regulations requires likely significant effects resulting from ‘*the impact of the project on climate...and the vulnerability of the project to climate change*’ to be addressed within an ES.

16.1.4 The climate change assessment is comprised of two elements which are both presented within this chapter:

- The impact of the Proposed Development on climate change ('Greenhouse Gas ('GHG') Emissions Assessment').
- The impact of climate change on the Proposed Development ('Climate Change Risk Assessment' ('CCRA'), including in-combination climate impacts ('ICCI')).

16.1.5 The lead author of this climate change assessment has over eight years' experience of preparing climate change ES chapters, including for several DCO projects, and has relevant qualifications including being a Chartered Environmentalist and full member of the Institute of Sustainability and Environmental Professionals ('ISEP').

## 16.2 Study Area

16.2.1 Appendix 16.1 to this chapter sets out the relevant legislation, policy and guidance relevant to climate change. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

### GHG Emissions Assessment

16.2.2 As GHG impacts are global and cumulative with all other sources of emissions, and the one receptor is the global atmosphere, no specific geographical study area has been defined in which to consider impact. The study area for the sources of GHG emissions comprises (i) the land, infrastructure and activities that occur within the EIA Scoping Area; and (ii) activities outside of the EIA Scoping Area, such as the transport and production of construction materials.

- 16.2.3 Table 16-5 and Table 16-6 set out the proposed scope of assessment, including likely direct and indirect emissions during the Proposed Development's construction and operational phases.
- 16.2.4 Given that climate change is a global issue, an assessment of the Proposed Development's GHG emissions will be made at the 'national' scale, in line with ISEP's Assessing Greenhouse Gas Emissions and Evaluating their Significance (2026) [1] (the 'ISEP GHG Guidance') through assessing the significance of effects in the context of the appropriate UK Carbon Budgets [2] [3] [4] [5]. The UK Carbon Budgets are set under the Climate Change Act 2008 (as amended) [6], which enshrines the UK's 2050 net zero target into law. Contextualisation against sector and local emissions will also be considered where information can be appropriately sourced, such as indicative sector budgets set out in the Carbon Budget Delivery Plan [7].

## CCRA

- 16.2.5 The CCRA will utilise UK Climate Change Projections 2018 ('UKCP18') data provided by the UK Met Office [8] which publishes data covering 25km grid cells. The study area will comprise the 25km grid cells within which the EIA Scoping Area is located.
- 16.2.6 Assessments of ICCI will be based on study areas identified for each discipline topic scoped into the ES, alongside the climate projections identified above.

## 16.3 Consultation and Engagement

- 16.3.1 A virtual meeting was held in June 2026 with the following stakeholders on the proposed approach to the assessment of the Proposed Development's likely significant effects in relation to climate change:
- Suffolk County Council.
  - Mid Suffolk District Council.
  - South Norfolk District Council.
  - Great Yarmouth Borough Council.
  - Broads Authority.

- Natural England.
- Environment Agency ('EA').

## 16.4 Baseline Environment

16.4.1 A desk-based study has been undertaken to establish the existing and future baseline context for the EIA Scoping Area. The following data sources have been reviewed to establish the baseline conditions for the EIA Scoping Area:

- Met Office historic climate data [9] – to identify the historic trends of relevant climate factors for the geographic area of the EIA Scoping Area.
- Google Maps – to identify the GHG baseline of the Proposed Development.
- Local authority, regional and UK (national) territorial GHG inventory data [10].
- EA Flood Map for Planning [11] – to identify the Proposed Development's flood risk and its susceptibility to the effects of climate change.

## GHG Emissions Assessment

### National Baseline Emissions

- 16.4.2 This section establishes the existing GHG emissions at a national and regional level. GHG emissions do not have a local receptor as, once they are emitted, they are not limited to geographic boundaries.
- 16.4.3 From a national perspective, in 2024, UK total net territorial emissions were estimated to be 373 million tonnes carbon dioxide equivalent ('MtCO<sub>2</sub>e'), a decrease of 3% from 2023 mainly due to decreased gas and coal in the electricity supply and greater renewable energy generation [12]. UK territorial GHG emissions in 2024 were 53% lower than they were in 1990.
- 16.4.4 The Department for Energy Security and Net Zero ('DESNZ') sets out the territorial CO<sub>2</sub>e emission estimates from a number of sources for 2005-2024 which are the most up to date available figures for the UK, East of England, Suffolk and Norfolk. The CO<sub>2</sub>e emission estimates for 2024 are presented in Table 16-1 below.

Table 16-1: National, East of England Suffolk and Norfolk Territorial CO<sub>2</sub>e Estimates for 2024

| Sector                                 | UK Local Authority Total (Kilo Tonnes Carbon Dioxide Equivalent ('ktCO <sub>2</sub> e')) | East of England (ktCO <sub>2</sub> e) | Suffolk (ktCO <sub>2</sub> e) | Norfolk (ktCO <sub>2</sub> e) |
|----------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------|-------------------------------|
| Industry                               | 52,189.0                                                                                 | 2,683.7                               | 627.9                         | 419.1                         |
| Commercial                             | 27,506.1                                                                                 | 2,381.9                               | 240.1                         | 301.7                         |
| Public Sector                          | 10,649.8                                                                                 | 852.6                                 | 91.7                          | 135.3                         |
| Domestic                               | 78,060.7                                                                                 | 7,383.3                               | 899.7                         | 1,101.8                       |
| Transport                              | 112,999.4                                                                                | 12,337.1                              | 1,346.8                       | 1,710.9                       |
| Land Use, Land Use Change and Forestry | 266.4                                                                                    | 2,475.6                               | 133.1                         | 857.4                         |
| Agriculture                            | 48,167.3                                                                                 | 4,075.5                               | 680.7                         | 1,273.9                       |
| Waste Management                       | 21,434.0                                                                                 | 2,675.3                               | 245.7                         | 223.9                         |
| <b>Total</b>                           | <b>351,272.8</b>                                                                         | <b>34,864.9</b>                       | <b>4,265.6</b>                | <b>6,023.9</b>                |

- 16.4.5 The Climate Change Act 2008 (as amended) requires the government to set five-yearly carbon budgets, after taking advice from the Climate Change Committee ('CCC'). The budgets are fixed in advance and set five-year caps on the total GHG emissions allowed to ensure the UK meets its emissions reductions commitments.
- 16.4.6 The carbon budgets enable net increases in emissions to be managed within the carbon budgets by balancing with performance in other sectors. Governments can use policies to achieve the net reductions necessary to meet the carbon budgets whilst taking an economy-wide and national approach to securing overall emissions reductions, facilitating other objectives including economic growth and energy security.



16.4.7 Table 16-2 sets out the UK carbon budgets from 2008 to 2042. The first, second and third budgets were met, culminating in a 37% reduction below 1990 carbon emissions. The fourth, fifth, sixth and seventh Carbon Budgets are the next milestones on the UK's pathway to net zero. The sixth Carbon Budget, for the period 2033-37, is the first budget to consider the UK's 2050 net zero target. This pathway is in line with the UK's Nationally Determined Contributions ('NDCs') and therefore, on a trajectory that is consistent with the Paris Agreement.

Table 16-2: 2008-2042 UK Carbon Budget

| UK Budget                                 | Carbon Budget Level (MtCO <sub>2</sub> e) | Reduction below 1990 Levels | UK Emissions              |
|-------------------------------------------|-------------------------------------------|-----------------------------|---------------------------|
| 1 <sup>st</sup> Carbon Budget (2008-2012) | 3,018 MtCO <sub>2</sub> e                 | 25%                         | 2,982 MtCO <sub>2</sub> e |
| 2 <sup>nd</sup> Carbon Budget (2013-2017) | 2,782 MtCO <sub>2</sub> e                 | 31%                         | 2,398 MtCO <sub>2</sub> e |
| 3 <sup>rd</sup> Carbon Budget (2018-2022) | 2,544 MtCO <sub>2</sub> e                 | 37%                         | 2,152 MtCO <sub>2</sub> e |
| 4 <sup>th</sup> Carbon Budget (2023-2027) | 1,950 MtCO <sub>2</sub> e                 | 52%                         | Current Budget Period     |
| 5 <sup>th</sup> Carbon Budget (2028-2032) | 1,725 MtCO <sub>2</sub> e                 | 57% by 2030                 | Not Applicable            |
| 6 <sup>th</sup> Carbon Budget (2033-2037) | 965 MtCO <sub>2</sub> e                   | 78% by 2035                 | Not Applicable            |
| 7 <sup>th</sup> Carbon Budget (2038-2042) | 535 MtCO <sub>2</sub> e                   | 87% by 2040                 | Not Applicable            |

16.4.8 The UK Government has published the Carbon Budget Delivery Plan ('CBDP') which sets out detailed proposals to enable the delivery of the fourth, fifth and sixth Carbon Budgets. The CBDP provides indicative projections of sectoral based residual emissions, based on an adjusted version of the Government's Energy and Emissions Projections, which apply assumptions of future economic growth, fossil fuel prices, electricity generation costs, UK population growth and other key variables. Table 16-3

sets out the projected emissions for the industry sector, which is considered to be the most relevant to the Proposed Development.

Table 16-3: Industry Sector Residual Emissions Across Carbon Budgets (MtCO<sub>2</sub>e) from the Carbon Budget Delivery Plan

| Sector   | Current<br>(2023, per annum ('pa')) | 4 <sup>th</sup> Carbon<br>Budget 5-<br>year<br>(average pa) | 5 <sup>th</sup> Carbon<br>Budget 5-<br>year<br>(average<br>pa) | 6 <sup>th</sup> Carbon<br>Budget 5-<br>year<br>(average<br>pa) |
|----------|-------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|
| Industry | 67.6                                | 340 (68)                                                    | 207 (41)                                                       | 111 (22)                                                       |

### Local Emissions (the EIA Scoping Area)

- 16.4.9 There are currently expected to be GHG emissions associated with agricultural practices produced within the EIA Scoping Area. These include GHG emissions associated with equipment use, crop fertilisation, soil-based emissions from disturbing soils, livestock, and waste produced as a result of farming processes and other activities.
- 16.4.10 The presence of hedgerows, scrub, and woodland and any regenerative farming practices within the EIA Scoping Area may provide carbon sequestration.
- 16.4.11 Chapter 19 ground conditions sets out the geology types expected to be present within the EIA Scoping Area. While detailed geology information, including organic matter content, is not yet available, peat has been identified as a superficial layer within the EIA Scoping Area. Depending on its condition, peat may be sequestering carbon and acting as a carbon sink.

## CCRA

### UK Observations

- 16.4.12 Observed climate changes over the UK include:
- The most recent decade, 2016–2026, has been 0.51°C warmer than 1991–2020, and 1.33°C warmer than 1961–1990 [13].

- All the UK's top ten warmest years, in a series from 1884, have occurred since 2000; the most recent four years (2022, 2023, 2024, 2025) are all in the top five warmest years [14].
- 2025 included the following records [15]:
  - Warmest year and summer on record for the UK.
  - Sunniest year on record for the UK.
  - England had its driest spring for over 130 years with many areas in southern and central England in drought conditions during spring and summer.
- A new highest daily minimum temperature record was recorded during the July 2022 heatwave of 26.8°C.
- A new highest daily maximum temperature was recorded during the July 2022 heatwave, with a temperature of 40.3°C [16].
- Since the 1960s, there has been an increase in annual average rainfall over the UK. However, natural variations are also accounted for in the longer observational record.
- The most recent decade (2016-2025) has been on average 2% wetter than during 1991-2020 and 10% wetter than 1961-1990 for the UK overall. In 2023, there were four separate months which were in the top 10 wettest for their respective monthly series.
- There have been fewer occurrences of maximum gust speeds exceeding 40/50/60 knots for the latest two decades compared to the 1980s and 1990s. The UK annual mean wind speed from 1969 to 2023 shows a downtrend, consistent with global observations.
- Widespread and substantial snow events have occurred in 2021, 2018, 2013, 2010 and 2009, but their frequency and severity have generally declined since the 1960s.

### Local and Regional Observations

- 16.4.13 Historical climate averages during the period 1991-2020 for the two closest climate stations to the EIA Scoping Area (in Lowestoft, approximately 2km east of the EIA Scoping Area, at a coastal location and in Scole, approximately 2km north of the EIA Scoping Area, at an inland location), obtained from the Met Office website are provided in Table 16-4 below.

Table 16-4: Existing Climate at the Lowestoft and Scole Meteorological Stations for the Period 1991–2020 [17]

| Climate Variable                                           | Lowestoft                     | Scole                         | UK Average       |
|------------------------------------------------------------|-------------------------------|-------------------------------|------------------|
| Average annual maximum temperature (°C)                    | 13.85                         | 14.81                         | 12.79            |
| Warmest month on average and mean maximum temperature (°C) | August, 21.2                  | July, 22.78                   | July, 19.62      |
| Coldest month on average and mean minimum temperature (°C) | February, 2.43                | February, 1.46                | February, 1.13   |
| Average total annual rainfall (mm/year)                    | 639.95                        | 626.19                        | 1162.68          |
| Wettest month on average and average monthly rainfall (mm) | October, 68.84                | November, 78.24               | December, 127.16 |
| Driest month on average and average monthly rainfall (mm)  | April, 34.7                   | April, 37.90                  | May, 70.96       |
| Annual Days of rainfall $\geq$ 1mm                         | 116.51                        | No data                       | 159.08           |
| Mean annual wind Speed at 10m (knots)                      | 8.12 (East Anglia data only)  | 8.12 (East Anglia data only)  | 9.27             |
| Annual days of air frost                                   | 42.15 (East Anglia data only) | 42.15 (East Anglia data only) | 41.9             |

16.4.14 As shown in Table 16-4, the EIA Scoping Area receives less than 700mm of precipitation per year on average and the wider area of Eastern England includes some of the driest areas in the country [18].

16.4.15 In this Scoping Report, flood risk is set out in chapter 9 water environment and indicates that there are areas of Flood Zone 3 (greater than 1% (1 in 100) Annual Exceedance Probability ('AEP') risk of fluvial flooding or 0.5% (1 in 200) AEP risk of flooding from the sea) and Flood Zone 2 (between

0.1% (1 in 1,000) and 1% (1 in 100) AEP risk of fluvial flooding or 0.1% (1 in 100) to 0.5% (1 in 200) AEP risk of flooding from the sea) in the study area for flood risk set out in chapter 9 water environment.

16.4.16 The EA has defined that the area within which Essex and Suffolk Water operate, which applies to the EIA Scoping Area, is classified as under 'serious' water stress [19].

16.4.17 The East of England region has been subject to a number of severe weather warnings [20], including (but not limited to):

- Red warning of wind issued in February 2022: Storm Eunice caused significant disruption and dangerous conditions due to extremely strong winds.
- Amber warnings of extreme heat in June 2026.
- Amber warnings of rain and wind during the winter seasons of 2016-2025.
- Amber warnings of snow and ice in 2021 and 2017-2018.
- Amber warning for extreme heat in July 2022.

16.4.18 Future climate projections suggest that the UK and the East of England region can be expected to experience hotter, drier summers and warmer, wetter winters with increasing frequency and intensity of extreme weather [21].

16.4.19 Key climate drivers and physical risks likely to impact sensitive receptors across the Proposed Development include:

- Long term changes to climatic norms.
- Low rainfall and drought.
- Heatwaves.
- Extreme precipitation and flooding.
- Storms (high winds).
- Sea level rise.

## 16.5 Likely Significant Effects

### GHG Emissions Assessment

- 16.5.1 The ISEP GHG Guidance identifies that all new GHG emissions contribute to a negative environmental impact and contribute to climate change, thus might be considered significant. All GHG emissions attributable to the Proposed Development are therefore proposed to be scoped into the ES.
- 16.5.2 The Greenhouse Gas Protocol [22] (the 'GHG Protocol') categorises direct and indirect emissions into three broad scopes which have been used to identify the likely significant effects of the Proposed Development:
- Scope 1: all direct GHG emissions.
  - Scope 2: indirect GHG emissions from the generation of purchased electricity, heat or steam.
  - Scope 3: other indirect emissions, such as the extraction and production of purchased materials and fuels, electricity-related activities not covered in Scope 2, outsourced activities, waste disposal etc.
- 16.5.3 Scope 1, 2 and 3 emissions from the Proposed Development are proposed to be scoped into the ES.
- 16.5.4 In addition, the British Standards Institution's Publicly Available Standard ('PAS') 2080 (2023) [23] defines lifecycle stages which are set out in Table 16-5 and Table 16-6 below. These are stages within a project's lifecycle for which emissions will be considered.

### Construction Phase

- 16.5.5 The scope of the GHG emissions assessment during the Proposed Development's construction phase using the GHG Protocol and PAS 2080 lifecycle stages is set out in Table 16-5.

Table 16-5: GHG Emissions Sources and Assessment Scope (PAS 2080) during the Construction Phase

| PAS 2080 Lifecycle Stages              | Emissions and Activities with Potential for Likely Significant Effects                                                                                                                     | Emission Scope      |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Construction Phase</b>              |                                                                                                                                                                                            |                     |
| A1 - A3 Product Stages                 | Embodied carbon from purchased materials required to construct the Proposed Development.                                                                                                   | Scope 3             |
| A4 Transport to Works Site             | Transport of construction materials and plant to the EIA Scoping Area. Construction staff commuting to the EIA Scoping Area.                                                               | Scope 1 and Scope 3 |
| A5 Construction – Installation Process | Construction process emissions resulting from the combustion of fuels in the Applicant's owned/controlled vehicles, plant, or equipment used for construction of the Proposed Development. | Scope 1             |
|                                        | Emissions associated with electricity from off-site generation needed for plant and welfare facilities that come from a mains connection during construction.                              | Scope 2             |
|                                        | Emissions from waste processing, water supply and treatment.                                                                                                                               | Scope 3             |
|                                        | Land use change, earthworks and soil disturbance.                                                                                                                                          | Scope 1             |

### Operational Phase

16.5.6 The scope of the GHG emissions assessment during the operational phase using the GHG Protocol and PAS 2080 lifecycle stages is set out in Table .

Table 16-6: GHG Emissions Sources and Assessment Scope (PAS 2080) during the Operational Phase

| PAS 2080 Lifecycle Stages    | Emissions and Activities with Potential for Likely Significant Effects                                                                                                                                       | Emission Scope      |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Operational Phase</b>     |                                                                                                                                                                                                              |                     |
| B1 Use                       | Emissions from on-site fuel generators, Applicant owned vehicles, carbon sequestration associated with landscaping and green infrastructure, purchase and use of chemicals, waste generation and processing. | Scope 1 and Scope 3 |
| B2 - B5 Maintenance, Repair, | Transport emissions, purchased materials, waste and on-site fuel use required for maintenance of on-site infrastructure.                                                                                     | Scope 1 and Scope 3 |

| PAS 2080 Lifecycle Stages  | Emissions and Activities with Potential for Likely Significant Effects                                                                                                                                                                                                                                       | Emission Scope |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Replacement, Refurbishment |                                                                                                                                                                                                                                                                                                              |                |
| B6 Operational Energy Use  | Emissions associated with purchased electricity from the National Grid and distribution network during operation of the Proposed Development.                                                                                                                                                                | Scope 2        |
| B7 Operational Water Use   | Emissions associated with clean water supply for use and treatment of wastewater. This relates to sourcing supply from off-site facilities only, if required for on-site activities such as welfare facilities. Emissions associated with on-site process of water treatment is captured under B1 Use above. | Scope 3        |

- 16.5.7 As set out in Section 16.6, an assessment of the Proposed Development's GHG emissions during the decommissioning phase, as well as in-combination assessment of the GHG emissions, has been proposed to be scoped out of the GHG emissions assessment.

## CCRA

### Construction Phase

- 16.5.8 The construction phase of the Proposed Development may be vulnerable to climate risks such as heatwaves and flooding events. Receptors such as construction workers at the EIA Scoping Area, temporary construction compounds and EIA Scoping Area access are considered to be the main receptors to these risks, some of which will be more susceptible to climate change than others depending on a range of factors, such as age and underlying health conditions. These effects have the potential to be significant and are therefore proposed to be scoped into the ES.

### Operational Phase

- 16.5.9 During operation, the Proposed Development may be vulnerable to climate risks such as flooding, drought and increasing temperatures. Routine maintenance workers at the Proposed Development's infrastructure and landscaping/planting are considered to be key receptors to climate risks and



will be assessed in the ES. These effects have the potential to be significant and are therefore proposed to be scoped into the ES.

- 16.5.10 Due to the potential for changes to the existing hydrological regime of watercourses during the operational phase of the Proposed Development, effects resulting from these changes, alongside future climate projections, have the potential to be significant and are therefore proposed to be scoped into the ES.

### **In-combination Climate Impacts**

- 16.5.11 There is the potential for ICCIs to be identified in other topics scoped into the ES when considered against the future climate change conditions. For example, if the assessment of the likely significant effects on terrestrial biodiversity identifies an effect on a habitat or species receptor due to the Proposed Development, such as loss of habitat, and in addition, projected future higher temperatures will increase the vulnerability of this habitat to fragmentation, this would be an ICCI. ICCIs will be assessed within each topic chapter scoped into the ES.

## **16.6 Impacts Scoped Out of the Assessment**

- 16.6.1 Indirect scope 3 emissions that will be assessed within the ES are set out in Table 16-5 and Table above. However, there is the potential for further indirect downstream emissions as a result of the Proposed Development enabling the lifting of the existing moratorium on the provision of new non-domestic water supply in the vicinity of the EIA Scoping Area. This could subsequently lead to new commercial development being built and occupied which would generate new GHG emissions associated with the construction and operation of those developments, enabled by the water supply provided by the Proposed Development. There is also the potential for further indirect emissions as a result of the Proposed Development enabling other development, such as residential, to be built and occupied.
- 16.6.2 These potential emissions from enabled development are proposed to be scoped out of the ES on the basis that the water produced by the Proposed

Development has a multiplicity of uses meaning that there is no certainty as to the nature of such enabled development and any resulting emissions. Any assessment of these indirect emissions would necessarily be speculative, given there is no available information on the quantum, design and location of any potential new development that would be enabled directly by the water supply to be provided by the Proposed Development.

- 16.6.3 Applying the principles set out in (R (Finch) v Surrey County Council and others [2024] UKSC 20; WLR(D) 275 [24]), it is not considered that there is sufficient causal connection between the Proposed Development and the emissions that may result from any enabled development, nor that there is sufficient certainty about the nature of such enabled developments for emissions to be meaningfully assessed. The effects of these enabled development indirect emissions are therefore proposed to be scoped out of the assessment in the ES.
- 16.6.4 Decommissioning of the Proposed Development is proposed to be scoped out of the assessment in the ES for both GHG emissions and CCRA. Given the long design life of the Proposed Development, which is assumed to be a minimum of 80 years, the emissions and climate vulnerability impacts associated with end-of-life stages are considered to be highly uncertain at this stage. Decommissioning activities are anticipated to occur after 2100, where technology and methodologies for decommissioning are not yet known. This is after the 2050 net zero legally binding target for the UK. Therefore, it can be reasonably assumed that the Proposed Development will be compliant with future regulations and best practice standards decommissioning activities that consider a net zero economy. This could be in the form of the use of alternatives to fossil fuels, utilising forms of low-carbon technology and transportation.
- 16.6.5 The Proposed Development will incorporate Circular Design Principles to improve resource efficiency and design out waste. The latter is of particular relevance to reducing waste during the decommissioning phase, and as a

result, GHG emissions. Further information on Circular Design Principles is set out in chapter 21 materials and waste.

- 16.6.6 Furthermore, some infrastructure is expected to remain in situ (such as underground pipework). Therefore, there would be no emissions associated with decommissioning these elements of the Proposed Development.
- 16.6.7 As such, significant effects from the decommissioning phase of the Proposed Development are not anticipated and the decommissioning phase is proposed to be scoped out of the assessment for GHG emissions and CCRA in the ES.
- 16.6.8 There are no anticipated in-combination effects resulting from the Proposed Development in relation to GHGs, as no other ES topic chapter assesses the global atmosphere as a sensitive receptor. Given that there are no common receptors between the GHG assessment and other ES topics, in-combination effects in relation to GHG emissions are proposed to be scoped out of the assessment in the ES.
- 16.6.9 There are no cumulative or inter-project climate vulnerability and resilience effects between the Proposed Development and other approved/existing developments in the surrounding area, as the identified potential effects and mitigation measures are specific to the Proposed Development. It is therefore proposed to be scoped out of the assessment in the ES.

## 16.7 Proposed Approach to Mitigation

### Primary (Inherent) Mitigation - GHG emissions

- 16.7.1 ISEP's GHG Management Hierarchy [25] recommends that GHG emissions are best mitigated by applying the following hierarchy:
- Eliminate: cease emission generating activity. Evaluate the basic need for the proposed project and explore alternative approaches to achieve the desired outcome/s.
  - Reduce: achieve absolute reductions in GHG emissions. Efficiency in operations and processes, energy, waste and fleet management. Build less and re-use or refurbish existing assets.

- Substitute: reduce GHG emissions intensity of energy use and of energy purchased. Adopt renewables and lower carbon materials and technologies.
- Remove: prioritise eliminate, reduce, substitute within the value chain. Adopt off-site or on-site means to offset and/or sequester GHG emissions, prioritising removal opportunities within organisational control with low risk of reversal.

16.7.2 The above hierarchy will be applied to the Proposed Development to identify appropriate mitigation to reduce GHG emissions, wherever possible. The majority of these measures are anticipated to be embedded into the design of the Proposed Development as primary mitigation measures. These will be set out in the ES.

### Primary (Inherent) Mitigation - CCRA

16.7.3 Climate resilience measures will typically result from design standards to reduce the risk of infrastructure being damaged, for example, designing for thermal shock to reduce stress or cracking of materials and components. These may be a combination of primary and tertiary mitigation measures. Potential mitigation measures relating to flood risk are set out in chapter 9 water environment.

### Secondary (Foreseeable) Mitigation

16.7.4 The requirement for secondary mitigation will be identified following the assessment of likely significant effects within the ES.

16.7.5 The production of a Construction Environmental Management Plan ('CEMP') in accordance with the Outline Construction Environmental Management Plan ('OCEMP') and a Decommissioning Environmental Management Plan ('DEMP') in accordance with the Outline Decommissioning Environmental Management Plan ('ODEMP') to be submitted with the DCO application, will help minimise environmental effects during the Proposed Development's construction and decommissioning phases by including measures such as limiting construction traffic, reducing engine idling and health and safety practices that must be adhered to during climate hazard events.

- 16.7.6 The production of a Carbon Management Plan ('CMP') in accordance with the Outline Carbon Management Plan ('OCMP') to be submitted with the DCO application, will provide a structured framework for managing and reducing greenhouse gas emissions throughout the construction, operational and decommissioning phases of the Proposed Development.

### **Tertiary (Inexorable) Mitigation**

- 16.7.7 Tertiary mitigation will include adherence to design standards that will be a requirement of the Proposed Development. Further information will be set out in the ES on standards of relevance to carbon and climate change for the Proposed Development.

## **16.8 Proposed Approach to the ES**

### **GHG Emissions**

#### **Best Practice Guidance**

- 16.8.1 The assessment methodology in the ES will draw upon the following industry guidance and standards:
- The ISEP GHG Guidance.
  - The GHG Protocol.
  - PAS 2080.
  - UK Water Industry Research's Calculating whole life/TOTEX Carbon [26].
  - UK Water Industry Research's A Framework for Accounting for Embodied Carbon in Water Industry Assets [27].
  - Royal Institution of Chartered Surveyors' Whole Life Carbon Assessment for the Built Environment [28].

#### **Assessment Methodology**

- 16.8.2 The metric for assessing the Proposed Development's carbon emissions is units of CO<sub>2</sub> equivalent ('CO<sub>2</sub>e'). This allows the use of the Global Warming Potential ('GWP') for the emissions of seven key GHGs, including carbon and methane, to be expressed in terms of their equivalent GWP as a mass of CO<sub>2</sub>e.

- 16.8.3 The GHG emissions for the Proposed Development will be calculated by multiplying activity data, such as quantity of concrete to be used in construction, by the relevant carbon factor. The equation is as follows:

*Activity data x carbon emissions factor = carbon emissions*

- 16.8.4 Carbon factors will be sourced from the latest recognised industry databases, such as the Government's greenhouse gas reporting conversion factors [29]. Activity data will be based on information available on the Proposed Development at the time of the preparation of the ES. Where information is not available, a qualitative assessment will be undertaken instead and assumptions stated.

### Sensitivity of Receptors

- 16.8.5 GHG emissions have a global effect rather than directly affecting specific local receptors to which levels of sensitivity can be assigned. The global climate will therefore be treated as a single receptor. Given the global scale and severe consequences of climate change and limited recoverability, the receptor sensitivity is considered to be high.

### Impact Magnitude

- 16.8.6 The UK has set a legally binding GHG reduction target for 2050 which, according to the CCC, is compatible with the magnitude and rate of GHG emission reductions required in the UK to meet the goals of the Paris Agreement. Given this, the ISEP GHG Guidance states that:

*'The crux of significance therefore is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero.'*

- 16.8.7 As a result, the ISEP GHG Guidance does not set out impact magnitude criteria, and significant effects are identified by the definitions in Table 16-7 below.

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### Effect Significance

- 16.8.8 There is currently no industry-wide agreed threshold of carbon emissions which, if exceeded, can be defined as significant or potentially significant. The ISEP GHG Guidance acknowledges that emissions of any scale contribute cumulatively to global climate change, the consequences of which has potential to lead to significant effects.
- 16.8.9 It states that the significance of the impact of GHG emissions should be determined by considering whether a project contributes to reducing GHG emissions relative to a comparable baseline, consistent with a trajectory towards net zero by 2050. The trajectory towards net zero is mandated within the relevant carbon budget through which the specific activity falls.
- 16.8.10 Significance of effect is therefore determined using professional judgement as a ‘competent professional’, and consideration of the following elements will be applied to the assessment:
- Appraisal of the Proposed Development’s emissions in the context of national, local and sector emissions through establishing the current and future baseline. The net lifecycle GHG emissions of the Proposed Development will be contextualised against the UK Carbon Budgets (UK Government, 2011, 2016, 2021 and 2026), the indicative sector Carbon Budgets [30]. These budgets show a trajectory to net zero by 2050.
  - ISEP GHG Guidance.
  - How the Proposed Development has embedded design features to reduce GHG emissions and committed to identified opportunities for mitigation.
- 16.8.11 The assessment will apply the following significance criteria in Table 16-7 that is set out in the ISEP GHG Guidance.

Table 16-7: GHG Significance Criteria

| Significance                   | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very Large - Large Adverse     | The Proposed Development's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with very large - large adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.         |
| Moderate Adverse               | The Proposed Development's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.                             |
| Slight Adverse                 | The Proposed Development's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with slight adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.                                                                                                |
| Neutral                        | The Proposed Development's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with neutral effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions. |
| Slight - Very Large Beneficial | The Proposed Development's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with neutral effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions. |

16.8.12 Effects that are described as 'slight' or 'neutral' are determined to be 'not significant' and effects that are described as 'moderate' or 'large' or 'very



large' are determined to be 'significant'. All beneficial effects are determined to be 'significant' in terms of climate change.

### **Mitigation and Residual Effects**

- 16.8.13 The assessment of effects will account for primary and tertiary mitigation measures. Following this, any requirements for secondary mitigation will be identified and residual effects will be clearly reported.

### **In-combination and Cumulative Effects**

- 16.8.14 The ISEP GHG Guidance identifies that all global cumulative GHG sources are relevant to the effect on climate change. For this reason, the ISEP GHG Guidance recommends that effects of GHG emissions from specific cumulative projects should not be individually assessed, as there is no basis for selecting particular cumulative projects that have GHG emissions over others. By its nature, the contextualisation of GHG emissions to the national carbon targets incorporates cumulative contributions of other GHG sources which make up that context. Therefore, a separate cumulative assessment will not be undertaken for the GHG assessment.
- 16.8.15 As set out in paragraph 16.6.8, there are no anticipated in-combination effects resulting from the Proposed Development in relation to GHGs.

## **CCRA**

### **Best Practice Guidance**

- 16.8.16 The assessment will align with the methodology set out in ISEP's Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (2020) [31] (the 'ISEP CCRA Guidance') and will follow the categorisation of climate risks identified by the 'Fourth Climate Change Risk Assessment - Independent Assessment' [32] and the CCC [33].

### **Assessment Methodology**

- 16.8.17 The CCRA will draw upon and inform other reports submitted in support of the DCO application, such as the Flood Risk Assessment and Landscaping Strategy, as these set out the design principles that address and respond to

the anticipated uncertainties within the predicted future climate models. In addition, a summary of the sustainability and energy provisions included within the Proposed Development will be provided.

- 16.8.18 The CCRA will use the UKCP18 provided by the UK Met Office. UKCP18 uses Representative Concentration Pathways ('RCPs') to develop projections and consider factors such as economic activity, population growth and land use change, which will result in a different range of global mean temperature increases. RCP 8.5 represents the highest emissions scenario, and this is considered the most appropriate scenario for assessing the impact of climate change on the Proposed Development, to provide a '*cautious 'worst case'*' approach (in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) [34].
- 16.8.19 UKCP18 provides climate change projections up to 2100 in the UK. It is noted that the design life of the Proposed Development is anticipated to be a minimum of 80 years, taking operation beyond 2100 and into the 2120s. Although there are no available climate projections beyond 2100, it is considered that these projections allow for a '*cautious 'worst case'*' approach across the design life of the Proposed Development.
- 16.8.20 ISEP CCRA Guidance recommends that the climatic baseline should consider extremes in short-term weather events, such as heatwaves; long-term climatic variability, such as seasonal changes in precipitation; and average climate norms, such as ambient temperature.
- 16.8.21 A review of the following data will be undertaken:
- Average Summer Precipitation (% change).
  - Average Winter Precipitation (% change).
  - Average Annual Precipitation (% change).
  - Maximum Average Summer Temperature.
  - Minimum Average Winter Temperature.
  - Annual Mean Temperature.

## Sensitivity of Receptors

16.8.22 Receptors that may be affected by climate change have been identified with consideration of both extreme weather events and gradual climatic changes in the study area for the Proposed Development. The sensitivity of receptors to climate change effects is described in Table 16-8. In ascribing the sensitivity of receptors in relation to potential climate change effects, the susceptibility of the receptor (e.g. ability to be affected by a change) and the vulnerability of the receptor (e.g. potential exposure to a change) have been taken into account.

16.8.23 Receptors for the CCRA relate to the Proposed Development itself, including all assets, infrastructure and future users, as set out in Table 16-8.

Table 16-8: Receptor Sensitivity

| Receptor                                 | Sensitivity     | Justification                                                                                                                                                                                        |
|------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction Phase</b>                |                 |                                                                                                                                                                                                      |
| Construction workers                     | Moderate        | During the construction phase, it is anticipated that the risk of climate hazards (e.g. heatwaves or periods of heavy precipitation) may increase which could affect construction workers.           |
| Construction Equipment                   | Moderate        | Construction equipment is not directly dependent on climatic factors but could be affected by some changes to climate.                                                                               |
| Land Stability                           | Moderate        | Earthworks during construction may expose soil and leave it vulnerable to erosion.                                                                                                                   |
| <b>Operational Phase</b>                 |                 |                                                                                                                                                                                                      |
| Future users of the Proposed Development | Moderate - High | Some future users of the Proposed Development (e.g. maintenance staff) will be more susceptible to climate change than others, depending on a range of factors such as age and existing poor health. |
| Infrastructure                           | Moderate - High | Infrastructure may require more maintenance and repair as changes to climatic norms cause increased stress on, for example, below-ground pipelines. The sensitivity is classified                    |

| Receptor                       | Sensitivity     | Justification                                                                                                          |
|--------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------|
|                                |                 | as moderate to high as efficiently working infrastructure is fundamental to the operation of the Proposed Development. |
| Ecology, Landscaping, Planting | Moderate - High | The proposed habitats within the Proposed Development vary in susceptibility to climate change.                        |
| Watercourses                   | Moderate        | Watercourses are dependent on climatic factors but have some limited ability to withstand function and form.           |

### Impact Magnitude

16.8.24 The CCRA methodology does not apply magnitude in the typical method used for other ES topics. Instead, a risk-based analysis using a combination of likelihood and consequence will be utilised, as per the ISEP CCRA Guidance.

16.8.25 The following key terms and definitions relating to the CCRA will be used:

- Climate hazard – a weather or climate related event, which has the potential to do harm to environmental or community receptors or assets, for example, increased winter precipitation.
- Climate change impact – an impact from a climate hazard which affects the ability of the receptor or asset to maintain its function or purpose.
- Consequence – any effect on the receptor or asset resulting from the climate hazard having an impact.

16.8.26 The likelihood of a climate impact occurring is based on the likelihood of a climate hazard occurring combined with the vulnerability and sensitivity of the receptor. Following the identification of climate hazards, the consequences of climate impacts on the receptor will be assessed. This will be undertaken using professional judgement and in discussion with the project design team.

### Effect Significance

16.8.27 There is no nationally adopted method for assessing and determining significance of climate change impacts within EIA. The assessment

approach will therefore draw upon guidance from the ISEP CCRA Guidance and professional judgement as a competent professional. This includes the consideration of whether the effect is temporary or permanent.

- 16.8.28 The significance of the CCRA findings is determined as a function of the likelihood of a climate change impact occurring (in combination with the sensitivity of the receptor) and the consequence to the receptor if the impact occurs. Effects that are described as ‘minor’ or ‘negligible’ are determined to be ‘not significant’, and effects that are described as ‘moderate’ or ‘major’ are determined to be ‘significant’.

### Mitigation and Residual Effects

- 16.8.29 The assessment of effects will account for primary and tertiary mitigation measures. Following this, any requirements for secondary mitigation will be identified and residual effects will be clearly reported.

### In-combination Effects

- 16.8.30 There is potential for climate change in-combination effects due to common receptors that will be assessed by other disciplines within their respective ES chapters, including on-site workers and proposed planting and habitats.

### Limitations and Assumptions

- 16.8.31 There are inherent assumptions and limitations within GHG assessments. Industry guidance and carbon factor data highlighted within the above sections will be utilised to enable the best estimate of GHG emissions for the Proposed Development. The assessment will depend on the quality of the Proposed Development activity data available at the time of the assessment, which will require assumptions to be made due to the outline nature of the Proposed Development. Any assumptions will be made to generally reflect a ‘cautious ‘worst case’’ scenario.
- 16.8.32 Scientific evidence shows that the climate is changing. However, there are significant uncertainties in the magnitude, frequency and spatial occurrence within the climate projections utilised in this assessment. The UKCP18 are not predictions or forecasts but simulations of potential scenarios of future

climate under a range of hypothetical emissions scenarios and assumptions, and therefore cannot be treated as exact or factual, but projection options. The projections are dependent on future global GHG emissions and, while several different scenarios are provided, it cannot be reliably predicted which (if any) emission scenario will occur over the next 80 years.

- 16.8.33 Additionally, projections after the 2040s increasingly diverge between scenarios and provide greater confidence for long-term climate averages than extreme events. For example, there is greater confidence around changes in temperature than there is in relation to wind. Levels of confidence and certainty will be considered when assessing the likelihood and consequence of climate hazards.
- 16.8.34 The assessment of likely significant effects of the Proposed Development on climate change in the ES will use the latest information sources available at the time of writing. New climate information is published regularly as more in-depth analysis of climate changes is completed, which may later supersede the information used to inform the assessment.
- 16.8.35 Any changes to the existing hydrological regime of watercourses during the operational phase of the Proposed Development are not expected to result in likely significant carbon effects on sensitive receptors. These will however be considered further in the ES in relation to climate change risk effects, as noted in 16.5.10.

## 16.9 Summary of Impacts and Effects

- 16.9.1 Table 16-9 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the climate change chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 16-9: Summary of Climate Change Scope

| Receptor                                                                                                       | Effects                                              | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                    | Scoped in/Scoped out |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Construction Phase</b>                                                                                      |                                                      |                       |                                    |                                                |                                                                                                                                                                                               |                      |
| Global Atmosphere                                                                                              | Emit GHGs during construction.                       | N/A                   | High                               | Significant                                    | Carbon Reduction Hierarchy (eliminate, reduce, substitute, compensate).<br>Measures set out in a CEMP in accordance with the OCEMP.<br>Measures set out in a CMP in accordance with the OCMP. | Scoped in            |
| Climate vulnerable receptors – Proposed Development construction workers, infrastructure, landscaping/planting | Health and safety, delays to construction programme. | N/A                   | Medium                             | Significant                                    | Measures set out in a CEMP in accordance with the OCEMP.                                                                                                                                      | Scoped in            |

| Receptor                                                                                           | Effects                                                                     | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                              | Scoped in/Scoped out |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Operational Phase</b>                                                                           |                                                                             |                       |                                    |                                                |                                                                                                                                         |                      |
| Global Atmosphere                                                                                  | Emit GHGs during operation.                                                 | N/A                   | High                               | Significant                                    | Management of operational processes, use of electric vehicles, renewable energy. Measures set out in a CMP in accordance with the OCMP. | Scoped in            |
| Global Atmosphere                                                                                  | Enabled development indirect emissions.                                     | N/A                   | High                               | N/A                                            | N/A                                                                                                                                     | Scoped out           |
| Global Atmosphere                                                                                  | Enabled development indirect emissions.                                     | N/A                   | High                               | N/A                                            | N/A                                                                                                                                     | Scoped out           |
| Climate vulnerable receptors – Proposed Development operational workers (for routine maintenance), | Health and safety, damage to infrastructure and planting, loss of function. | N/A                   | Medium                             | Significant                                    | Design standards, maintenance, selection of native species.                                                                             | Scoped in            |



| Receptor                                                                                     | Effects                                                                                                                          | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                         | Scoped in/Scoped out |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------|
| infrastructure, landscaping/planting                                                         |                                                                                                                                  |                       |                                    |                                                |                                                                                                                    |                      |
| Watercourses                                                                                 | Potential change to existing hydrological regime alongside climate change may increase flood risk or cause environmental stress. | N/A                   | Medium                             | Significant                                    | Refer to chapter 9 water environment.                                                                              | Scoped in            |
| <b>Decommissioning Phase</b>                                                                 |                                                                                                                                  |                       |                                    |                                                |                                                                                                                    |                      |
| Global Atmosphere                                                                            | Emit GHGs during decommissioning                                                                                                 | N/A                   | High                               | Not Significant                                | Circular Design Principles.                                                                                        | Scoped out           |
| Climate vulnerable receptors – decommissioning workers, infrastructure, landscaping/planting | Health and safety, delays to decommissioning programme.                                                                          | N/A                   | Medium                             | Not Significant                                | Measures set out in a DEMP in accordance with the ODEMP.<br>Measures set out in a CMP in accordance with the OCMP. | Scoped out           |

## 17 Socio-economics

### 17.1 Introduction

17.1.1 This chapter describes the proposed approach that will be undertaken for the assessment of the likely significant effects arising from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on socio-economics (including tourism). The assessment will be presented within the Environmental Statement (‘ES’) submitted in support of the application for a Development Consent Order (‘DCO’). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.

17.1.2 The EIA Scoping Area is illustrated on Figure 1-1. This chapter should be read in conjunction with the following chapters of the Scoping Report:

- Chapter 2 The Proposed Development.
- Chapter 3 EIA Methodology.
- Chapter 10 Landscape and Visual.
- Chapter 13 Traffic and Access.
- Chapter 14 Noise and Vibration.
- Chapter 18 Human Health.
- Chapter 20 Agricultural Land and Soils.

17.1.3 The scope of the proposed socio-economic assessment is guided by section 4.13 of the National Policy Statement for Water Resources Infrastructure (‘NPSWRI’) (2023) [1] and the likely socio-economic impacts to be considered, which include:

- Job creation and training opportunities.
- Provision of visitor/educational facilities.
- The impact on tourism, local businesses or local services.

- Opportunities to provide a direct water supply to local business water users.
- 17.1.4 The socio-economic topic is therefore focused on assessing the economic impacts of the Proposed Development due to its nature. This includes consideration of jobs, employment, skills and the labour market, business enterprises (both land and maritime businesses), including tourism and recreational businesses, and the wider tourism economy. The socio-economic assessment does not consider the users of any such businesses. The social impacts on the population, including users of tourism or recreational facilities (including Public Rights of Way ('PRoW')) is considered within chapter 18 human health of this Scoping Report. The impact of the Proposed Development specifically on agricultural businesses is considered in chapter 20 agricultural land and soils of this Scoping Report rather than under the socio-economics topic.
- 17.1.5 The socio-economic impacts on tourism and businesses are attributed to visual, traffic, noise, and navigational effects which are considered in chapter 10 landscape and visual, chapter 13 traffic and access and chapter 14 noise and vibration, respectively, of this Scoping Report. The socio-economic assessment will reference findings from these other technical assessments scoped into the ES, where necessary.
- 17.1.6 The socio-economics chapter of the ES will be supported by an Outline Skills and Employment Plan ('OSEP') to be submitted in support of the DCO application that will set out a framework for embedding measures to maximise employment and upskilling opportunities for the local area.
- 17.1.7 The lead assessor for the socio-economics chapter of the ES holds a BA (Hons) in Geography and MA in Town Planning and has over 20 years of professional experience in the field of socio-economic research in both the public and private sector, specialising in social and economic impact assessment. They have prepared socio-economic assessments in support of other major infrastructure projects consented under the Planning Act

2008 and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [2].

## 17.2 Study Area

- 17.2.1 Socio-economic impacts and effects can occur and be experienced in different ways at different spatial levels, and their significance can vary between areas. For this reason, multiple study areas are proposed for the assessment of the likely significant socio-economic effects resulting from the Proposed Development to represent a range of spatial levels from the local to regional level. For example, impacts and effects on tourism and business enterprises will be more localised to the Order Limits, whereas effects on jobs, employment and skills have the potential to impact a wider area.
- 17.2.2 Professional judgement has been used to select the appropriate socio-economic study areas which are considered to retain relevance and proportionality to the assessment encompassing the scale and nature of the Proposed Development's construction/decommissioning and operational activities:
- Hyper local - 500m radius from the EIA Scoping Area. This has been broken down into the following sections of the EIA Scoping Area based on the following components of the Proposed Development (refer to chapter 2 the Proposed Development and Figure 1-3):
    - Proposed Advanced Water Recycling Plant ('AWRP').
    - Proposed Long Sea Outfall ('LSO').
    - Proposed Central Service Reservoir ('CSR').
    - Proposed Western Service Reservoir ('WSR').
    - Proposed AWRP to River Waveney Pipeline.
    - Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
    - Proposed CSR to WSR Pipeline.
    - Proposed CSR to Saxmundham Pipeline.

- 
- Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline.
  - Proposed Eastern Distribution Mains.
  - Proposed Western Distribution Mains.
  - Local – Comprises the Middle-layer Super Output Areas ('MSOAs') which intersect within 2km of the EIA Scoping Area, named 'Local Study Area' throughout this chapter. These comprise:
    - Great Yarmouth 013.
    - South Norfolk 010.
    - Mid Suffolk 001.
    - Mid Suffolk 002.
    - Mid Suffolk 003.
    - Mid Suffolk 005.
    - East Suffolk 016.
    - East Suffolk 017.
    - East Suffolk 018.
    - East Suffolk 019.
    - East Suffolk 001.
    - East Suffolk 010.
    - East Suffolk 011.
    - East Suffolk 013.
    - East Suffolk 015.
  - Local Planning Authority ('LPA') administrative areas within which the Proposed Development is located, referred to as 'LPA study area' throughout this chapter. The data provided is for the entire administrative area of the four LPAs, including for their administrative areas located outside of the EIA Scoping Area, as data specific to the EIA Scoping Area only is not available:
    - East Suffolk Council ('ESC').
    - Great Yarmouth Borough Council ('GYBC').
-

- 
- Mid Suffolk District Council ('MSDC').
  - South Norfolk District Council ('SNDC').
  - Counties – Suffolk and Norfolk.
  - Regional – East of England.
- 17.2.3 Baseline data for these study areas, along with comparator geographies (to benchmark sensitivity and contextualise magnitude), will be reported subject to data availability. Baseline conditions will be established through reference to published secondary data from the following sources:
- Office for National Statistics ('ONS') 2021 Census [3].
  - ONS, Mid-Year Population Estimates (2024) [4].
  - Ministry of Housing, Communities and Local Government ('MHCLG') English Indices of Deprivation 2025 [5].
  - ONS, Annual Population Survey ('APS') [6].
  - ONS, Business Register and Employment Survey ('BRES').
  - ONS, Business Counts [7].
  - Oxford Economics, Local Authority District Databank [8].
  - Landstack Land Information Platform (combining data from a number of companies including Ordnance Survey, Companies House and HM Land Registry) [9].
  - CoStar, Commercial Real Estate Data [10].
  - Visit Britain, Visitation Statistics [11].
  - Visit Britain, England Accommodation Stock Audit [12].
- 17.2.4 Appendix 17.1 to this chapter sets out the legislation, policy and guidance relevant to socio-economics which will be updated, where necessary, within the ES.
- ### 17.3 Consultation and Engagement
- 17.3.1 No topic-specific engagement and consultation in relation to socio-economic considerations has been undertaken to date. Consultation and engagement with the LPAs will be undertaken to inform the preparation of the OSEP.
-

17.4 Baseline Environment

17.4.1 This section sets out a baseline for the purposes of scoping to provide an understanding of the existing socio-economic, business and tourism conditions within the identified socio-economics study areas which may be impacted upon by the Proposed Development.

LPA Study Area Conditions

17.4.2 This section provides socio-economic baseline information for the LPA study area (comprising ESC, GYBC, MSDC, and SNDC), with comparator data for Suffolk, Norfolk, the East of England, and England.

Resident Population

17.4.3 It is estimated that the LPA study area has a total resident population of 611,400 people according to the 2024-Mid Year Population Estimates as demonstrated in Table . The age profile of the LPA study area is older than both the regional and national averages, with a lower proportion of working age people (aged 16 to 64 years) and a higher proportion of the total population aged 65+ years.

Table 17-1: Resident Population (2024)

|                             | Total Resident Population | % Aged 0 to 15 Years | % Aged 16 to 64 Years | % Aged 65+ Years |
|-----------------------------|---------------------------|----------------------|-----------------------|------------------|
| ESC                         | 249,700                   | 15%                  | 56%                   | 29%              |
| GYBC                        | 100,500                   | 17%                  | 58%                   | 25%              |
| MSDC                        | 110,800                   | 16%                  | 59%                   | 26%              |
| SNDC                        | 148,400                   | 17%                  | 58%                   | 25%              |
| <b>Total LPA study area</b> | <b>611,400</b>            | <b>16%</b>           | <b>57%</b>            | <b>27%</b>       |
| Norfolk                     | 940,400                   | 16%                  | 59%                   | 25%              |
| Suffolk                     | 786,200                   | 17%                  | 59%                   | 24%              |
| East of England             | 6,576,300                 | 19%                  | 61%                   | 20%              |

|         | Total Resident Population | % Aged 0 to 15 Years | % Aged 16 to 64 Years | % Aged 65+ Years |
|---------|---------------------------|----------------------|-----------------------|------------------|
| England | 58,620,100                | 18%                  | 63%                   | 19%              |

Source: ONS, Mid-Year Population Estimates (2024). Figures have been individually rounded to the nearest 100 and may not sum.

Deprivation

- 17.4.4 Table shows the national deprivation ranking of each of the LPAs in the LPA study area. The rank is out of 296 local authority districts in England with a rank of 1 indicating the most deprived.
- 17.4.5 SNDC is the least deprived LPA out of the four LPAs within the LPA study area, falling within England’s 70% to 80% least deprived authorities, followed by MSDC (within 60% to 70% least deprived). In contrast, GYBC is the most deprived, falling within England’s most deprived 10% of authorities. ESC is within England’s 40% to 50% most deprived authorities.

Table 17-2: Deprivation Ranking (2025)

| LPA  | National Rank (out of 296) | National Deprivation Ranking     |
|------|----------------------------|----------------------------------|
| ESC  | 138                        | Within 40% to 50% most deprived  |
| GYBC | 25                         | Within most deprived 10%         |
| MSDC | 191                        | Within 60% to 70% least deprived |
| SNDC | 220                        | Within 70% to 80% least deprived |

Source: MHCLG, English Indices of Deprivation 2025

Employment and Unemployment

- 17.4.6 Table shows economic activity data for the LPA study area from the 2021 Census. The APS provides more up-to-date data; however, it does not include complete data coverage for all LPAs in the LPA study area. This data will be reviewed and provided in the socio-economics chapter of the ES, if available.



17.4.7 The data shows that in the LPA study area and Norfolk and Suffolk; there is a lower proportion of economically active and employed residents when compared to the regional and national averages. Within the LPA study area, GYBC and ESC have a lower proportion and MSDC and SNDC a higher proportion, of economically active and employed residents when compared to the national and regional averages.

Table 17-3: Economic Activity (2021)

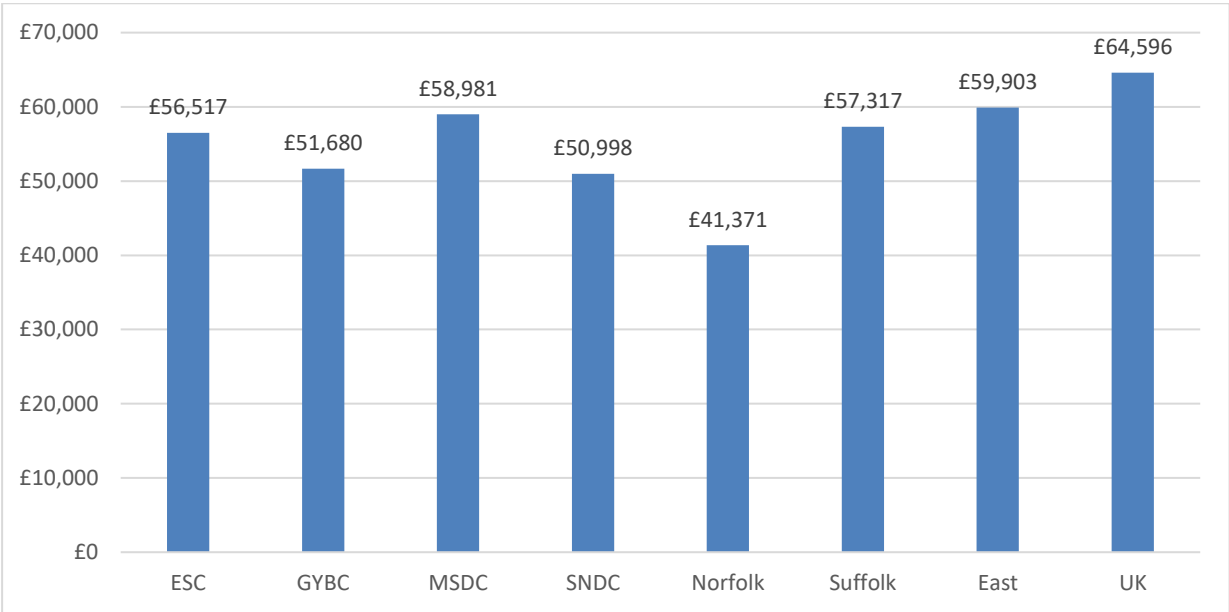
|                                 | Economically Active:<br>Employed | Economically Active:<br>Unemployed | Economically<br>Inactive |
|---------------------------------|----------------------------------|------------------------------------|--------------------------|
| ESC                             | 50.4%                            | 2.3%                               | 45.9%                    |
| GYBC                            | 48.7%                            | 3.6%                               | 46.2%                    |
| MSDC                            | 56.8%                            | 1.7%                               | 40.0%                    |
| SNDC                            | 56.7%                            | 1.7%                               | 40.2%                    |
| <b>Total LPA<br/>study area</b> | <b>52.7%</b>                     | <b>2.3%</b>                        | <b>43.6%</b>             |
| Norfolk                         | 52.6%                            | 2.3%                               | 43.3%                    |
| Suffolk                         | 55.2%                            | 2.3%                               | 40.9%                    |
| East of<br>England              | 57.3%                            | 2.5%                               | 38.2%                    |
| England                         | 55.7%                            | 2.9%                               | 39.1%                    |

Source: ONS, 2021 Census Table TS066

### Gross Value Added ('GVA')

17.4.8 GVA is an economic productivity metric that measures the contribution of a producer, industry or region to an economy. Figure 17-1 shows GVA per worker for each of the LPAs in the LPA study area, Suffolk, Norfolk, the East of England, and UK (data for England is not available). The data is sourced from Oxford Economics and presents the 5-year average (2019 – 2023, which is the latest available data).

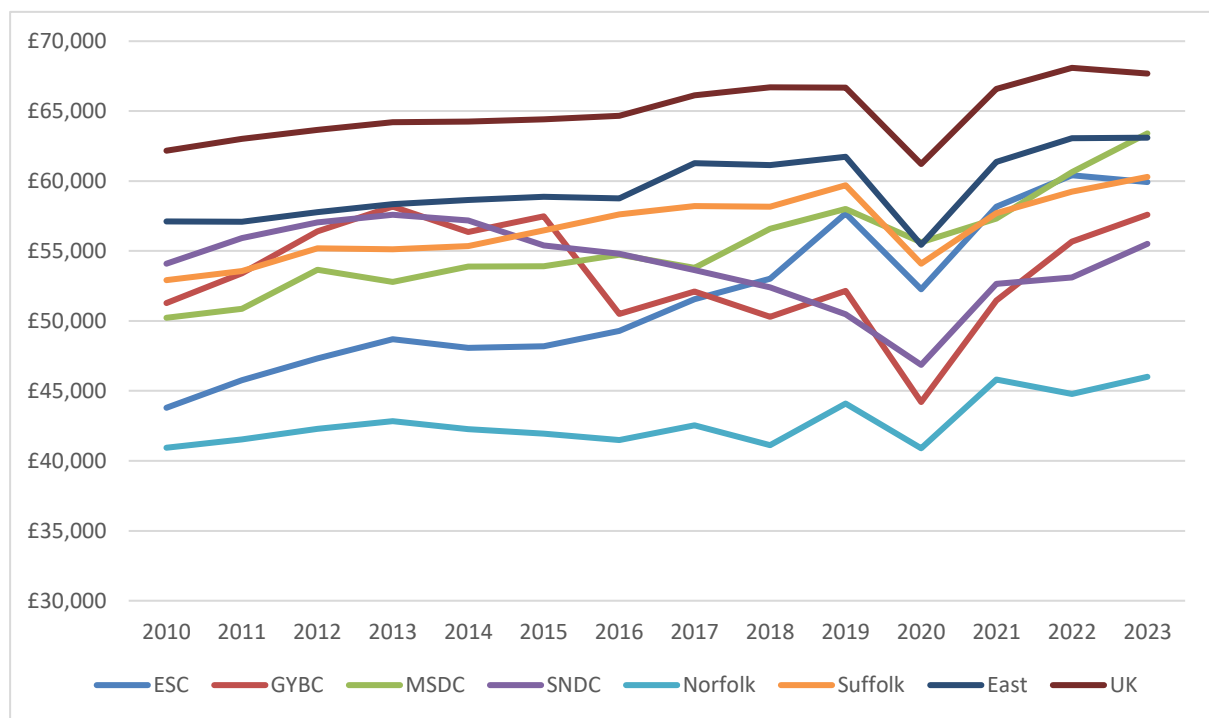
17.4.9 Average annual earnings are highest across the UK, followed by the East of England while Norfolk records the lowest earning; among the local authorities, MSDC has the highest earnings and SNDC has the lowest.



Source: Oxford Economics

Figure 17-1: GVA Per Worker (5-year Average, 2019-2023)

17.4.10 Figure 17-2 shows the change in annual GVA per worker overtime between 2010 and 2023. All areas saw a decrease in GVA per head between 2019 and 2020 reflecting the impact of the COVID-19 pandemic, followed by a recovery between 2020 and 2021. All areas returned to, or returned close to, pre-pandemic levels by 2021, with MSDC and ESC seeing significantly higher GVA per worker figures than pre-pandemic levels in 2021 compared to 2019.



Source: Oxford Economics

Figure 17-2: Change in GVA Per Worker Overtime, 2010 to 2023

### Business and Industry

- 17.4.11 Table 17-4 shows business counts by industrial sector as a proportion of total business counts. There are estimated to be 22,890 businesses within the LPA study area, accounting for 35% of all businesses within Suffolk and Norfolk combined.
- 17.4.12 The LPA study area has more agriculture, forestry and fishing businesses when compared to the regional and national averages, but comparable to the Norfolk and Suffolk averages. Similarly, the LPA study area also has a higher proportion of accommodation and food services businesses compared to the regional and national averages.

Table 17-4: Business Count by Sector (2025)

| Industry                               | ESC | GYBC | MSDC | SNDC | Total LPA study area | Norfolk | Suffolk | East of England | England |
|----------------------------------------|-----|------|------|------|----------------------|---------|---------|-----------------|---------|
| Agriculture, forestry & fishing        | 8%  | 4%   | 13%  | 11%  | 9%                   | 9%      | 8%      | 4%              | 4%      |
| Mining, quarrying & utilities          | 0%  | 1%   | 0%   | 1%   | <b>1%</b>            | 1%      | 0%      | 1%              | 1%      |
| Manufacturing                          | 5%  | 6%   | 6%   | 6%   | <b>5%</b>            | 6%      | 5%      | 5%              | 5%      |
| Construction                           | 15% | 15%  | 17%  | 15%  | <b>15%</b>           | 16%     | 15%     | 18%             | 14%     |
| Motor trades                           | 3%  | 4%   | 4%   | 4%   | <b>4%</b>            | 4%      | 4%      | 3%              | 3%      |
| Wholesale                              | 3%  | 3%   | 3%   | 3%   | <b>3%</b>            | 3%      | 3%      | 4%              | 4%      |
| Retail                                 | 8%  | 10%  | 5%   | 6%   | <b>7%</b>            | 8%      | 7%      | 7%              | 8%      |
| Transport & storage (including postal) | 7%  | 5%   | 4%   | 4%   | <b>5%</b>            | 4%      | 6%      | 5%              | 4%      |
| Accommodation & food services          | 8%  | 13%  | 4%   | 5%   | <b>7%</b>            | 8%      | 6%      | 5%              | 6%      |
| Information & communication            | 4%  | 2%   | 4%   | 5%   | <b>4%</b>            | 4%      | 5%      | 6%              | 7%      |
| Financial & insurance                  | 2%  | 2%   | 2%   | 2%   | <b>2%</b>            | 2%      | 2%      | 2%              | 2%      |
| Property                               | 4%  | 4%   | 3%   | 4%   | <b>4%</b>            | 4%      | 4%      | 4%              | 5%      |
| Professional, scientific & technical   | 13% | 12%  | 13%  | 14%  | <b>13%</b>           | 13%     | 13%     | 15%             | 16%     |

| Industry                                         | ESC          | GYBC         | MSDC         | SNDC         | Total LPA study area | Norfolk       | Suffolk       | East of England | England          |
|--------------------------------------------------|--------------|--------------|--------------|--------------|----------------------|---------------|---------------|-----------------|------------------|
| Business administration & support services       | 7%           | 8%           | 9%           | 7%           | <b>8%</b>            | 7%            | 8%            | 8%              | 8%               |
| Public administration & defence                  | 1%           | 1%           | 2%           | 2%           | <b>1%</b>            | 1%            | 1%            | 1%              | 0%               |
| Education                                        | 2%           | 1%           | 2%           | 2%           | <b>2%</b>            | 2%            | 2%            | 2%              | 2%               |
| Health                                           | 3%           | 4%           | 3%           | 5%           | <b>4%</b>            | 4%            | 4%            | 4%              | 4%               |
| Arts, entertainment, recreation & other services | 7%           | 7%           | 6%           | 5%           | <b>6%</b>            | 6%            | 7%            | 7%              | 7%               |
| <b>Total</b>                                     | <b>9,295</b> | <b>2,770</b> | <b>4,955</b> | <b>5,870</b> | <b>22,890</b>        | <b>33,665</b> | <b>30,970</b> | <b>271,475</b>  | <b>2,376,615</b> |

Source: ONS, Business Counts 2025

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### Employment by Industry (workplace-based)

- 17.4.13 Data from the BRES gives us information on workplace-based employment by industrial sector. Table shows the percentage of employment in each of the socio-economic study areas by industry. Like the business count data, the data shows that a higher proportion of employment in the LPA study area, Norfolk and Suffolk is within the agriculture, forestry and fishing sector than compared to the regional and national averages. MSDC particularly has a high proportion of employment in this sector (6%).
- 17.4.14 Other sectors representing a higher proportion of employment in the LPA study area than in comparison to the regional and national averages comprise: mining, quarrying and utilities; manufacturing; construction; retail; accommodation and food services; and health.

Table 17-5: Workplace-based Employment (2024)

| Industry                                  | ESC | GYBC | MSDC | SNDC | Total LPA<br>Study Area | Norfolk | Suffolk | East of<br>England | England |
|-------------------------------------------|-----|------|------|------|-------------------------|---------|---------|--------------------|---------|
| Agriculture, forestry & fishing           | 3%  | 1%   | 6%   | 4%   | <b>3%</b>               | 4%      | 3%      | 1%                 | 1%      |
| Mining, quarrying & utilities             | 2%  | 2%   | 1%   | 2%   | <b>2%</b>               | 1%      | 2%      | 1%                 | 1%      |
| Manufacturing                             | 10% | 7%   | 12%  | 8%   | <b>9%</b>               | 9%      | 9%      | 7%                 | 7%      |
| Construction                              | 6%  | 4%   | 12%  | 6%   | <b>7%</b>               | 6%      | 6%      | 7%                 | 5%      |
| Motor trades                              | 3%  | 2%   | 3%   | 2%   | <b>2%</b>               | 2%      | 3%      | 2%                 | 2%      |
| Wholesale                                 | 2%  | 3%   | 4%   | 3%   | <b>3%</b>               | 3%      | 3%      | 4%                 | 4%      |
| Retail                                    | 10% | 10%  | 6%   | 7%   | <b>9%</b>               | 10%     | 9%      | 8%                 | 8%      |
| Transport & storage<br>(including postal) | 10% | 3%   | 7%   | 2%   | <b>6%</b>               | 3%      | 7%      | 6%                 | 5%      |
| Accommodation & food<br>services          | 10% | 16%  | 6%   | 6%   | <b>9%</b>               | 9%      | 8%      | 7%                 | 8%      |
| Information & communication               | 4%  | 1%   | 2%   | 2%   | <b>3%</b>               | 2%      | 3%      | 3%                 | 5%      |

| Industry                                         | ESC           | GYBC          | MSDC          | SNDC          | Total LPA<br>Study Area | Norfolk        | Suffolk        | East of<br>England | England           |
|--------------------------------------------------|---------------|---------------|---------------|---------------|-------------------------|----------------|----------------|--------------------|-------------------|
| Financial & insurance                            | 1%            | 1%            | 0%            | 1%            | <b>1%</b>               | 3%             | 2%             | 2%                 | 3%                |
| Property                                         | 2%            | 1%            | 1%            | 2%            | <b>2%</b>               | 2%             | 2%             | 2%                 | 2%                |
| Professional, scientific & technical             | 5%            | 5%            | 6%            | 6%            | <b>6%</b>               | 6%             | 5%             | 9%                 | 10%               |
| Business administration & support services       | 5%            | 6%            | 9%            | 6%            | <b>6%</b>               | 7%             | 11%            | 12%                | 9%                |
| Public administration & defence                  | 5%            | 2%            | 2%            | 4%            | <b>4%</b>               | 5%             | 4%             | 4%                 | 4%                |
| Education                                        | 8%            | 8%            | 7%            | 7%            | <b>8%</b>               | 8%             | 8%             | 9%                 | 8%                |
| Health                                           | 10%           | 23%           | 9%            | 28%           | <b>17%</b>              | 16%            | 12%            | 12%                | 13%               |
| Arts, entertainment, recreation & other services | 5%            | 5%            | 4%            | 3%            | <b>4%</b>               | 4%             | 5%             | 4%                 | 4%                |
| <b>Total employment</b>                          | <b>98,450</b> | <b>38,350</b> | <b>40,050</b> | <b>61,750</b> | <b>238,600</b>          | <b>391,500</b> | <b>352,000</b> | <b>2,987,000</b>   | <b>28,415,000</b> |

Source: ONS, BRES 2024



## Tourism

- 17.4.15 Table 17-6 shows tourism indicators for each of the LPAs in the LPA study area, Suffolk and Norfolk using data from Visit Britain.
- 17.4.16 On average, there are more tourism trips to Norfolk than Suffolk. Day tourism brings in the most spend for Norfolk (£757m per annum) while overnight visitors bring in the most spend for Suffolk (£354m per annum).
- 17.4.17 Of the four LPAs in the LPA study area, GYBC receives the most tourism trips across all types of tourism (day tourism, overnight visitors and holidays). Day tourism brings in the most spend in each of the LPAs.

Table 17-6: Tourism Indicators (annual average)

| Tourism Indicators                            | Day Tourism         |            | Overnight Visitors  |            | Holidays            |            |
|-----------------------------------------------|---------------------|------------|---------------------|------------|---------------------|------------|
|                                               | Number of Trips (m) | Spend (£m) | Number of Trips (m) | Spend (£m) | Number of Trips (m) | Spend (£m) |
| ESC (formerly Suffolk Coastal) (2017 to 2019) | 4.76                | 80         | 0.33                | 62         | 0.17                | 43         |
| GYBC (2017 to 2019)                           | 5.21                | 153        | 0.55                | 129        | 0.46                | 116        |
| MSDC (2017 to 2019)                           | 2.57                | 109        | 0.10                | 10         | 0.05                | 5          |
| SNDC (2017 to 2019)                           | 2.76                | 84         | 0.08                | 11         | 0.05                | 8          |
| Norfolk (2022 to 2024)                        | 22.95               | 757        | 2.67                | 631        | 1.15                | 336        |
| Suffolk (2022 to 2024)                        | 11.70               | 289        | 1.55                | 354        | 0.55                | 138        |

Source: Visit Britain

- 17.4.18 In terms of employment, BRES data provides a breakdown of the number of people employed in the tourism sector (workplace-based) [13]. Table shows tourism employment for each of the socio-economic study areas.
- 17.4.19 Tourism employment accounts for 13% of total employment in the LPA study area, with tourism employment in GYBC and ESC exceeding the

average (21% and 14% respectively) and MSDC and SNDC below the average (both 8% respectively). Tourism employment in the LPA study area accounts for a higher proportion of total employment than in comparison to the county, regional and national averages.

Table 17-7: Tourism Employment (2024)

|                             | Tourism Employment | Tourism Employment as a % of Total Employment |
|-----------------------------|--------------------|-----------------------------------------------|
| ESC                         | 13,650             | 14%                                           |
| GYBC                        | 8,145              | 21%                                           |
| MSDC                        | 3,135              | 8%                                            |
| SNDC                        | 4,945              | 8%                                            |
| <b>Total LPA study area</b> | <b>29,875</b>      | <b>13%</b>                                    |
| Norfolk                     | 46,950             | 12%                                           |
| Suffolk                     | 37,850             | 11%                                           |
| East of England             | 288,000            | 10%                                           |
| England                     | 2,940,000          | 10%                                           |

Source: ONS, BRES 2024

17.4.20 Table 17-8 shows tourist employment by Standard Industrial Classification ('SIC') code as a proportion of all tourism employment. The majority of tourism employment across all of the socio-economic study areas is in the food and beverage sector. The accommodation sector and sports and amusements sector also account for a significant proportion of tourism employment.

Table 17-8: Tourism Employment by SIC Code as a Proportion of All Tourism Employment (2024)

|                             | Accommodation | Food and Beverage | Travel Agency | Creative Arts | Cultural Activities | Gambling and Betting | Sports and Amusements |
|-----------------------------|---------------|-------------------|---------------|---------------|---------------------|----------------------|-----------------------|
| ESC                         | 25%           | 49%               | 3%            | 2%            | 3%                  | 3%                   | 14%                   |
| GYBC                        | 44%           | 37%               | 1%            | 2%            | 2%                  | 6%                   | 9%                    |
| MSDC                        | 8%            | 62%               | 2%            | 4%            | 7%                  | 0%                   | 18%                   |
| SNDC                        | 16%           | 61%               | 3%            | 2%            | 3%                  | 1%                   | 14%                   |
| <b>Total LPA study area</b> | <b>27%</b>    | <b>50%</b>        | <b>2%</b>     | <b>2%</b>     | <b>3%</b>           | <b>3%</b>            | <b>12%</b>            |
| Norfolk                     | 20%           | 55%               | 2%            | 2%            | 4%                  | 2%                   | 15%                   |
| Suffolk                     | 19%           | 52%               | 2%            | 3%            | 3%                  | 2%                   | 19%                   |
| East of England             | 13%           | 59%               | 3%            | 3%            | 4%                  | 2%                   | 16%                   |
| England                     | 14%           | 61%               | 3%            | 3%            | 3%                  | 2%                   | 15%                   |

Source: ONS, BRES 2024

17.4.21 Table 17-9 provides the total tourist accommodation stock in each of the LPAs in the LPA study area, Suffolk and Norfolk. It has been broken down into serviced accommodation i.e. hotels and guest houses, and non-serviced accommodation i.e. self-catering accommodation. The most recent data available is 2016, with new data due to be published in 2026 but which has not been released yet. The new data will be used to inform the ES chapter, when available.

17.4.22 Across the LPA study area, there are a total of 1,393 tourist accommodation facilities, with the majority (62%) being non-serviced facilities. Non-serviced accommodation also represents the greatest proportion of tourist accommodation stock in ESC, MSDC, Norfolk and Suffolk. In contrast, serviced accommodation accounts for the highest proportion of tourist accommodation in GYBC and SNDC.

Table 17-9: Tourist Accommodation Stock (2016)

|                                            | Total        | Serviced   | Non-serviced |
|--------------------------------------------|--------------|------------|--------------|
| ESC (formerly Suffolk Coastal and Waveney) | 838          | 209        | 629          |
| MSDC                                       | 130          | 60         | 70           |
| GYBC                                       | 281          | 176        | 105          |
| SNDC                                       | 144          | 79         | 65           |
| <b>Total LPA study area</b>                | <b>1,393</b> | <b>524</b> | <b>869</b>   |
| Norfolk                                    | 2,137        | 789        | 1,348        |
| Suffolk                                    | 1,285        | 476        | 809          |

Source: Visit Britain

### Local Study Area

17.4.23 This section provides socio-economic baseline information for the local study area which as discussed earlier (in Section 17.2), comprises data for all MSOAs that intersect within a 2km radius of the EIA Scoping Area.

### Resident Population

17.4.24 It is estimated that the local study area has a total resident population of 175,700 people according to the 2024-Mid Year Population Estimates as demonstrated in Table 17-10. The age profile of the local study area is older than the LPA study area (refer to Table 17-1), with a lower proportion of working age people (aged 16 to 64 years) and a higher proportion of the total population aged 65+ years.

Table 17-10 Resident Population (2024) of the Local Study Area

|                     | Number of Residents | % of Total Population |
|---------------------|---------------------|-----------------------|
| Aged 0 to 15 years  | 26,200              | 15%                   |
| Aged 16 to 64 years | 97,500              | 55%                   |
| Aged 65+ years      | 52,100              | 30%                   |
| Total population    | 175,700             | 100%                  |

Source: ONS, *Mid-Year Population Estimates (2024)*. Figures have been individually rounded to the nearest 100.

### Economic Activity

17.4.25 Between January and December 2025, there were 59,900 residents in the local study area aged 16 to 64 who were classified as economically active (this includes all those people in employment or available to work, for example, the unemployed). This is equivalent to 86.2% of the population aged 16 to 64 years.

17.4.26 Of those economically active residents in the local study area, 59,200 were in employment, representing an employment rate of 85.1%.

17.4.27 The remaining 400 economically active residents in the local study area were unemployed, which represents an unemployment rate of 0.7%.

### Employment by Industry (workplace-based)

17.4.28 The local study area supports employment of 57,725 jobs according to the BRES data (Table 17-11). The largest proportion of employment in the local study area (16%) is within the manufacturing industry. Other significant industries in the local study area are accommodation and food services (representing 12% of all employment) and the health and education sectors (each representing 10% of all employment).

Table 17-11: Workplace-based Employment (2024)

| Industry                                         | % of Total Employment in the Local Study Area |
|--------------------------------------------------|-----------------------------------------------|
| Agriculture, forestry & fishing                  | 1%                                            |
| Mining, quarrying & utilities                    | 3%                                            |
| Manufacturing                                    | 16%                                           |
| Construction                                     | 9%                                            |
| Motor trades                                     | 3%                                            |
| Wholesale                                        | 3%                                            |
| Retail                                           | 9%                                            |
| Transport & storage (including postal)           | 3%                                            |
| Accommodation & food services                    | 12%                                           |
| Information & communication                      | 1%                                            |
| Financial & insurance                            | 0%                                            |
| Property                                         | 2%                                            |
| Professional, scientific & technical             | 5%                                            |
| Business administration & support services       | 8%                                            |
| Public administration & defence                  | 1%                                            |
| Education                                        | 10%                                           |
| Health                                           | 10%                                           |
| Arts, entertainment, recreation & other services | 4%                                            |
| <b>Total employment</b>                          | <b>57,725</b>                                 |

Source: ONS, BRES 2024

### Business and Industry

17.4.29 There is a total of 7,455 businesses within the local study area. The majority (91%) of these businesses employ less than 9 people. Table 17-12 demonstrates that the businesses in the local study area are predominantly

construction (16%), agricultural forestry and fishing (15%) or professional, scientific and technical (13%).

Table 17-12: Business Count by Sector (2025)

| Industry                                         | % of All Businesses in the Local Study Area |
|--------------------------------------------------|---------------------------------------------|
| Agriculture, forestry & fishing                  | 15.1%                                       |
| Mining, quarrying & utilities                    | 0.5%                                        |
| Manufacturing                                    | 5.5%                                        |
| Construction                                     | 15.7%                                       |
| Motor trades                                     | 3.4%                                        |
| Wholesale                                        | 3.1%                                        |
| Retail                                           | 6.7%                                        |
| Transport & storage (including postal)           | 3.2%                                        |
| Accommodation & food services                    | 5.8%                                        |
| Information & communication                      | 3.8%                                        |
| Financial & insurance                            | 1.4%                                        |
| Property                                         | 3.3%                                        |
| Professional, scientific & technical             | 12.6%                                       |
| Business administration & support services       | 8.0%                                        |
| Public administration & defence                  | 1.7%                                        |
| Education                                        | 1.4%                                        |
| Health                                           | 2.6%                                        |
| Arts, entertainment, recreation & other services | 6.2%                                        |

Source: ONS, Business Counts 2025. All figures are rounded and may not sum.

## Tourism

17.4.30 It is estimated that the local study area supports employment in the tourism sector of 8,150 jobs, which represents 14% of total employment in the local study area.

17.4.31 The majority of tourism employment in the local study area is within the food and beverage sector as shown in Table 17-13.

Table 17-13 Tourism Employment in the Local Study Area

| Industry              | % of Tourism Employment in the Local Study Area |
|-----------------------|-------------------------------------------------|
| Accommodation         | 37%                                             |
| Food and Beverage     | 43%                                             |
| Travel Agency         | 3%                                              |
| Creative Arts         | 2%                                              |
| Cultural Activities   | 4%                                              |
| Gambling and Betting  | 1%                                              |
| Sports and Amusements | 10%                                             |

Source: ONS, BRES 2024

## Hyper Local Study Area

17.4.32 This section provides socio-economic baseline information for businesses within the hyper local study area.

## Proposed LSO

17.4.33 As shown on Table 17-14, there are a total of 23 businesses located on land within a 500m radius of the proposed LSO section of the EIA Scoping Area. These businesses are mainly within the accommodation and food industry (seven) including three large holiday parks, Haven Hopton Holiday Village, Broadland Sands Holiday Park and Potters Resort.

17.4.34 In addition to the identified businesses located on this area of land, the coastal area which the proposed LSO section of the EIA Scoping Area extends into supports a number of commercial fisheries, comprising small



inshore trawlers fishing for species such as cod, sole, plaice, whiting and ray species, and recreational businesses, such as boating tours.

Table 17-14: Businesses within 500m of the Proposed LSO Section of the EIA Scoping Area (the terrestrial area)

| Ref | Business                                 | Post Code | Industry                                     |
|-----|------------------------------------------|-----------|----------------------------------------------|
| 1   | Haven Hopton Holiday Village             | NR31 9BW  | Accommodation and Food                       |
| 2   | Waters' Retreat at Hopton                | NR31 9BW  | Accommodation and Food                       |
| 3   | The Turnstone Pub                        | NR31 9BH  | Accommodation and Food                       |
| 4   | Birdies Driving School                   | NR31 9RZ  | Motor Trades                                 |
| 5   | Morrisons Daily                          | NR31 9BH  | Retail                                       |
| 6   | The Worx Hair Studio                     | NP31 9SF  | Health                                       |
| 7   | Potters Resort                           | NR31 9BX  | Accommodation and Food                       |
| 8   | Beauty by Chloe                          | NP31 9YA  | Health                                       |
| 9   | Ideal Staffing Agency                    | NR31 9YA  | Business Administrative and Support Services |
| 10  | Hopton Legionella                        | NR31 9BZ  | Property                                     |
| 11  | TM Ski and Travel                        | NR31 9UX  | Professional, Scientific and Technical       |
| 12  | AS15DA Express                           | NR31 9AH  | Retail                                       |
| 13  | The White Hart                           | NR31 9AH  | Accommodation and Food                       |
| 14  | The Bubble Design Company (Web Designer) | NR31 9DB  | Information and Communication                |

| Ref | Business                     | Post Code | Industry                                         |
|-----|------------------------------|-----------|--------------------------------------------------|
| 15  | Stardust Amusements          | NR31 9BN  | Arts, Entertainment, Recreation & Other Services |
| 16  | Bubbles Family Amusements    | NR31 9BN  | Arts, Entertainment, Recreation & Other Services |
| 17  | Access-Able Adventures       | NR31 9BW  | Health                                           |
| 18  | Apollo Canine Services       | NR31 9DQ  | Arts, Entertainment, Recreation & Other Services |
| 19  | Hopton Manor                 | NR31 9BB  | Accommodation and Food                           |
| 20  | Equine Emporium (Shop)       | NR31 9BD  | Retail                                           |
| 21  | The Photo Pod Company        | NR31 9DA  | Arts, Entertainment, Recreation & Other Services |
| 22  | Skinful Aesthetics           | NR31 9SX  | Health                                           |
| 23  | Broadland Sands Holiday Park | NR32 5LQ  | Accommodation and Food                           |

Source: Landstack, Google and CoStar

### Proposed AWRP to River Waveney Pipeline

17.4.35 As shown on Table 17-15, there are a total of 22 businesses within 500m of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area. A large proportion of these are agricultural businesses.

Table 17-15: Businesses within 500m of the Proposed AWRP to Waveney Pipeline Section of the EIA Scoping Area

| Ref | Business                                         | Post Code | Industry                        |
|-----|--------------------------------------------------|-----------|---------------------------------|
| 1   | Ilias (East Anglia) Ltd, Builder (Building firm) | NR35 2HJ  | Agriculture                     |
| 2   | L P Pallett Quarry Ltd                           | NR35 2HJ  | Mining, quarrying and utilities |

| Ref | Business                           | Post Code | Industry                                         |
|-----|------------------------------------|-----------|--------------------------------------------------|
| 3   | Portrait Images (Photographer)     | NR34 0HH  | Arts, entertainment, recreation & other services |
| 4   | Winston Game Farm                  | NR34 0HH  | Agriculture                                      |
| 5   | Rose Lodge farm                    | NR34 0HD  | Agriculture                                      |
| 6   | Green Farm                         | NR34 0HA  | Agriculture                                      |
| 7   | The Horse Rescue fund (non-profit) | NR34 0EH  | Agriculture                                      |
| 8   | Elms Barn (Wedding Venue)          | NR34 0EJ  | Accommodation and food                           |
| 9   | PW & AP Alden farm                 | NR34 0EL  | Agriculture                                      |
| 10  | Church Farm                        | NR34 0EX  | Agriculture                                      |
| 11  | Station Yard Storage               | NR34 0BY  | Transport and Storage                            |
| 12  | The Farmhouse kitchen (cafe)       | NR34 0AS  | Accommodation and Food                           |
| 13  | Woodcock Cottage (hotel)           | NR34 0AS  | Accommodation and Food                           |
| 14  | E S Burroughs Dairy (Dairy Farm)   | NR34 0AS  | Agriculture                                      |
| 15  | Carr Farm                          | NR34 0AD  | Agriculture                                      |
| 16  | M D Fish Building Services         | NR32 5NQ  | Construction                                     |
| 17  | Monsieur Lees (fishing charter)    | NR32 0AS  | Agriculture                                      |
| 18  | The Lodge (restaurant)             | NR34 5LE  | Accommodation and food                           |
| 19  | Ellingham Grain                    | NR34 2ER  | Agriculture                                      |

| Ref | Business                                | Post Code | Industry    |
|-----|-----------------------------------------|-----------|-------------|
| 20  | The LP Group (provides public services) | NR35 2HJ  | Agriculture |
| 21  | Upland Fram                             | NR34 0HH  | Agriculture |
| 22  | Edwards M J S & Partners (Farm)         | NR34 5LE  | Agriculture |

Source: Landstack, Google and CoStar

### Proposed Barsham WTW to CSR Pipeline

17.4.36 As shown on Table 17-16-16, there are 11 businesses within a 500m radius of the proposed Barsham WTW to CSR section of the EIA Scoping Area. The majority of these are agricultural businesses (seven), such as Ash Tree Farm and Walpole Hatch Farm. The remainder are accommodation and food, health and construction businesses.

Table 17-16: Businesses within 500m of the Proposed Barsham WTW to CSR Section of the EIA Scoping Area

| Ref | Business                                    | Post Code | Industry     |
|-----|---------------------------------------------|-----------|--------------|
| 1   | Oliver James Windows and Conservatories     | NR34 8NY  | Construction |
| 2   | Winzor-Saile Ltd Farm                       | NR34 8LB  | Agriculture  |
| 3   | Meadows Evening Equestrian Centre           | IP19 0RR  | Agriculture  |
| 4   | Aldous J & D S & E Agriculture and Forestry | IP19 0AW  | Agriculture  |
| 5   | Ash Tree Farm                               | IP19 0NA  | Agriculture  |
| 6   | Sweet Chestnut Therapies                    | IP19 9BB  | Health       |
| 7   | The Harmony Centre Health and Wellness      | IP19 9BB  | Health       |

| Ref | Business                                         | Post Code | Industry               |
|-----|--------------------------------------------------|-----------|------------------------|
| 8   | Hill View Bed and Breakfast                      | IP19 9BB  | Accommodation and Food |
| 9   | Walpole Hatch Farm                               | 1P19 9AZ  | Agriculture            |
| 10  | Brook Farm Bramfield                             | IP19 9BH  | Agriculture            |
| 11  | Centaur Trust, Earlsway Farm (Equestrian Centre) | 1P19 9AD  | Agriculture            |

Source: Landstack, Google and CoStar

### Proposed CSR to WSR Pipeline

17.4.37 As shown on Table 17-17-17, there are 21 businesses within a 500m radius of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. Eight of these businesses are in the accommodation and food industry, including Croft Campsite and Oak Lodge Retreat. The remaining businesses are in the agriculture; health; construction; manufacturing; and, arts, entertainment, recreation industries.

Table 17-17: Businesses within 500m of the Proposed CSR to WSR Pipeline Section of the EIA Scoping Area

| Ref | Business                      | Post Code | Industry               |
|-----|-------------------------------|-----------|------------------------|
| 1   | Croft Campsite                | IP19 0HB  | Accommodation and Food |
| 2   | Green Valley Farm             | IP19 0HB  | Agriculture            |
| 3   | Noyes Farm                    | IP13 8HZ  | Agriculture            |
| 4   | Helen Luted Language Services | IP13 8JA  | Education              |
| 5   | Laxfield Lodges               | IP13 8HE  | Accommodation and Food |

| Ref | Business                                                  | Post Code | Industry                        |
|-----|-----------------------------------------------------------|-----------|---------------------------------|
| 6   | Les Cotton Contractors                                    | IP13 8EG  | Construction                    |
| 7   | Hall Farm                                                 | IP13 8EG  | Agriculture                     |
| 8   | Massage by Rach                                           | IP21 5LD  | Health                          |
| 9   | Church Farm                                               | IP21 5LT  | Agriculture                     |
| 10  | Charlotte's Wood (outdoor activity)                       | IP21 5LT  | Arts, entertainment, recreation |
| 11  | Hill Farm House B&B                                       | IP21 5ED  | Accommodation and Food          |
| 12  | Grove Farm Denham                                         | IP21 5ET  | Agriculture                     |
| 13  | Nationwide Metal Recycling                                | IP21 5EX  | Manufacturing                   |
| 14  | Frank Davey (construction company)                        | IP23 8AN  | Construction                    |
| 15  | Oaklawn Cottage                                           | IP23 7NN  | Accommodation and Food          |
| 16  | Camomile Cottage B&B and Chubbs Barn Luxury Self Catering | IP23 7HW  | Accommodation and Food          |
| 17  | Mustard Pot Cottage                                       | IP23 7HW  | Accommodation and Food          |
| 18  | Mink Farm                                                 | IP23 8AN  | Agriculture                     |
| 19  | Oak Lodge Retreat                                         | IP23 8AL  | Accommodation and Food          |
| 20  | Gregory Groundworks                                       | IP23 8AL  | Construction                    |
| 21  | Four Oaks Park                                            | IP23 8AL  | Accommodation and Food          |

Source: Landstack, Google and CoStar

## Proposed CSR to Saxmundham Pipeline

17.4.38 As shown on Table 17-18-18, there are 34 businesses within a 500m radius of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area. A large proportion of these businesses (thirteen) are within the accommodation and food industry such as the Sibton Park Estate Wilderness Reserve and Thurstons Farm Camping and B&B. Other businesses are in the manufacturing, health, property, educations, arts, entertainment and recreation, and professional industries.

Table 17-18: Businesses within 500m of the Proposed CSR to Saxmundham Pipeline Section of the EIA Scoping Area

| Ref | Business                                | Post Code | Industry               |
|-----|-----------------------------------------|-----------|------------------------|
| 1   | Sibton Park Estate - Wilderness Reserve | IP17 2LY  | Accommodation and Food |
| 2   | Cedar Bungalow (poultry farm)           | IP17 2ND  | Agriculture            |
| 3   | Upper Grove Farm (farm stay)            | IP17 2NQ  | Agriculture            |
| 4   | Thurston's Farm Camping                 | IP17 2AS  | Accommodation and Food |
| 5   | Thurston's Farm B&B (and wedding venue) | IP17 2AR  | Accommodation and Food |
| 6   | World of Wellness (Beauty salon)        | IP17 2QP  | Health                 |
| 7   | The Mover Man (House clearance service) | IP17 1BY  | Property               |
| 8   | Meadow Brook Play care (nursery school) | IP17 1DZ  | Education              |
| 9   | Suffolk Cottage Catering                | IP17 2LX  | Accommodation and Food |
| 10  | Agrihort (Farm Equipment supplier)      | IP17 2NB  | Agriculture            |
| 11  | Lonely Farm Camping and Caravan site    | IP17 2QP  | Accommodation and Food |

| Ref | Business                                                    | Post Code | Industry                        |
|-----|-------------------------------------------------------------|-----------|---------------------------------|
| 12  | Drywood Ltd (furniture maker)                               | IP17 2AY  | Manufacturing                   |
| 13  | Holiday Lodge in Carlton Meres                              | IP17 2AY  | Accommodation and Food          |
| 14  | Saxmundham Fire Station                                     | IP17 1DZ  | Health                          |
| 15  | Carlton Meres Holiday Park                                  | IP17 2QP  | Accommodation and Food          |
| 16  | Stove Tec Wood stove shop                                   | IP17 2QW  | Manufacturing                   |
| 17  | POBs Pyro and Full Effect Fireworks                         | IP17 1WG  | Manufacturing                   |
| 18  | Suffolk Cottage Catering (catering food and drink supplier) | IP17 2LX  | Accommodation and Food          |
| 19  | Dawn's Boarding cattery                                     | IP17 2LX  | Accommodation and Food          |
| 20  | Burnt House Farm                                            | IP17 2AA  | Agriculture                     |
| 21  | Saxmundham Ambulance Station                                | IP17 1DZ  | Health                          |
| 22  | Stove-Tec                                                   | IP17 2QW  | Manufacturing                   |
| 23  | Velo Hire Bike Hire                                         | IP17 2QW  | Arts, entertainment, recreation |
| 24  | Orchard Wild Camping                                        | IP17 2QW  | Accommodation and Food          |
| 25  | Carlton Footcare                                            | IP17 2QW  | Health                          |
| 26  | Vale Farm                                                   | IP17 2QJ  | Agriculture                     |
| 27  | PE Gray Plumbing and Heating                                | IP17 2QZ  | Construction                    |
| 28  | Upper Grove Farm Holiday Cabins                             | IP17 2AS  | Accommodation and Food          |



| Ref | Business                         | Post Code | Industry                               |
|-----|----------------------------------|-----------|----------------------------------------|
| 29  | Finewood Home Furniture Shop     | IP17 2AS  | Manufacturing                          |
| 30  | Waste Management Total Solutions | IP17 2AS  | Professional, scientific and technical |
| 31  | Broad Oak Farm                   | 1P17 2EU  | Agriculture                            |
| 32  | Woodlands Farm                   | IP17 2HB  | Agriculture                            |
| 33  | Birds and Bees Campsite          | IP17 2AW  | Accommodation and Food                 |
| 34  | Thurston's Farm Camping          | IP17 2AR  | Accommodation and Food                 |

Source: Landstack, Google and CoStar

### Proposed Saxmundham to SZC Pipeline

17.4.39 As shown on Table 17-19-19, there are a total of four businesses within a 500m radius of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area, including SZC. These are in the professional, scientific and technical; accommodation and food; mining, quarrying and utilises; and agriculture industries.

Table 17-19: Businesses within 500m of the Proposed Saxmundham to Sizewell C Pipeline Section of the EIA Scoping Area

| Ref | Business                      | Post Code | Industry                               |
|-----|-------------------------------|-----------|----------------------------------------|
| 1   | Grapho Design and Imagery     | IP17 2QZ  | Professional, scientific and technical |
| 2   | Kelsale Holiday Cottages      | IP17 2RD  | Accommodation and Food                 |
| 3   | East Suffolk Donkey Sanctuary | IP17 2RF  | Agriculture                            |
| 4   | SZC                           | IP16 4EW  | Mining, quarrying and utilities        |

Source: Landstack and CoStar

## Proposed Eastern Distribution Mains

17.4.40 As shown on Table 17-20, there are a total of 18 businesses within 500m of the proposed Eastern Distribution Mains section of the EIA Scoping Area. The highest proportion of businesses are within the Accommodation and Food Industry (six), with other businesses being in the construction and retail industries (two), amongst others.

Table 17-20: Businesses within 500m of the Proposed Eastern Distribution Mains Section of the EIA Scoping Area (the terrestrial area)

| Ref | Business                               | Post Code | Industry                        |
|-----|----------------------------------------|-----------|---------------------------------|
| 1   | The Railway Tavern                     | IP23 8DU  | Accommodation and Food          |
| 2   | The Limes Retirement Home              | IP23 8DY  | Health                          |
| 3   | Thistle and Rose Florist               | IP23 8DY  | Retail                          |
| 4   | Mellis Welding Supplies                | IP23 8DS  | Retail                          |
| 5   | Ian Hubbard Electrical                 | IP23 8DR  | Construction                    |
| 6   | W Beecroft Farm                        | IP23 8EE  | Agriculture                     |
| 7   | Space at Yaxley Manor Education Centre | IP23 8DG  | Education                       |
| 8   | Elaine Brown Complete Therapy          | IP23 8DQ  | Health                          |
| 9   | Mr Hares Shepherd Hut                  | IP23 8DB  | Accommodation and Food          |
| 10  | The Party Startes Wedding Services     | IP23 8DH  | Arts, entertainment, recreation |
| 11  | Cherry Tree Bar and Tandoor            | IP23 8BH  | Accommodation and Food          |
| 12  | GM Plastering and Lime Rendering       | IP23 8DH  | Construction                    |

| Ref | Business                    | Post Code | Industry                |
|-----|-----------------------------|-----------|-------------------------|
| 13  | Truebeam Construction       | IP23 8BH  | Construction            |
| 14  | Rotary Rebuild Autoparts    | IP21 2BL  | Motor trades            |
| 15  | Platinum Cask Investment    | IP23 8AT  | Financial and insurance |
| 16  | The Studio Holiday Home     | IP23 8AP  | Accommodation and Food  |
| 17  | Best Western Brome Grange   | IP23 8AP  | Accommodation and Food  |
| 18  | Stanwick House Dog Day Care | IP23 8AP  | Accommodation and Food  |

Source: Landstack, Google and CoStar

### Proposed Western Distribution Mains

17.4.41 As shown on Table 17-21, there are a total of 10 businesses within 500m of the proposed Western Distribution Mains section of the EIA Scoping Area. These businesses are in the agricultural sector (three), accommodation and food (two), arts and recreation (twenty), construction, retail and motor trades.

Table 17-21: Businesses within 500m of the Proposed Western Distribution Mains Section of the EIA Scoping Area (the terrestrial area)

| Ref | Business                  | Post Code | Industry                        |
|-----|---------------------------|-----------|---------------------------------|
| 1   | Quest Antiques            | IP14 4TH  | Retail                          |
| 2   | Shelly Brand Smallholding | IP14 4TN  | Agriculture                     |
| 3   | Watermead Firewood        | IP14 4TN  | Agriculture                     |
| 4   | Martin Roper Photographer | IP14 4TW  | Arts, entertainment, recreation |

| Ref | Business                               | Post Code | Industry                        |
|-----|----------------------------------------|-----------|---------------------------------|
| 5   | MJL Plumbing and Heating Suffolk       | IP14 4TH  | Construction                    |
| 6   | The Little Sugar Rose Wedding Services | IP14 4JB  | Arts, entertainment, recreation |
| 7   | Cherry Cottage                         | IP14 4JE  | Accommodation and Food          |
| 8   | Stanwell Farm Caravan Site             | IP14 4JA  | Accommodation and Food          |
| 9   | MJ Hardwick Vehicle Repair             | IP14 4HZ  | Motor trades                    |
| 10  | TA Cracknell Livestock Breeder         | IP14 4JE  | Agriculture                     |

Source: Landstack, Google and CoStar

## Other Components of the Proposed Development

17.4.42 The other components of the Proposed Development comprise the proposed AWRP, CSR and WSR. No businesses have been identified within 500m of these sections of the EIA Scoping Area.

## 17.5 Likely Significant Effects

17.5.1 The Proposed Development has the potential to provide a combination of beneficial and adverse socio-economic effects during the construction, operational and decommissioning phases, some of which will be negligible and some significant.

17.5.2 There is the potential for likely significant socio-economic effects on the following:

- Jobs and employment.
- Skills and the labour market.
- Business enterprises (terrestrial and maritime businesses).
- Tourism.

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## Construction and Decommissioning Phases

- 17.5.3 Decommissioning phase impacts from the Proposed Development on socio-economic receptors are anticipated to be of a similar, but no greater magnitude, than those anticipated during the construction phase. As such, likely significant effects during the construction and decommissioning phases are outlined together to avoid repetition.

### Jobs and Employment

- 17.5.4 The Proposed Development will support jobs during the construction and decommissioning phases, both directly and indirectly through supply chain linkages. A proportion of the jobs have the potential to support employment for the local workforce.
- 17.5.5 The number of jobs directly and indirectly supported will fluctuate over the construction and decommissioning periods depending on the activity undertaken. However, the number of jobs and level of local employment sustained during these phases has the potential to be significant.

### Skills and the Labour Market

- 17.5.6 There is the potential for upskilling and training opportunities of the Proposed Development's workforce with effects during the construction and decommissioning phases anticipated to be significant.

### Business Enterprises

- 17.5.7 The Proposed Development has the potential to disrupt existing business operations on terrestrial businesses, together with maritime businesses operating within the coastal area around the proposed LSO component. Businesses located within the EIA Scoping Area have the potential to be permanently affected if business operations need to cease as a result of the Proposed Development. However, no permanent losses are anticipated given that no existing businesses are expected to need to cease operations.
- 17.5.8 Temporary disruption to existing business' operations is more likely during the construction and decommissioning phases.

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### *Terrestrial Businesses*

- 17.5.9 For terrestrial businesses, impacts will be linked to other impacts such as traffic, visual and noise. The extent of the effects will be dependent on proximity of the existing businesses to the Proposed Development and the type of business, with some types of businesses being more sensitive than others. There is the potential for beneficial effects to occur for local businesses from the Proposed Development via increased spending from the associated workforce. Such effects have the potential to be significant during the construction and decommissioning phases.

### *Maritime Businesses*

- 17.5.10 Impacts on maritime businesses may arise from temporary exclusions or safety zones and increased construction vessel movements. Restrictions on access and navigation may displace commercial fisheries and recreational maritime businesses, affecting business income and tourism related activity. The extent of the impact will depend on the duration and scale of works, existing maritime users, and embedded mitigation. At this scoping stage, it is assumed that the effect on maritime businesses has the potential to be significant during the construction and decommissioning phases. A Navigation Risk Assessment will be submitted in support of the DCO application (should the final design of the Proposed Development include Option 1 of the LSO component) and used to inform the socio-economics chapter of the ES.

### *Tourism*

- 17.5.11 There is the potential for the Proposed Development to impact adversely on existing tourist attractions in the locality of the Proposed Development. Such effects will be related to amenity value attributed to noise, visual, traffic and maritime navigation effects.
- 17.5.12 There is also the potential for the Proposed Development to impact on the temporary accommodation market (for example, B&Bs and hotels) as this accommodation may be required to accommodate construction workers which would reduce availability for tourists resulting in an adverse effect.

However, conversely, effects could be beneficial because housing the Proposed Development's construction workers could provide a steady income for temporary accommodation providers especially during off-peak tourism periods. Effects have the potential to be significant during the construction and decommissioning phases.

## Operational Phase

### Business Enterprises

- 17.5.13 The Proposed Development has the potential to generate beneficial operational effects through the provision of a direct water supply. However, the nature and extent of any downstream economic effects arising from changes in water availability to existing or future business water users are highly uncertain and dependent on a wide range of factors, including future regulatory requirements, water resource management decisions, market conditions and business responses.
- 17.5.14 This includes the current restrictions on new business water connections within parts of the region, which may change over the operational life of the Proposed Development. As a result, any wider indirect economic effects associated with future business activity enabled by improved water supply are considered too uncertain and speculative to assess robustly and have therefore been scoped out of the assessment.
- 17.5.15 This approach is consistent with other chapters of the Scoping Report, including chapter 16 climate change and chapter 21 materials and waste.

## 17.6 Impacts Scoped Out of the Assessment

### Operational Phase

#### Jobs and Employment

- 17.6.1 The number of jobs (direct and indirect) supported once the Proposed Development is operational is anticipated to be limited because operation of the Proposed Development will be largely automated, relying on advanced monitoring and control systems rather than a large on-site workforce.

Staffing is typically restricted to a small number of skilled technicians and maintenance personnel who oversee operations, conduct routine inspections, and respond to any system issues as needed. Job and employment effects during the operational phase are therefore not anticipated to be significant (which would be indicated by a high-volume of jobs and local employment) and therefore it is proposed to scope out an assessment of operational job and employment effects from the socio-economics chapter of the ES.

### **Skills and the Labour Market**

- 17.6.2 Operational job and employment opportunities are anticipated to be limited and therefore operational effects on skills and the labour market (which are dependent on jobs and employment) are also anticipated to be not significant and therefore it is proposed to scope out an assessment of operational effects on skills and the labour market from the socio-economics chapter of the ES.

### **Business Enterprises**

#### *Maritime Businesses*

- 17.6.3 During the operational phase, socio-economic effects on maritime businesses are anticipated to be limited and predominantly confined to the immediate vicinity of the proposed offshore LSO infrastructure (Option 1 for the LSO component of the Proposed Development). Navigational risks arising from the presence and operation of the LSO (Option 1) are anticipated to be manageable and as low as reasonably practicable ('ALARP') compliant, subject to standard mitigation measures and stakeholder engagement.
- 17.6.4 For commercial fisheries, no significant effects are anticipated from the Proposed Development at this scoping stage. Minor and localised displacement of fishing activity may occur in the vicinity of the infrastructure. However, the impact on water quality is anticipated to be low based on the dispersion modelling undertaken and will be analysed in the water environment chapter of the ES. Therefore, there is a low risk to fish



populations and impacts on commercial fisheries is not anticipated to be significant and it is proposed to scope out an assessment of operational effects on maritime businesses from the socio-economics chapter of the ES.

### **Tourism**

- 17.6.5 Once the Proposed Development is complete, no significant effects on tourism are anticipated. As stated in Section 17.5, impacts on tourism are mainly associated with amenity value (attributed to noise, visual and traffic impacts) and such operational effects are not anticipated to be significant. The operational workforce is anticipated to be limited and not expected to require local accommodation. Operational effects on the temporary accommodation market are therefore also not anticipated to be significant.
- 17.6.6 Significant beneficial effects on tourism are also not anticipated during the operational phase, as the Proposed Development will not introduce any new opportunities for tourism. Therefore, it is proposed to scope out an assessment of these effects from the socio-economics chapter of the ES.

### **All Phases (Construction, Operational and Decommissioning)**

#### **Education and Visitor Facilities**

- 17.6.7 The Proposed Development does not incorporate the provision of education and visitor facilities and therefore this impact is proposed to be scoped out of the assessment in the socio-economics chapter of the ES.

#### **Local Services**

- 17.6.8 The impact on local services such as open space, leisure and play, health and social care services and wider societal infrastructure is considered within the human health chapter of the ES (refer to chapter 18 human health of this Scoping Report).

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## 17.7 Proposed Approach to Mitigation

- 17.7.1 Mitigation measures will be developed as site-specific information and data is gathered, the Proposed Development is refined and the ES is prepared. Mitigation measures will be identified as per the agreed mitigation hierarchy.

### Primary (Inherent) Mitigation

- 17.7.2 The Proposed Development has been designed to incorporate primary mitigation of socio-economic impacts from the outset, including the selection of the routing for the proposed pipeline components and the locations and layouts of the proposed AWRP, CSR and WSR components in order to minimise effects on socio-economic receptors throughout the construction, operational, and decommissioning phases.

### Secondary (Foreseeable) Mitigation

- 17.7.3 An OSEP Outline Skills and Employment Plan ('OSEP') will be prepared to enhance identified job and employment effects to maximise public benefit and facilitate positive and meaningful commitments and activities within the East of England region by the Applicant with respect to employment and skills. The OSEP will be developed with key stakeholders and submitted in support of the DCO application.
- 17.7.4 Further secondary mitigation measures may be identified during the preparation of the socio-economics chapter of the ES.

### Tertiary (Inexorable) Mitigation

- 17.7.5 The following tertiary mitigation measures would be expected to minimise the socio-economic impacts:
- A Construction Environmental Management Plan ('CEMP') will be prepared prior to the commencement of works to ensure best practice is followed and the environment is safeguarded. It will be in accordance with the Outline Construction Environmental Management Plan ('OCEMP') to be submitted in support of the DCO application. The CEMP will include method statements for the proposed works, details of materials to be transported to and from the site, and a pollution control and contingency plan. As such, the CEMP will mitigate adverse impacts on the environment and local community, including business

enterprises. For the decommissioning phase of the Proposed Development, a Decommissioning Environmental Management Plan ('DEMP') will be prepared prior to the commencement of works to ensure best practice is followed and the environment is safeguarded. It will be in accordance with the Outline Decommissioning Environmental Management Plan ('ODEMP') to be submitted in support of the DCO application.

## 17.8 Proposed Approach to the ES

### Best Practice Guidance

17.8.1 Relevant guidance and standards that have been used to inform the scoping assessment and that will inform the assessment of likely significant socio-economic effects in the socio-economics chapter of the ES include:

- Section 4.13 of the NPSWRI.
- HM Treasury's The Green Book – Central Government Guidance on Appraisal and Evaluation (2026) [14].
- Homes England's (formerly the Homes & Communities Agency) Additionality Guide – Fourth Edition (2014) [15].

### Assessment Methodology

17.8.2 The socio-economic assessment will comprise the following stages:

- Identification of current and future baseline socio-economic conditions using information and statistics available in the public domain via desk-based exercise.
- Assessment of the direct and indirect likely significant effects of the Proposed Development on the identified receptors (jobs and employment, skills and the labour market, business enterprises and tourism) by reviewing the baseline conditions and determining the change attributable to the Proposed Development using published formulae and guidance to assess effects. Recommendation of mitigation or enhancement measures, if necessary.
- Assessment of residual effects assuming implementation of the mitigation/enhancement measures.
- Assessment of the identified cumulative schemes for the potential to have likely significant cumulative socio-economic effects when combined with the Proposed Development.

17.8.3 The methodology proposed to assess each likely socio-economic effect is detailed in Table 17-22, along with the proposed impact area for each effect.

Table 17-22: Proposed Methodology for Assessing Socio-economic Effects

| Effect                                                           | Methodology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Impact Area                                                                                   |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Creation of Jobs and Employment                                  | <p>The number of direct jobs supported during the construction/decommissioning and operational phases of the Proposed Development will be provided by the Applicant and/or project transport consultant.</p> <p>The indirect effects will be based upon information by the Applicant, where possible. Where detail is not available, methodologies sourced from HM Treasury's Green Book (2022) and Homes England's (formerly the Homes &amp; Communities Agency) Additionality Guide will be applied, where relevant.</p> <p>Effects will therefore be largely quantitative, and supplemented with qualitative analysis, where necessary.</p> | Local Planning Authorities (ESC, GYBC, MSDC and SNDC) and Counties (Suffolk and Norfolk).     |
| Impact on Skills and the Labour Market                           | Indicative occupation/role profiles for the Proposed Development's workforce will be outlined using information provided by the Applicant and/or through reference to other schemes providing similar uses. A qualitative assessment will then be made for the potential of the Proposed Development to support a skilled workforce. The potential for new opportunities in respect of education, training and skills (including apprenticeships) will be set out qualitatively using information provided by the Applicant.                                                                                                                   | Local Planning Authorities (ESC, GYBC, MSDC and SNDC) and Counties (Suffolk and Norfolk).     |
| Impact on Local Businesses (terrestrial and maritime businesses) | <p>Businesses (terrestrial) will be identified using data from a combination of sources including Landstack, CoStar and an internet search. Maritime businesses will be identified through reference to a Navigation Impact Assessment.</p> <p>Effects on existing businesses (terrestrial and maritime) during the Proposed Development's construction/decommissioning phases will predominantly be assessed qualitatively, drawing on the findings of other technical assessments such as traffic and access, landscape and visual, noise and vibration and the Navigation Impact Assessment (should</p>                                     | Hyper local (500m radius from the Order Limits) and Local (2km radius from the Order Limits). |

| Effect            | Methodology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Impact Area                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
|                   | <p>the final design of the Proposed Development include Option 1 of the LSO component). Findings obtained from community consultation activities with local stakeholders will also be incorporated, where available.</p> <p>Quantitative assessment will be made with regards to the additional spend that could be generated by the Proposed Development's workforce through application of convenience goods expenditure per person sourced from Experian.</p> <p>Effects on local business water users from the provision of a direct water supply will be assessed qualitatively.</p>             |                                                                                               |
| Impact on Tourism | <p>Tourist attractions will be identified using data from a combination of sources including Landstack, Visit Britain and an internet search.</p> <p>Effects on tourism will be qualitatively assessed drawing on the findings of other technical assessments such as traffic and access, landscape and visual, noise and vibration and the Navigation Impact Assessment (should the final design of the Proposed Development include Option 1 of the LSO component). Findings obtained from community consultation activities with local stakeholders will also be incorporated where available.</p> | Hyper local (500m radius from the Order Limits) and Local (2km radius from the Order Limits). |

## Sensitivity of Receptors

17.8.4 Table 17-23 below sets out the proposed approach to assessing the sensitivity of receptors in the assessment.

Table 17-23: Socio-economic Receptor Sensitivity Descriptors

| Sensitivity | Criteria                                                                                                                                                                                                                                                                                                                                                                         |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High        | Receptor is likely to experience direct and significant socio-economic challenges with fundamental change to present characteristics. Accorded a high priority in local, regional, or national economic regeneration policy. Receptor is of regional or national importance. The receptor has no capacity to absorb change without fundamentally altering its present character. |
| Medium      | Receptor is likely to experience some socio-economic challenges, which may be indirect, but will materially change its present characteristics. Change relating to receptor has medium priority in local, regional, and national economic and regeneration policy. The receptor has limited capacity to absorb change without fundamentally altering its present character.      |
| Low         | Minor socio-economic challenges relating to receptor resulting in non-material changes to baseline conditions. Receptor is accorded a low priority in local, regional, and national economic and regeneration policy. Receptor is of low importance. The receptor has moderate capacity to absorb change without fundamentally altering its present character.                   |
| Very Low    | Receptor is able to absorb change without any alteration to its status or function and is of no importance to the local, regional or national economy. The receptor is tolerant of change without detriment to its present character.                                                                                                                                            |

## Magnitude of Impact

17.8.5 Table 17-24 below sets out the proposed approach to assessing the magnitude of impact in the assessment.

Table 17-24: Socio-economic Magnitude of Impact Descriptors

| Magnitude | Description of Impact                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High      | The impact will likely affect a large number of people, businesses or groups and/ or will materially change the existing baseline. Where quantifiable, the Proposed Development would cause a large change to the existing socio-economic condition (providing a 2.5% or greater change to the current baseline). Where not quantifiable (e.g. skills levels), this will be assessed using professional judgement. |
| Medium    | The impact will likely affect a moderate number of people, businesses or groups and/or will materially change the existing                                                                                                                                                                                                                                                                                         |

| Magnitude | Description of Impact                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | baseline. Where quantifiable, the Proposed Development would cause a moderate change to the existing socio-economic condition (providing between a 1% and 2.4% change to the current baseline). Where not quantifiable (e.g. skills levels), this will be assessed using professional judgement.                                                                                                                                                         |
| Low       | The impact will likely affect a small number of people, businesses or groups and/or the post-development characteristics will be similar to the existing baseline. Where quantifiable, the Proposed Development would cause a small change to the existing socio-economic condition (providing between a 0.1% and 0.9% change to the current baseline). Where not quantifiable (e.g. skills levels), this will be assessed using professional judgement. |
| Very Low  | The impact will likely affect a very small number of people, businesses or groups and/or the post-development characteristics will result in no discernible change to the existing baseline. Where quantifiable, the Proposed Development would provide less than 0.1% change to the current baseline). Where not quantifiable (e.g. skills levels), this will be assessed using professional judgement.                                                 |

## Effect Significance

- 17.8.6 The evaluation of socio-economic effects will be undertaken having regard to the sensitivity of the receptor (outlined in Table 17-23) and the magnitude of impact (outlined in Table 17-24). The significance would be derived using the matrix set out in chapter 3 EIA methodology of this Scoping Report. This may be supplemented/informed by professional judgement, which, where used, would be explained to give the rationale behind the values assigned. Significant effects, in the context of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) [16], would be effects of moderate or major significance.
- 17.8.7 Those effects classified as moderate or major beneficial/adverse will be considered as significant and, where effects are established as significant adverse, appropriate mitigation measures will be identified to inform the assessment of residual effects.



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## In-combination Effects

- 17.8.8 There is the potential for socio-economic in-combination effects with traffic and access, noise and landscape and visual. The in-combination effects are related to amenity value on tourism and business receptors. Any in-combination effects will be assessed within the socio-economics chapter of the ES.
- 17.8.9 As set out in chapter 3 EIA methodology, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within the cumulative effects assessment chapter the ES.

## Limitations and Assumptions

- 17.8.10 The socio-economic baseline is dependent on published data sources. Each data source has methodological limitations related to data collection and only represents the socio-economic context at a specific point in time.
- 17.8.11 The Broads Authority does not represent a standalone administrative geography for the baseline datasets used within the socio-economic assessment. Relevant population and labour market baseline data are therefore captured through the underlying local authority areas and supplemented by smaller-area analysis where appropriate.
- 17.8.12 Any changes to the existing hydrological regime on watercourses during the operational phase of the Proposed Development are not expected to result in likely significant effects on sensitive socio-economic receptors.
- 17.8.13 The assessment of likely significant effects in the socio-economics chapter of the ES will assess the maximum parameters and ‘cautious ‘worst case’ in line with the principle of the ‘Rochdale Envelope’ as set out in Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026) [17].

## 17.9 Summary of Impacts and Effects

- 17.9.1 Table 17-25 provides a summary of the socio-economic receptors, potential effects, anticipated magnitude, sensitivity and whether the receptor/effect is



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scoped into or out of the assessment for the construction, operational and decommissioning phases of the Proposed Development.

Table 17-25: Summary of Socio-economics Scope

| Receptor                                                   | Effects                                                                                                             | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures           | Scoped in/ Scoped out |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|--------------------------------------|-----------------------|
| <b>Construction Phase</b>                                  |                                                                                                                     |                       |                                     |                                                |                                      |                       |
| Jobs and Employment                                        | Creation of jobs and employment opportunities for local people and wider supply chain.                              | High                  | Medium                              | Significant (beneficial)                       | None required.                       | Scoped in             |
| Skills and the Labour Market                               | Opportunity to upskill the local workforce, enhancing the local labour market.                                      | Medium                | Medium                              | Significant (beneficial)                       | None required.                       | Scoped in             |
| Business Enterprises (Terrestrial and Maritime Businesses) | Potential disruption and adverse effect on existing businesses from construction activities. Beneficial impacts for | High - Low            | Medium                              | Significant (beneficial/adverse)               | Not yet known at this scoping stage. | Scoped in             |

| Receptor                 | Effects                                                                                                                                                                  | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                   | Scoped in/ Scoped out |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|--------------------------------------------------------------|-----------------------|
|                          | some business types via spend from construction workforce.                                                                                                               |                       |                                     |                                                |                                                              |                       |
| Tourism                  | Potential disruption and adverse effect on tourist facilities and visitor numbers from reduced amenity value and reduced availability in temporary accommodation market. | High-Low              | Medium                              | Significant (adverse)                          | To be informed by findings from other technical assessments. | Scoped in             |
| <b>Operational Phase</b> |                                                                                                                                                                          |                       |                                     |                                                |                                                              |                       |
| Jobs and Employment      | Creation of jobs and employment opportunities for local people and wider supply chain                                                                                    | Low                   | Medium                              | Not significant                                | None required.                                               | Scoped out            |

| Receptor                           | Effects                                                                                                      | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures           | Scoped in/ Scoped out |
|------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|--------------------------------------|-----------------------|
| Skills and the Labour Market       | Opportunity to upskill the local workforce, enhancing the local labour market                                | Low                   | Medium                              | Not significant                                | None required.                       | Scoped out            |
| Business Enterprises (Terrestrial) | Beneficial effects to local business water users from the provision of a direct water supply.                | Medium-High           | Medium                              | Significant (beneficial)                       | None required.                       | Scoped in             |
| Business Enterprises (Maritime)    | Potential disruption to maritime business operations.                                                        | Low                   | Medium                              | Not significant                                | Not yet known at this scoping stage. | Scoped out            |
| Tourism                            | Potential disruption and adverse effect on tourist facilities and visitor numbers from reduced amenity value | Low                   | Medium                              | Not significant                                | None required.                       | Scoped out            |

| Receptor                                                   | Effects                                                                                                                                           | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                 | Scoped in/ Scoped out |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Decommissioning Phase</b>                               |                                                                                                                                                   |                       |                                     |                                                |                                                                                                                                                                            |                       |
| Jobs and Employment                                        | Creation of jobs and employment opportunities for local people and wider supply chain.                                                            | High                  | Medium                              | Significant (beneficial)                       | None required.                                                                                                                                                             | Scoped in             |
| Skills and the Labour Market                               | Opportunity to upskill the local workforce, enhancing the local labour market.                                                                    | Medium                | Medium                              | Significant (beneficial)                       | None required.                                                                                                                                                             | Scoped in             |
| Business Enterprises (Terrestrial and Maritime Businesses) | Potential disruption and adverse effect on existing businesses from construction activities. Beneficial impacts for some business types via spend | High-Low              | Medium                              | Significant (beneficial/adverse)               | Mitigation measures will be developed through a DEMP, in accordance with the ODEMP, to minimise disruption to terrestrial and maritime businesses through decommissioning. | Scoped in             |

| Receptor | Effects                                                                                                                                                                  | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                               | Scoped in/ Scoped out |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|          | from construction workforce.                                                                                                                                             |                       |                                     |                                                |                                                                                                                                                                                                                                          |                       |
| Tourism  | Potential disruption and adverse effect on tourist facilities and visitor numbers from reduced amenity value and reduced availability in temporary accommodation market. | High-Low              | Medium                              | Significant (adverse)                          | Mitigation measures will be informed by findings from other technical assessments and implemented through a DEMP, in accordance with the ODEMP, to minimise disruption to tourism assets and visitor activities through decommissioning. | Scoped in             |

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## 18 Human Health

### 18.1 Introduction

- 18.1.1 This chapter outlines the proposed approach for assessing the likely significant effects of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on human health throughout its construction, operational, and decommissioning phases. The findings of this assessment will be presented within the Environmental Statement (‘ES’), which will be submitted as part of the application for a Development Consent Order (‘DCO’).
- 18.1.2 The chapter sets out the methodology to be applied in identifying and evaluating potential effects on human health, including the data sources that will inform the assessment and a description of existing baseline conditions. It also defines the scope of the assessment by identifying the potentially significant effects to be considered and explains the approach that will be used to assess their significance.
- 18.1.3 The EIA Scoping Area is shown on Figure 1-1. Several disciplines will inform the human health assessment. This chapter should be read in conjunction with the following chapters of the Scoping Report:
- Chapter 2 The Proposed Development.
  - Chapter 3 EIA Methodology.
  - Chapter 9 Water Environment.
  - Chapter 10 Landscape and Visual.
  - Chapter 13 Traffic and Access.
  - Chapter 14 Noise and Vibration.
  - Chapter 15 Air Quality and Odour.
  - Chapter 17 Socio-economics.
- 18.1.4 The human health assessment will follow published guidance from the Institute of Sustainability and Environmental Professionals (‘ISEP’) (formerly the Institute of Environmental Management and Assessment (‘IEMA’)). This guidance includes the Effective Scoping of Human Health in Environmental

Impact Assessment [1] and Determining Significance for Human Health in Environmental Impact Assessment [2] (together comprising the ‘ISEP Guidance’), both published in 2022. The ISEP Guidance sets out established approaches for identifying, scoping, and evaluating potential health impacts within an Environmental Impact Assessment (‘EIA’).

- 18.1.5 The ISEP Guidance recommends considering the following categories and associated wider determinants of health during scoping:

Table 18-1: EIA Wider Determinants of Health to Scope (not exhaustive)

| Categories                          | Wider Determinants of Health                          |
|-------------------------------------|-------------------------------------------------------|
| Health related behaviours           | Physical activity                                     |
|                                     | Risk taking behaviour                                 |
|                                     | Diet and nutrition                                    |
| Social environment                  | Housing                                               |
|                                     | Relocation                                            |
|                                     | Open space, leisure and play                          |
|                                     | Transport modes, access and connections               |
|                                     | Community safety                                      |
|                                     | Community identity, culture, resilience and influence |
| Economic environment                | Social participation, interaction and support         |
|                                     | Education and training                                |
| Bio-physical environment            | Employment and income                                 |
|                                     | Climate change mitigation and adaptation              |
|                                     | Air quality                                           |
|                                     | Water quality or availability                         |
|                                     | Land quality                                          |
|                                     | Noise and vibration                                   |
| Institutional and built environment | Radiation                                             |
|                                     | Health and social care services                       |
|                                     | Built environment                                     |
|                                     | Wider societal infrastructure and resources           |



18.1.6 The assessor for the human health assessment has 10 years' experience of assessing the human health, equalities and social value impacts of projects consented under the requirements of the EIA Regulations (including The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [3]) for the Town and Country Planning Act 1990 (as amended) and Planning Act 2008 consenting regimes, including for major residential, mixed-use and infrastructure development.

## 18.2 Study Area

- 18.2.1 The ISEP Guidance for scoping human health assessments in EIA recognises that the geographic scope varies by topic and may require a range of study areas. These areas should be determined *'to identify where there are likely and potentially significant EIA Scoping Area and local area effects that differ from wider effects and focus on areas where the project would influence most'*.
- 18.2.2 Professional judgement has been applied to select appropriate study areas. This will ensure that the assessment in the human health chapter of the ES retains relevance and proportionality to the populations considered, including vulnerable receptors that are most likely to be affected by the Proposed Development, whilst encompassing the scale of the activities during its construction, operational and decommissioning phases.
- 18.2.3 Two complementary study areas have been defined for the human health assessment, providing both a broad overview and a more detailed, location-specific analysis of potential effects:
- **Health Study Area:** This study area has been defined to establish the population and health baseline for communities in proximity to the Proposed Development across the whole EIA Scoping Area. Given the extent of the EIA Scoping Area, it encompasses four Local Planning Authorities ('LPAs') within which it is located, comprising East Suffolk Council ('ESC'), Great Yarmouth Borough Council ('GYBC'), Mid Suffolk District Council ('MSDC'), and South Norfolk District Council ('SNDC'). The health study area is shown in Figure 18-2.
  - **Residential and Community Receptor Study Area(s):** The ISEP Guidance recognises that the geographic scope of assessment may vary by health determinant, and that different study areas may be used

to identify locations where likely significant local effects may differ from wider effects. Accordingly, a series of smaller, localised study areas have been defined to identify residential and community receptors most likely to be affected by specific components of the Proposed Development (refer to Figure 1-3):

- Proposed Advanced Water Recycling Plant ('AWRP').
- Proposed Long Sea Outfall ('LSO').
- Proposed Central Service Reservoir ('CSR').
- Proposed Western Service Reservoir ('WSR').
- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
- Proposed CSR to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline.
- Proposed Western Distribution Mains.
- Proposed Eastern Distribution Mains.

18.2.4 The residential and community receptor study areas enable a more detailed understanding of local population characteristics and vulnerabilities. Their extent varies depending on the scale and location of the proposed component, as well as surrounding land uses. While a strategic health study area is used to establish the overall population and health context across the Proposed Development, which extends across four districts, the component specific study areas provide a more localised understanding of population characteristics, health determinants and community assets, helping to identify how effects may be experienced differently along the route.

18.2.5 Given the linear nature of the Proposed Development, potential health effects are unlikely to be experienced uniformly across the EIA Scoping Area. Localised study areas therefore provide a proportionate means of understanding how exposure pathways, population characteristics and the distribution of receptors and key community facilities vary across the route, enabling the assessment to identify where effects may be concentrated and whether any population groups could experience disproportionate effects.

18.2.6 The defined residential and community receptor study areas are:

- The proposed AWRP study area: 2km radius from the proposed AWRP section of the EIA Scoping Area.
- The proposed LSO study area: 2km radius from the proposed LSO (comprising three options) section of the EIA Scoping Area.
- The proposed CSR study area: 2km radius from the proposed CSR section of the EIA Scoping Area.
- The proposed WSR study area: 2km radius from the proposed WSR section of the EIA Scoping Area.
- The proposed AWRP to River Waveney Pipeline study area: 500m radius from the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area.
- The proposed Barsham WTW to CSR Pipeline study area: 500m radius from the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area.
- The proposed CSR to WSR Pipeline study area: 500m radius from the proposed CSR to WSR Pipeline section of the EIA Scoping Area.
- The proposed CSR to Saxmundham Pipeline study area: 500m radius from the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area.
- The proposed Saxmundham to SZC Pipeline study area: 500m radius from the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area.
- The proposed Eastern and Western Distribution Mains study areas: 500m radius from the proposed Distribution Mains sections of the EIA Scoping Area.

18.2.7 The above residential and community receptor study areas support the assessment of population and human health effects by identifying the communities and health determinants most likely to be affected. Study areas have been defined using professional judgement in line with National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 112 – Population and Human Health (2020) [4] (the 'DMRB LA 112 Guidance'). Whilst the Design Manual for Roads and Bridges ('DMRB') was prepared for highways schemes, it is a widely adopted methodology for the assessment of impacts upon human health for other types of projects. The DMRB LA 112 Guidance recommends a 500m area around a project's boundary, with this adjusted where effects are expected to extend further or be more limited. Accordingly, a 500m study area has been applied to the

pipeline sections of the EIA Scoping Area, where potential effects are expected to be more localised and primarily associated with the construction corridor. A wider 2km study area has been adopted for the above-ground components' sections of the EIA Scoping Area to capture potentially wider-reaching effects, reflecting the potential for these elements to give rise to broader environmental, accessibility and community-related pathways relevant to human health including traffic movement and access to community and recreational assets. The 2km study area is therefore considered a proportionate and precautionary extension of the DMRB approach, informed by professional judgement and the potential extent of direct and indirect health-related effects.

- 18.2.8 For the purposes of the human health assessment, receptor groups comprise populations or sub-populations whose health and wellbeing may be influenced by the Proposed Development. These groups are identified using demographic, socio-economic and health baseline data and may include children and young people, older people, people with existing health conditions, and communities experiencing socio-economic disadvantage or health inequalities who may exhibit greater sensitivity to changes in environmental, social or economic determinants of health. Whilst population groups remain the primary receptors within the assessment, localised residential and community receptor study areas are used to better understand the characteristics, vulnerabilities, distribution and exposure pathways of these receptor groups across the route corridor. The localised study areas also identify the health determinants and community assets that support health and wellbeing, including schools, healthcare facilities, community facilities, recreational assets, public rights of way and areas of public open space, enabling the assessment to identify where effects may be concentrated and whether any population groups could experience differential or disproportionate effects.
- 18.2.9 The residential and community study areas have also been aligned with those used in the relevant technical topic chapters of this Scoping Report, including chapter 9 water environment, chapter 10 landscape and visual,

chapter 13 traffic and access, chapter 14 noise and vibration, and chapter 15 air quality and odour, where appropriate. Where differences occur, these reflect the determinant-led approach to human health and are considered proportionate to the pathways being assessed.

- 18.2.10 The study areas will be refined throughout the evolution of the Proposed Development. However, it is anticipated that the study areas for the ES will be the proposed Order Limits plus the same radii as described above.
- 18.2.11 Appendix 18.1 to this chapter sets out the legislation, policy and guidance relevant to human health. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES. The proposed scope and methodology have had regard to the relevant national, regional and local policy and guidance identified within Appendix 18.1.

### 18.3 Consultation and Engagement

- 18.3.1 Engagement and consultation regarding human health will be undertaken as part of the wider EIA consultation process for the Proposed Development.
- 18.3.2 Given the scale of the Proposed Development, non-statutory engagement is intended to be pursued with the relevant NHS Integrated Care Boards as part of the engagement and consultation process in order to determine any potential impacts to service delivery, particularly regarding potential impacts on emergency services, any healthcare workforce needs identified within the EIA Scoping Area, and any primary or secondary healthcare needs.
- 18.3.3 No formal engagement in relation to human health assessment has been undertaken to date regarding the ES. However, feedback received during the non-statutory consultation process has informed the wider ES and the identification of relevant health pathways. This included a virtual meeting with the Marine Management Organisation held on 23 June 2026, which highlighted the potential scoping in of maritime navigation impacts associated with the LSO component of the Proposed Development into the assessment in the human health chapter of the ES. Although maritime

navigation is not a health determinant as such, temporary changes to navigation routes, access restrictions and increased vessel movements during construction could influence health and wellbeing through recognised determinants, particularly access to blue space, leisure and recreation opportunities, physical activity, and perceptions of safety. Potential maritime navigation impacts relevant to human health therefore include reduced opportunities for physical activity, relaxation and social interaction, together with changes in the perceived safety, accessibility and enjoyment of the marine environment.

- 18.3.4 Engagement with relevant stakeholders will continue throughout the EIA process, where appropriate.

## 18.4 Baseline Environment

- 18.4.1 The baseline environment has been established for the health study area and the component specific study areas defined above in Section 18.2.

### Baseline Data Sources

- 18.4.2 Baseline conditions have been established by carrying out a desk-based study of the study areas using information collected from the following sources:

- Office for National Statistics Census, 2021 [5].
- Office for Health Improvement and Disparities Local Health Authority Profiles [6].
- Office for Health Improvement and Disparities Local Health, Public Health Data for Small Geographic Areas [7].
- English Indices of Multiple Deprivation, 2025 [8].
- Sport England – Active Lives Survey [9].
- Natural England Green Infrastructure Framework (2025) [10].
- Department for Environment, Food and Rural Affairs Access to Green Space in England (2024) [11].
- Relevant local data sources (e.g. Joint Strategic Needs Assessments).
- Ordnance Survey based address data (most recent update).
- Green Space Index 2025 [12].

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## Baseline Environment in the Health Study Area

- 18.4.3 A baseline has been established using demographic and health profile data for the health study area. This provides an overview of population characteristics, health outcomes and community lifestyle and environment conditions, helping to identify key sensitivities across the wider area and understand the health determinants that may be influenced by the Proposed Development.
- 18.4.4 The health study area has been assessed against relevant comparators, including regional (East of England) and national (England) benchmarks, where appropriate.

### Population Characteristics

#### *Population Overview*

- 18.4.5 According to the Census for England and Wales (2021), the health study area has an estimated resident population of 590,449, while the wider East of England region (within which the study area is located) has a population of 6,335,074.

#### *Age*

- 18.4.6 Within the health study area, 58.1% of the population are of working age (16-64), which is notably lower than the national (63%) average and slightly lower than the regional (61.6%) average.
- 18.4.7 Additionally, the health study area reports a lower population of children (0-15) (16.6%) compared to the regional (18.7%) and national (18.5%) averages. Correspondingly, the health study area identifies a higher proportion of population ages over 64 years old at 25.4%. This is markedly higher than the regional (19.6%) and national (18.3%) averages.
- 18.4.8 In general, the four LPAs report very similar population age structures. However, the ESC area records a notably higher proportion of residents aged over 64 (27.8%) compared to the other three LPAs.



### *Ethnicity and Religion*

- 18.4.9 Ethnicity and religion are included in the population profile as they help identify communities with specific social, cultural and community needs that may influence health and wellbeing. The leading ethnicity in the health study area is White, accounting for 95.8% of the population. This is also the predominant group at the regional (86.5%) and national (81%) levels. The second most common ethnicity reported in the health study area is Asian (1.5%) and similarly, 1.5% of the population in the health study area identify as Mixed or Multiple Ethnicities. Despite the health study area reporting 1.5% of the population as identifying as Asian, within the MSDC area, a notably lower percentage (0.8%) identify as Asian.
- 18.4.10 Christianity is the leading religion in the health study area, with 47.6% of the population identifying as Christian. This is generally aligned with the regional (46.6%) and national (46.3%) levels. There is a higher percentage of people identifying with 'No Religion' (44.5%) compared to the regional (40.2%) and national (36.7%) averages. Consequently, the percentage of people identifying with other religions within the health study area is generally lower than both regional and national levels. Further details are provided in Table 18-2 below.

Table 18-2: Religion Distribution by Area

| Religion       | Health Study Area | East of England | England |
|----------------|-------------------|-----------------|---------|
| No religion    | 44.5%             | 40.2%           | 46.3%   |
| Christian      | 47.6%             | 46.6%           | 46.3%   |
| Buddhist       | 0.3%              | 0.4%            | 0.5%    |
| Hindu          | 0.3%              | 1.4%            | 1.8%    |
| Jewish         | 0.1%              | 0.7%            | 0.5%    |
| Muslim         | 0.5%              | 3.7%            | 6.7%    |
| Sikh           | 0.0%              | 0.4%            | 0.9%    |
| Other Religion | 0.5%              | 0.6%            | 0.6%    |
| Not Answered   | 6.1%              | 6.1%            | 6.0%    |



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*Disability*

- 18.4.11 In the health study area, 19.5% of the population is classified as disabled under the Equality Act 2010 [13]. This is marginally higher than both the regional (16.6%) and national (17.3%) averages. Notably, ESC and GYBC report higher percentages at 20.6% and 22.6% respectively. Of those classified as disabled under the Equality Act 2010 in GYBC, 10.2% find their day-to-day activities are limited a lot. This is higher than ESC (8.5%), MSDC (6.4%), SNDC (6.8%), and the regional (6.6%) and national (7.3%) averages.
- 18.4.12 The health study area reports that 80.5% of the population is not classified as disabled under the Equality Act 2010. However, 8% of population in the health study area who are not classified as disabled experience a long term physical or mental health condition. This is slightly higher than the regional (7.2%) and national (6.8%) averages.

*Population Projection*

- 18.4.13 Overall, the health study area is anticipated to experience a 3.87% population increase from 620,387 in 2026 to 643,945 in 2031. For comparison, the East of England region is expected to increase by 2.6% and nationally, the population is projected to increase by 2.28%.
- 18.4.14 Population growth within the health study area is not evenly distributed across age cohorts, with growth concentrated in those aged over 65. The over 65 demographic of the population is anticipated to increase by 12.03% from 2026 to 2031. This is generally in line with the regional and national levels, whereby this demographic is expected to experience a 10.48% and 10.6% increase, respectively.
- 18.4.15 The health study area is anticipated to experience a decrease in population aged between 0 and 15 years old (-3.67%) from 2026 to 2031. This is aligned with the projected figures regionally (-3.6%) and nationally (-4.6%). However, this trend is not uniform across the LPAs, with the ESC and GYBC areas forecasted to experience greater decreases (6.4% and 7%,

respectively) compared to the relatively minor declines anticipated in the MSDC and SNDC areas (0.35% and 0.93%, respectively).

### Deprivation ('IoD')

18.4.16 The Indices of Deprivation ('IoD') 2025 is published by the Ministry of Housing, Communities and Local Government [14] and provides a relative measure of deprivation for areas in England. The IoD provides local authority summaries of deprivation, ranking all 317 local authorities in England from the most deprived (rank 1) to the least deprived (rank 317).

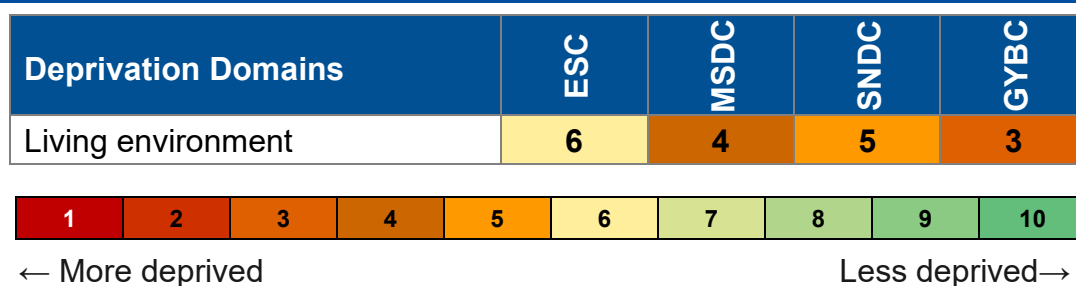
18.4.17 The LPAs within the health study area are ranked as follows:

- ESC - average ranked 138 out of 317 authorities, making it more deprived than 60% of authorities nationally.
- MSDC - average ranked 191 out of 317 authorities, making it less deprived than 60% of authorities nationally.
- SNDC - average ranked 220 out of 317 authorities, making it less deprived than 70% of authorities nationally.
- GYBC - average ranked 25 out of 317 authorities, making it more deprived than 90% of authorities nationally.

18.4.18 Further details of the deprivation levels of the health study area are outlined in Table 18-3 below. Deprivation domains at the local authority level are presented using national rank data (1-317, where 1 represents the most deprived). To enable easier understanding of the data presented, these ranks have been converted into approximate deciles, aligning with the standard IMD scale (1 = most deprived to 10 = least deprived).

Table 18-3: Indices of Multiple Deprivation for the Health Study Area by deprivation domain

| Deprivation Domains              | ESC | MSDC | SNDC | GYBC |
|----------------------------------|-----|------|------|------|
| Income                           | 6   | 8    | 8    | 2    |
| Employment                       | 5   | 8    | 7    | 1    |
| Education, skills and training   | 3   | 6    | 6    | 1    |
| Health and disability            | 5   | 8    | 8    | 2    |
| Crime                            | 8   | 10   | 9    | 3    |
| Barriers to housing and services | 4   | 1    | 3    | 4    |



18.4.19 Overall, the data highlights clear variation in deprivation across the health study area, with GYBC consistently experiencing higher levels of deprivation across several domains, while MSDC and SNDC generally fall within less deprived deciles nationally. ESC typically occupies a mid-range position. Further detail on the spatial distribution of deprivation across the study area is presented in Figure 18-3, which illustrates deprivation at the Lower Layer Super Output Area ('LSOA') level.

### Health Outcomes

#### Overall General Health

18.4.20 In the health study area, 80.3% of the population self-reported having either 'good' (35.9%) or 'very good' (44.4%) health. This is generally in line with regional (82.9%) and national (82.2%) averages.

18.4.21 One LPA within the health study area, GYBC, self-reports notably worse health compared to the other authority areas. Of GYBC's population, 7.2% self-identify as having 'bad' (5.6%) or 'very bad' (1.6%) health. This is higher than regional (4.6%) and national (5.2%) averages. Correspondingly, only 76.1% of the population identify as having 'good' (35.9%) or 'very good' (40.2%) health.

#### Physical Health Characteristics

18.4.22 As shown in Table 18-4 below, the health study area typically performs in line with or better than the regional and national averages across key physical health indicators. Notably, however, GYBC demonstrates generally worse statistics compared to the other LPAs, the East of England region and England.

18.4.23 There is only one key health determinant whereby the health study area higher rates than the regional and national average (under 75 mortality rate from cancer).

Table 18-4: Physical Health Characteristics

| Indicator                                                                                       | Year    | ESC   | MSDC  | SNDC  | GYBC  | East of England | England |
|-------------------------------------------------------------------------------------------------|---------|-------|-------|-------|-------|-----------------|---------|
| <b>Life Expectancy</b>                                                                          |         |       |       |       |       |                 |         |
| Life expectancy at birth for males (years)                                                      | 2025    | 81.3  | 82.6  | 81.5  | 79.2  | 80.7            | 80.0    |
| Life expectancy at birth for females (years)                                                    | 2025    | 84.7  | 85.7  | 85.2  | 82.1  | 84.4            | 83.8    |
| <b>Morbidity</b>                                                                                |         |       |       |       |       |                 |         |
| Hip fractures in people aged 65 and over (per 100,000 population aged 65 and over)              | 2024/25 | 468   | 438   | 450   | 459   | 537             | 536     |
| <b>Mortality</b>                                                                                |         |       |       |       |       |                 |         |
| Under 75 mortality rate: all causes                                                             | 2025    | 278.6 | 233.6 | 258.3 | 393.0 | 291.1           | 321     |
| Under 75 mortality rate from all cardiovascular diseases (per 100,000 population aged under 75) | 2025    | 62.8  | 47.5  | 50.2  | 76.2  | 62.3            | 71.5    |
| Under 75 mortality rate from cancer                                                             | 2025    | 114.9 | 104.2 | 108.3 | 149.8 | 109.1           | 114.6   |

| Indicator                              | Year | ESC | MSDC                            | SNDC | GYBC | East of England | England |
|----------------------------------------|------|-----|---------------------------------|------|------|-----------------|---------|
| (per 100,000 population aged under 75) |      |     |                                 |      |      |                 |         |
| <b>Key</b>                             |      |     |                                 |      |      |                 |         |
|                                        |      |     | Better than the England average |      |      |                 |         |
|                                        |      |     | Similar to the England average  |      |      |                 |         |
|                                        |      |     | Worse than the England average  |      |      |                 |         |
|                                        |      |     | Not Compared                    |      |      |                 |         |

### *Mental Health and Behavioural Risk Factors*

- 18.4.24 In contrast to the physical health characteristics, the health study area typically reports worse mental health and behavioural risk indicators compared to regional and national averages. Rates of hospital admission for intentional self-harm are higher than both benchmarks. Dementia diagnosis rates are also above regional and national averages, indicating a greater prevalence of cognitive health conditions within the study area.
- 18.4.25 The health study area reports a lower prevalence of obesity among Year 6 children (aged 10-11 years) compared with the regional and national averages. However, GYBC identifies a higher percentage than the comparators. Similar to physical health characteristics, GYBC generally experiences worse mental health and behavioural risk factors compared to the other LPAs and the regional and national averages.
- 18.4.26 Further details are provided in Table 18-5 below.

Table 18-5: Mental Health and Behavioural Risk Factors

| Indicator                                                                            | Year          | ESC   | MSDC  | SNDC  | GYBC  | East of England | England |
|--------------------------------------------------------------------------------------|---------------|-------|-------|-------|-------|-----------------|---------|
| <b>Mental Health</b>                                                                 |               |       |       |       |       |                 |         |
| Emergency hospital admission rate for intentional self-harm (per 100,000 population) | 2023/24       | 181.7 | 117.6 | 106.5 | 155.3 | 108.1           | 117.0   |
| Suicide rate (per 100,000 population aged 10 and over)                               | 2022-2024     | 12.2  | 9.8   | 12.0  | 11.4  | 10.0            | 10.9    |
| Estimated dementia diagnosis rate (65+ years) (%)                                    | 2025          | 57.6% | 49.8% | 53.1% | 70.9% | 63.9%           | 65.6%   |
| <b>Lifestyle</b>                                                                     |               |       |       |       |       |                 |         |
| Percentage of physically active adults                                               | 2024/25       | 73.8% | 68.2% | 71.3% | 62.8% | 68.3%           | 68.0%   |
| Percentage of overweight or obese adults                                             | 2024/25       | 70.2% | 62.6% | 71.2% | 69.2% | 65.2%           | 64.6%   |
| Percentage of obesity in Year 6 children                                             | 2024/25       | 20.4% | 16.3% | 17.9% | 25.4% | 20.3%           | 22.2%   |
| Smoking prevalence in adults (%)                                                     | 2024          | 11.6% | 10.8% | 6.9%  | 8.4%  | 9.7%            | 10.4%   |
| Hospital admission rate for alcohol-related conditions (under 18                     | 2021/22-23/24 | 28.5  | 17.4  | 15.2  | 34.7  | 19.6            | 22.6    |

| Indicator                       | Year                            | ESC | MSDC | SNDC | GYBC | East of England | England |
|---------------------------------|---------------------------------|-----|------|------|------|-----------------|---------|
| years) (per 100,000 population) |                                 |     |      |      |      |                 |         |
| <b>Key</b>                      |                                 |     |      |      |      |                 |         |
|                                 | Better than the England average |     |      |      |      |                 |         |
|                                 | Similar to the England average  |     |      |      |      |                 |         |
|                                 | Worse than the England average  |     |      |      |      |                 |         |
|                                 | Not Compared                    |     |      |      |      |                 |         |

Source: OHID.

18.4.27 These baseline characteristics indicate an ageing population with relatively higher levels of disability and specific localised health inequalities, particularly in GYBC. This suggests increased sensitivity to environmental impacts from a proposed development, including the Proposed Development.

## Community Lifestyle and Environment Conditions

### Physical Activity

18.4.28 Overall, physical activity in the health study area is aligned with the regional and national average. Within the health study area, 69.3% of the population meets the recommended 150 minutes of physical activity a week, compared to 69.3% in the region and 64.6% nationally.

18.4.29 Correspondingly, 24.8% of the health study area population is classified as inactive (reaching less than 30 minutes of physical activity a week). This is very similar to the regional (24.5%) and national (24.7%) levels. Notably, however, GYBC reports a higher level of inactivity (30.9%) compared to the other LPAs and wider comparators.

### Transport and Travel

18.4.30 According to the 2021 Census for England and Wales, 26.3% of residents within the health study area primarily work from home, noting that this figure

may not be representative of current and future working conditions due to the COVID-19 pandemic and the date of the Census survey. This figure is notably lower than regional (31.9%) and national (31.5%) averages. This is likely influenced by the inclusion of GYBC within the overall health study area, where a substantially lower proportion of residents (16.6%) work primarily from home, thereby reducing the overall average.

18.4.31 The most common method of travel to workplace in the health study area is driving a car or van (55.6%). This is higher than the regional (47.7%) and national (44.5%) averages. The second most common method of commuting in the health study area is on foot, with 7.1% of the population utilising this method, which is generally aligned with regional (7.3%) and national (7.9%) levels.

18.4.32 Use of public transport to commute is generally lower than regional (4.9%) and national (8.2%) levels in the health study area, at 2.4%. Uptake of public transport is more common in GYBC, whereby 4.7% utilise public infrastructure to commute.

### Green Infrastructure

18.4.33 The Green Space Index published by Fields in Trust [15] provides an overall measure of green space provision within an area, taking into account the extent, accessibility, and quality of available green infrastructure, and is used to benchmark how well communities are served by these spaces. Two key indicators which are used to determine green space provision in an area are provision per person in square metres ('sqm') and population not within a 10-minute walk of a green space. Table 18-6 below outlines the relevant scores for the health study area.

Table 18-6: Green Space Index Scoring

|      | Provision per Person<br>in sqm | Population Not Within<br>a 10-Minute Walk |
|------|--------------------------------|-------------------------------------------|
| ESC  | 34.18                          | 12.3%                                     |
| MSDC | 30.60                          | 23.6%                                     |
| SNDC | 32.19                          | 19.7%                                     |



|      | Provision per Person<br>in sqm | Population Not Within<br>a 10-Minute Walk |
|------|--------------------------------|-------------------------------------------|
| GYBC | 24.14                          | 9.7%                                      |

18.4.34 The Green Space Index is typically benchmarked against a minimum provision of 24sqm per person and the expectation that all residents should live within a 10-minute walk of green space. Within the health study area, provision generally exceeds or is close to the minimum threshold; however, accessibility varies, with between 9.7% and 23.6% of residents not meeting the 10-minute walk standard. MSDC and SNDC show comparatively poorer accessibility, while GYBC performs better despite marginal provision levels. Overall, while provision is generally at or above the minimum quantitative benchmark, accessibility remains constrained in several areas, meaning not all residents meet the 10-minute access standard.

#### *Economic Activity*

18.4.35 Of the population within the health study area aged 16 and over, 55.5% are economically active (excluding full-time students) and 53.2% are in employment. These figures are marginally lower than the regional (59.8% and 57.3%) and national (58.6% and 55.7%) averages.

18.4.36 Within the health study area, 43.1% of the usual residents aged 16 or over are economically inactive, which is higher than the regional (38.2%) and national (39.1%) levels. Of this total, 29.2% are retired, 3.2% are students, 4.3% are looking after home or family and 4% are long term sick or disabled.

18.4.37 Approximately 6.1% of usual residents aged 16 or over within GYBC are economically inactive due to long-term sickness or disability. This is notably higher than the regional (3.4%) and national (4.1%) averages. Further, only 48.7% of GYBC population is in employment, significantly lower than the established comparators.

### Industrial Profile

18.4.38 The leading industries within the health study area include human health and social work activities (totalling 15.9% of all employment); wholesale and retail trade (15%) and construction (9.5%). Further details on industry are outlined in Table 18-7 below.

Table 18-7: Workplace Employment % by Industry

| Industry                                                                | ESC  | MSDC | SNDC | GYBC | Health Study Area | East of England | England |
|-------------------------------------------------------------------------|------|------|------|------|-------------------|-----------------|---------|
| A: Agriculture, Forestry and fishing                                    | 1.9  | 3.4  | 2.7  | 1.0  | 2.3               | 1.0             | 0.8     |
| B: Mining and quarrying                                                 | 0.6  | 0.1  | 0.3  | 1.9  | 0.7               | 0.1             | 0.2     |
| C: Manufacturing                                                        | 7.2  | 7.7  | 7.5  | 8.9  | 7.8               | 7.0             | 7.3     |
| D: Electricity, gas, steam and air conditioning supply                  | 1.4  | 0.9  | 0.5  | 0.9  | 0.9               | 0.5             | 0.6     |
| E: Water supply; Sewerage, Waste management and Remediation activities  | 0.8  | 0.8  | 0.7  | 0.9  | 0.8               | 0.7             | 0.7     |
| F: Construction                                                         | 9.0  | 11.1 | 9.2  | 8.7  | 9.5               | 10.0            | 8.7     |
| G: Wholesale and retail trade; repair of motor vehicles and motorcycles | 15.1 | 14.4 | 13.5 | 16.8 | 15.0              | 15.0            | 15.0    |
| H: Transport and storage                                                | 6.9  | 5.1  | 3.4  | 4.4  | 5.0               | 5.3             | 5.0     |
| I: Accommodation and food service activities                            | 5.6  | 3.4  | 3.9  | 8.3  | 5.3               | 4.3             | 4.9     |

| Industry                                                         | ESC  | MSDC | SNDC | GYBC | Health Study Area | East of England | England |
|------------------------------------------------------------------|------|------|------|------|-------------------|-----------------|---------|
| J: Information and communication                                 | 3.6  | 3.5  | 3.1  | 1.6  | 3.0               | 4.6             | 4.7     |
| K: Financial and insurance activities                            | 2.6  | 3.3  | 4.5  | 1.7  | 3.0               | 4.4             | 3.8     |
| L: Real estate activities                                        | 1.3  | 1.2  | 1.8  | 1.1  | 1.4               | 1.6             | 1.6     |
| M: Professional, scientific and technical activities             | 5.0  | 6.7  | 6.6  | 3.7  | 5.5               | 6.8             | 6.7     |
| N: Administrative and support service activities                 | 5.2  | 5.3  | 4.8  | 5.3  | 5.2               | 5.4             | 5.3     |
| O: Public administration and defence; compulsory social security | 5.5  | 6.4  | 5.4  | 4.2  | 5.4               | 5.3             | 5.8     |
| P: Education                                                     | 8.6  | 8.8  | 10.7 | 7.4  | 8.9               | 9.8             | 9.9     |
| Q: Human health and social work activities                       | 14.7 | 13.2 | 16.9 | 18.6 | 15.9              | 13.7            | 14.6    |
| Arts, entertainment, recreation & other services                 | 5.0  | 4.6  | 4.5  | 4.7  | 4.7               | 4.5             | 4.6     |

### *Air Quality*

18.4.39 There are currently no declared Air Quality Management Areas ('AQMA's') within the health study area; however, localised variations in air quality may occur adjacent to major transport routes or industrial sources and will be considered within the assessment undertaken in the air quality and odour chapter of the ES.

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## Baseline Environment in the Residential and Community Receptor Study Areas

- 18.4.40 A baseline for the residential and community receptor study areas has been completed to understand nearby sensitivities related to key health factors that may be affected by the Proposed Development, as well as the specific population sensitivities and vulnerabilities associated with the different components of the Proposed Development. The distribution of key receptors and assets is shown in Figure 18-4 (Private Property and Housing), Figure 18-5 (Open Space, Leisure and Play), Figure 18-6 (Transport Modes, Access and Connections) and Figure 18-7 (Institutional and Built Environment).
- 18.4.41 Given the scale and nature of the Proposed Development, sensitivity ratings have been informed by environmental value (sensitivity) criteria set out in Table 3.11 of the DMRB LA 112 Guidance, with particular reference to changes in accessibility and severance affecting private property and housing and community land and assets. This guidance is intended to be applied to projects covering a wide geographic area and spanning multiple local authority boundaries and is considered appropriate for informing the assessment of likely significant effects at this scoping stage. The receptors and assets considered within the assessment are illustrated in Figures 18-4 to 18-6.
- 18.4.42 Preliminary sensitivity ratings are presented in the baseline, which are intended to provide an initial indication of the relative sensitivity of population groups and health determinants within each component study area. These ratings will be reviewed and updated as necessary at the ES stage, where a more detailed assessment of receptor sensitivity and likely significant effects will be undertaken in accordance with the ISEP Guidance's sensitivity guidance (presented in Section 18.8).

## Proposed AWRP

- 18.4.43 Table 18-8 summarises the key health determinants and population vulnerabilities within the proposed AWRP study area. The baseline

indicates that the proposed AWRP study area has a mixed sensitivity profile, with noise identified as the primary concern (high sensitivity) due to the presence of nearby residential and community receptors. Several factors show medium sensitivity, including community and education facilities, healthcare services, transport connectivity, and potential pollution pathways, reflecting the presence of vulnerable populations, key local services, and important transport routes that could be affected by environmental or traffic changes. In contrast, green space, air quality, and landscape amenity are considered low sensitivity, indicating relative resilience and fewer constraints. Overall, the findings highlight noise, accessibility, and environmental quality as the main areas requiring careful management.

Table 18-8: Proposed AWRP Study Area Preliminary Sensitivity to Changes in Health Determinants

| Key Health Factors                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities | <b>Medium</b>           | <p>The proposed study area is located on the outskirts of Hopton-on-Sea, with a number of community facilities within this study area, as well as at least 100 residential dwellings. Key receptors include:</p> <p>Education</p> <ul style="list-style-type: none"> <li>Hopton Church of England Primary School</li> </ul> <p>Community facilities</p> <ul style="list-style-type: none"> <li>Hopton-on-Sea Village Hall</li> <li>Lound Village Hall, Suffolk</li> </ul> <p>Places of worship</p> <ul style="list-style-type: none"> <li>St Margaret's Parish Church</li> <li>St John the Baptist's Church</li> </ul> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.</p> |

| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green/open space and recreational facilities | <b>Low</b>              | The proposed AWRP study area is located within the LSOAs: Great Yarmouth 010C, Great Yarmouth 013D, Great Yarmouth 013C, East Suffolk 001D and East Suffolk 001B. Great Yarmouth 013D and East Suffolk 001B have high levels of green space provision, exceeding the Fields in Trust benchmark. However, the remaining LSOAs do not reach this benchmark, indicating a lack of greenspace provision. Despite this, the proposed AWRP study area has high levels of green space provision, with multiple recreational areas such as Seafields Drive Playground, Hopton Harriers Football Club, and Gorleston Golf Club distributed across the area. These destinations are generally well connected, with a range of access routes available. As a result, the risk of severance affecting access to recreational spaces is limited, and overall sensitivity to severance is considered to be low. |
| Healthcare facilities                        | <b>Medium</b>           | Healthcare receptors include The Beaches Medical Centre (Hopton-on-Sea Branch), which is the closest facility at approximately 204m east of the proposed AWRP section of the EIA Scoping Area, as well as Ritson Lodge Care Home and Lound Hall Nursing Home. These facilities serve local residents, including more vulnerable groups such as the elderly and those with existing health conditions. Although they are accessible via multiple routes, the presence of vulnerable users increases sensitivity to potential disturbances, including noise, changes in air quality, and disruptions to access.                                                                                                                                                                                                                                                                                     |
| Transport and connectivity                   | <b>Medium</b>           | The proposed AWRP study area includes key transport routes, notably the A47 (Yarmouth Road), which may experience increased traffic and temporary disruption during construction. Approximately 12 Public Rights of Way ('PRoWs') and National Cycle Network ('NCN') Route 517 are also present. These receptors are moderately sensitive due to the potential                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |                         | for disruption to accessibility and movement patterns.<br>Further detail is provided in chapter 13 traffic and access.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Air quality                                                                         | <b>Low</b>              | The proposed AWRP study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Noise sensitivity                                                                   | <b>High</b>             | Sensitive receptors include nearby residential properties, community facilities, and noise-sensitive commercial uses. A farmstead located immediately adjacent to the proposed AWRP study area is expected to experience the highest levels of noise and vibration. Due to the proximity of receptors and the potential for both construction, operational and decommissioning noise impacts, overall sensitivity is considered to be high.                                                                                                                                                                                                                                                                                                                                  |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | <p>The main surface water receptor within the proposed AWRP study area is the headwater watercourse of Fritton Lake. There is no specific water quality data for this section, but the wider Fritton Decoy water body is classified as having 'bad' ecological status due to pollution from agriculture, industry and transport. This suggests water quality in the area is generally poor, although conditions closer to the proposed AWRP section of the EIA Scoping Area may vary.</p> <p>The North Sea is located to the east of the proposed AWRP section of the EIA Scoping Area. Within the study area, there are no additional field drains, canals, or surface water abstraction points.</p> <p>Further information is provided in chapter 9 water environment.</p> |
| Landscape amenity                                                                   | <b>Low</b>              | The proposed AWRP study area is primarily located within agricultural land, with limited public receptors due to existing vegetation which provide screening of this section of the EIA Scoping Area. While                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Key Health Factors | Preliminary Sensitivity | Commentary                                                                                                                                                                                                            |
|--------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                         | there may be some localised changes to landscape character, particularly during the Proposed Development's construction phase, the overall sensitivity is low due to the rural setting and limited visual prominence. |

18.4.44 Table 18-9 demonstrates that the proposed AWRP study area is characterised by an older population, fewer children, uneven deprivation across neighbourhoods, and moderate but locally elevated health and disability challenges, alongside a varied population density.

Table 18-9: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed AWRP Study Area

| Vulnerable/Disadvantaged Groups                                                                    | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                                         | <b>High</b> – The LSOAs within the proposed AWRP study area have a higher proportion (26.9%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                          |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed AWRP study area have a lower proportion (16.9%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                        |
| Those with a high level of income deprivation                                                      | <b>Low</b> – The majority of LSOAs within the proposed AWRP study area indicate relatively low levels of income deprivation. East Suffolk 001B is the most income deprived (less deprived than 56% of neighbourhoods in England), while East Suffolk 001D is the least deprived (less deprived than 72% of neighbourhoods). |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Medium</b> – The following conditions within the Middle-layer Super Output Areas ('MSOAs') in the proposed AWRP study Area have a higher prevalence than the national average: <ul style="list-style-type: none"> <li>Emergency hospital admissions for coronary heart disease (Great Yarmouth 013);</li> </ul>          |



| Vulnerable/<br>Disadvantaged Groups                     | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                         | <ul style="list-style-type: none"> <li>Emergency hospital admissions for chronic obstructive pulmonary disease ('COPD') (Great Yarmouth 013); and</li> <li>Emergency hospital admissions for heart attack (myocardial infarction) (Great Yarmouth 013, Great Yarmouth 010).</li> </ul>                                                                                                                                        |
| Those with disabilities and long-term health condition. | <b>Medium</b> – The LSOAs within the proposed AWRP study area have marginally more people (17.8%) who are disabled under the Equality Act 2010 to the regional (16.6%) and national (17.3%) averages.                                                                                                                                                                                                                         |
| Population Density                                      | <b>Medium</b> – The MSOAs within the proposed AWRP study area exhibit a varied range of population densities compared with the national average of 438 people per km <sup>2</sup> . East Suffolk 001 is the least densely populated, with a density equal to the national average (438 people per km <sup>2</sup> ), whereas Great Yarmouth 010 is considerably more densely populated, at 3,364 people per km <sup>2</sup> . |

### Proposed LSO

18.4.45 Table 18-10 demonstrates that the proposed LSO study area (which includes the three options for the LSO component of the Proposed Development's discharge of concentrated residual water ('CRW')) has a mixed sensitivity profile, with noise identified as a primary concern (high sensitivity) due to the presence of nearby residential properties, community facilities, and noise-sensitive commercial uses. Several factors show medium sensitivity, including community and education facilities, healthcare services, transport connectivity, and potential pollution pathways, reflecting the presence of vulnerable populations, key local services and important transport routes that could be affected by environmental or traffic changes. In contrast, green space, air quality, and landscape amenity are considered low sensitivity, indicating relative resilience and fewer constraints. Overall, the findings highlight noise, accessibility and environmental quality as the main areas requiring careful management.

Table 18-10: Preliminary Sensitivity of the Proposed LSO Study Area to Changes in Health Determinants

| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities          | <b>Medium</b>           | <p>The proposed LSO study area is located adjacent to the main built-up area of Hopton-on-Sea and includes several community facilities as well as at least 100 residential dwellings (including holiday mobile homes). Key receptors include:</p> <p>Education</p> <ul style="list-style-type: none"> <li>Hopton Church of England Primary School</li> </ul> <p>Community halls</p> <ul style="list-style-type: none"> <li>Hopton-on-Sea Village Hall</li> </ul> <p>Places of worship</p> <ul style="list-style-type: none"> <li>St Margaret's Parish Church</li> </ul> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.</p> |
| Green/open space and recreational facilities | <b>Low</b>              | <p>The proposed LSO study area is located within the following LSOAs: Great Yarmouth 013D, East Suffolk 001B and East Suffolk 001D. Great Yarmouth 013D and East Suffolk 001D have a high level of green space provision, exceeding the Fields in Trust benchmark. However, East Suffolk 001B does not meet the benchmark, but is close with a score of 0.92 [16].</p> <p>The proposed LSO study area has multiple recreational areas such as Gorleston Golf Course, play spaces, playing fields, bowling green and a sports facility. These destinations are generally well connected, with a range of access routes available. As a result, the risk of severance affecting access to recreational spaces is limited,</p>                                                              |

| Key Health Factors         | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                         | and overall sensitivity to severance is considered to be low.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Healthcare facilities      | <b>Medium</b>           | Healthcare receptors include The Beaches Medical Centre (Hopton-on-Sea Branch), which is the closest facility at approximately 280m west of the proposed LSO study area. Additionally, the Barchester – Ritson Lodge Care Home is located approximately 400m west of the proposed LSO study area. These facilities serve local residents, including more vulnerable groups such as the elderly and those with existing health conditions. Although they are accessible via multiple routes, the presence of vulnerable users increases sensitivity to potential disturbances, including noise, changes in air quality, and disruptions to access. |
| Transport and connectivity | <b>Medium</b>           | The proposed LSO study area includes key transport routes, notably the A47 (Yarmouth Road), which may experience increased traffic and temporary disruption during the Proposed Development's construction phase. Approximately eight PRow and NCN Route 517 are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns. Further detail is provided in chapter 13 traffic and access.                                                                                                                                                                                  |
| Air quality                | <b>Low</b>              | The proposed LSO study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.                                                                                                                                                                                                                                                                                                                                                                   |
| Noise sensitivity          | <b>High</b>             | Sensitive receptors include nearby residential properties, community facilities, and noise-sensitive commercial uses. A farm, named Valley Farm, is located immediately adjacent to the proposed LSO study area and is expected to experience the highest levels of noise and vibration. Due to the proximity of receptors and the potential for both construction and                                                                                                                                                                                                                                                                            |

| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |                         | operational noise impacts, overall sensitivity is considered high.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | <p>The North Sea has direct interaction with the proposed LSO section of the EIA Scoping Area. There are no Statutory Main Rivers ('SMRs') within the terrestrial area of this section. However, the upper headwaters of The Fleet, a tributary of the River Waveney, falls within the proposed LSO study area. This section of the coast is covered by the Water Framework Directive ('WFD') Norfolk East water body which is designated as a heavily modified water body (HMW) and classified as having moderate ecological status. To the south of Ness point is the Outer Harbour in Lowestoft.</p> <p>There are two designated bathing areas close to the proposed LSO section of the EIA Scoping Area. This may give an indication of the conditions of the water quality in this area. This data is publicly available to inform whether it is safe to swim that week. In 2025, Gorleston Beach was classified as having 'Excellent' bathing water quality and Lowestoft (North and South of Claremont Pier) has 'Good' bathing quality.</p> <p>Further information is provided in chapter 9 water environment.</p> |
| Landscape amenity                                                                   | <b>Low</b>              | <p>The proposed LSO study area is primarily located within agricultural land with limited public receptors due to existing vegetation which provide screening of the proposed LSO section of the EIA Scoping Area. While there may be some localised changes to landscape character, particularly during construction, the overall sensitivity is low due to the rural setting and limited visual prominence.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

18.4.46 Table 18-11 demonstrates that the proposed LSO study area is characterised by an older population, fewer children, relatively low levels of deprivation, and moderate but locally elevated health and disability challenges, alongside a varied population density.

Table 18-11: Prevalence of Vulnerable/Disadvantaged Groups in Proposed LSO Study Area

| Vulnerable/<br>Disadvantaged Groups                                                                | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                                         | <b>High</b> – The LSOAs within the proposed LSO study area have a higher proportion (33.0%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                                                                                                                                                               |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed LSO study area have a lower proportion (13.2%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                                                                                                                                                             |
| Those with a high level of income deprivation                                                      | <b>Low</b> – The majority of LSOAs within the proposed LSO study area indicate relatively low levels of income deprivation. East Suffolk 001B is the most income deprived (less deprived than 56% of neighbourhoods in England), while East Suffolk 001D is the least deprived (less deprived than 72% of neighbourhoods).                                                                                                                                      |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Medium</b> – The following conditions within the MSOAs in the proposed LSO study area have a higher prevalence than the national average: <ul style="list-style-type: none"> <li>• Emergency hospital admissions for coronary heart disease (Great Yarmouth 013);</li> <li>• Emergency hospital admissions COPD (Great Yarmouth 013); and</li> <li>• Emergency hospital admissions for heart attack (myocardial infarction) (Great Yarmouth 013).</li> </ul> |
| Those with disabilities and long-term health condition.                                            | <b>High</b> – The LSOAs within the proposed LSO study area have more people (20.2%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                                                                                                                                                                                |
| Population Density                                                                                 | <b>Medium</b> – The MSOAs within the proposed LSO study area exhibit a varied range of population densities compared with the national average of 438 people per km <sup>2</sup> . Great Yarmouth 013 has a higher population density (172 people per km <sup>2</sup> ), whereas East Suffolk 001 has a much lower population density (176 people per km <sup>2</sup> ).                                                                                        |

## Proposed CSR

18.4.47 Table 18-12 demonstrates that the proposed CSR study area has a mixed sensitivity profile, with noise identified as the primary concern (high sensitivity) due to the presence of nearby residential properties (including farms) and a special education school. Several factors show medium sensitivity, including community and education facilities, transport connectivity, and potential pollution pathways, reflecting the presence of vulnerable populations, key local services, and important transport routes that could be affected by environmental or traffic changes. In contrast, green space, air quality, and landscape amenity are considered low sensitivity, indicating relative resilience and fewer constraints. Overall, the findings highlight noise, accessibility, and environmental quality as the main areas requiring careful management.

Table 18-12: Preliminary Sensitivity of the Proposed CSR Study Area to Changes in Health Determinants

| Key Health Factors                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities | <b>Medium</b>           | <p>The proposed CSR section of the EIA Scoping Area is located within mainly agricultural land to the west of the small village of Sibton Green. The proposed CSR study area has at least 50 residential dwellings (including farms) and very few community facilities:</p> <p>Education</p> <ul style="list-style-type: none"> <li>Bramfield House School (Special Education School)</li> </ul> <p>There are no other community facilities, including community halls, medical centres or places of worship within the proposed CSR study area.</p> <p>These receptors, particularly residential properties, have a medium sensitivity to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during</p> |

| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              |                         | construction, operation and decommissioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Green/open space and recreational facilities | <b>Low</b>              | <p>The proposed CSR study area is located within the LSOAs: East Suffolk 016A, 016B and 16C. All three LSOAs have a low level of green space provision which do not achieve the Fields in Trust Benchmark. This is particularly evident for East Suffolk 016B which achieves a GSI score of 0.43.</p> <p>The proposed CSR study area has a few recreational areas such as White Wolf Cricket, a sports facility and a playing field. From satellite imagery, these destinations do not appear to be well connected, with only one access point available. However, as there are only three destinations, the risk of severance affecting access is limited, and overall sensitivity to severance is considered to be low.</p> |
| Healthcare facilities                        | <b>Negligible</b>       | Due to the rural nature of proposed CSR study area, there are no healthcare facilities, such as GP practices, care homes or dental services, within a 2km radius. Consequently, overall sensitivity is considered negligible, as the proposed CSR component of the Proposed Development would not result in severance or reduced accessibility to healthcare services.                                                                                                                                                                                                                                                                                                                                                        |
| Transport and connectivity                   | <b>Medium</b>           | <p>The proposed CSR study area includes key transport routes, notably the A1120 (Yoxford Road), which may experience increased traffic and temporary disruption during construction.</p> <p>Approximately 25 PRow and NCN Route 1 are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns.</p> <p>Further detail is provided in chapter 13 traffic and access.</p>                                                                                                                                                                                                                                                                              |
| Air quality                                  | <b>Low</b>              | The proposed CSR study area is not located within an AQMA, indicating baseline conditions are generally                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |                         | acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.                                                                                                                                                                                                                                                                                                                                                                                                            |
| Noise sensitivity                                                                   | <b>High</b>             | Sensitive receptors include nearby residential properties (including farms), and a special education school. Grove Cottages, a housing complex, and Mistletoe Cottage, self-catering accommodation, are located immediately south of the proposed CSR section of the EIA Scoping Area along with approximately two residential properties. These properties are expected to experience the highest levels of noise and vibration. Due to the proximity of receptors and the potential for both construction and operational noise impacts, overall sensitivity is considered high. |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | The surface water receptors within the proposed CSR study area comprises mainly of agricultural field drains and small unnamed watercourses. The exact number is currently unknown. There are multiple small unnamed ponds within the proposed CSR study area. These ponds are largely surrounded by riparian, mixed broadleaved woodland, with the wider land use being dominated by agricultural land. There are no Environment Agency water quality data available within the proposed CSR study area. Further information is provided in chapter 9 water environment.          |
| Landscape amenity                                                                   | <b>Low</b>              | The proposed CSR study area is primarily located within agricultural land with limited public receptors due to existing vegetation which provide screening of the proposed CSR section of the EIA Scoping Area. While there may be some localised changes to landscape character, particularly during construction, the overall sensitivity is low                                                                                                                                                                                                                                 |



| Key Health Factors | Preliminary Sensitivity | Commentary                                              |
|--------------------|-------------------------|---------------------------------------------------------|
|                    |                         | due to the rural setting and limited visual prominence. |

18.4.48 Table 18-13 demonstrates that the proposed CSR study area is characterised by an older population, fewer children, low levels of income deprivation, and moderate health and disability challenges, alongside a low population density.

Table 18-13: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed CSR Study Area

| Vulnerable/Disadvantaged Groups                                                                    | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                                         | <b>High</b> – The LSOAs within the proposed CSR study area have a higher proportion (39.2%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                          |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed CSR study area have a lower proportion (11.9%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                        |
| Those with a high level of income deprivation                                                      | <b>Low</b> – The majority of LSOAs within the proposed CSR study area indicate relatively low levels of income deprivation. East Suffolk 016A is the most income deprived (less deprived than 63% of neighbourhoods in England), while East Suffolk 016C is the least deprived (less deprived than 72% of neighbourhoods). |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Low</b> – From available health profile data for the MSOA East Suffolk 016, there are no higher prevalences of conditions or hospital admissions when compared against the national average.                                                                                                                            |
| Those with disabilities and long-term health condition.                                            | <b>Medium</b> – The LSOAs within the proposed CSR study area have marginally more people (19.2%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                              |
| Population Density                                                                                 | <b>Low</b> – The MSOA within the proposed CSR study area has a much lower population density (34 people                                                                                                                                                                                                                    |

| Vulnerable/<br>Disadvantaged<br>Groups | Prevalence (relationship to national average)                                              |
|----------------------------------------|--------------------------------------------------------------------------------------------|
|                                        | per km <sup>2</sup> ), compared to the national average (438 people per km <sup>2</sup> ). |

### Proposed WSR

18.4.49 Table 18-14 demonstrates that the proposed WSR study area has a mixed sensitivity profile, with noise identified as the primary concern (high sensitivity) due to the presence of nearby residential properties, schools, community halls, places of worship, health centres, a hospital and care homes. Several factors show medium sensitivity, including community and education facilities, green space and recreational facilities, healthcare services, transport connectivity, potential pollution pathways and landscape amenity. This reflects the presence of vulnerable populations, key local services, and important transport routes that could be affected by environmental or traffic changes. In contrast, air quality is considered low sensitivity. Overall, the findings highlight noise, accessibility and environmental quality as the main areas requiring careful management.

Table 18-14: Preliminary Sensitivity of the Proposed WSR Study Area to Changes in Health Determinants

| Key Health Factors                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities | <b>Medium</b>           | <p>The proposed WSR section of the EIA Scoping Area is located within mainly agricultural land in between the small village of Thrandeston (to the west) and Brome (to the east). There are a number of community facilities within the proposed WSR study area, including Mid Suffolk Business Park and at least 100 residential dwellings. Key receptors include:</p> <p>Education</p> <ul style="list-style-type: none"> <li>• Mellis Church of England (Voluntary Controlled) Primary School</li> <li>• Yaxley &amp; Mellis Pre-School</li> <li>• Hartismere School</li> </ul> |

| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              |                         | <ul style="list-style-type: none"> <li>Hartismere College</li> <li>The Peacock Montessori Nursery</li> <li>La Jolie Ronde Languages for Children (Language School)</li> <li>Oakland Lodge Children Nursery</li> </ul> <p>Community halls</p> <ul style="list-style-type: none"> <li>Brome and Oakley Village Hall</li> <li>Palgrave Community Centre</li> </ul> <p>Places of worship</p> <ul style="list-style-type: none"> <li>St Mary's Church, Thrandeston</li> <li>Place of Worship, off New Road</li> <li>All Saints' Church, Stuston</li> <li>St Peter's Church, Palgrave</li> <li>St Mary's Church, Yaxley</li> <li>Brome Church, St Mary's</li> </ul> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.</p> |
| Green/open space and recreational facilities | <b>Medium</b>           | <p>The proposed WSR study area is located within the LSOAs: Mid Suffolk 001A, 001C and 002C. Mid Suffolk 001C and 002C have a low level of green space provision and neither LSOA achieves the Fields in Trust Benchmark. However, Mid Suffolk 001A does meet the benchmark.</p> <p>The proposed WSR study area has a few recreational areas such as public green spaces, parks, allotments and community growing spaces, a bowling green and 'other sports facility'. The majority of these facilities are located within Eye. From satellite imagery, these destinations mostly appear to only have one access point. Therefore, there is a risk of severance affecting the accessibility of these facilities and overall sensitivity to severance is considered to be medium.</p>                                                                                          |

| Key Health Factors         | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Healthcare facilities      | <b>Medium</b>           | <p>Healthcare receptors include Hartismere Hospital, The Eye Health Centre, St John's House (Mental Health Services), Yaxley House Care Home and First Prime Care Ltd. These facilities serve local residents, including more vulnerable groups such as the elderly and those with existing health conditions.</p> <p>Although they are accessible via multiple routes, the presence of vulnerable users increases sensitivity to potential disturbances, including noise, changes in air quality, and disruptions to access.</p>                    |
| Transport and connectivity | <b>Medium</b>           | <p>The proposed WSR study area includes key transport routes, including the A143 (Old Bury Road), the A140, which may experience increased traffic and temporary disruption during construction. The proposed WSR study area also includes the main railway line between Diss and Stowmarket. Approximately 60 PRoWs and NCN Route 30 are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns.</p> <p>Further detail is provided in chapter 13 traffic and access.</p> |
| Air quality                | <b>Low</b>              | <p>The proposed WSR study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.</p>                                                                                                                                                                                                                                                               |
| Noise sensitivity          | <b>High</b>             | <p>Sensitive receptors include nearby residential properties, schools, community halls, places of worship, health centres, a hospital and care homes. Nearby residential properties are expected to experience the highest levels of noise and vibration. Due to the proximity of receptors and the potential for both construction and operational noise</p>                                                                                                                                                                                        |

| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |                         | impacts, overall sensitivity is considered high.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | <p>The main surface water receptors within this area are small unnamed field drains and tributaries of the River Dove and the River Waveney. Additionally, there are multiple small ponds, but further data is not available on these ponds. There is a small unnamed watercourse which flows directly through all the proposed WSR study area.</p> <p>Water quality for the WFD water bodies have been classified as being 'bad' to 'moderate' ecological status. This suggests water quality in the area is generally poor, although conditions closer to this section of the EIA Scoping Area may vary.</p> <p>Further information is provided in chapter 9 water environment.</p> |
| Landscape amenity                                                                   | <b>Medium</b>           | <p>The proposed WSR study area is primarily located within agricultural land with limited public receptors due to existing vegetation which provide screening of the proposed WSR section of the EIA Scoping Area. However, levels of screening may vary depending on the final site selection and layout, which are currently being refined. It is anticipated that there may be some localised changes to landscape character, particularly during construction. The overall sensitivity is considered to be medium.</p>                                                                                                                                                            |

18.4.50 Table 18-15 demonstrates that the proposed WSR study area is characterised by an older population, fewer children, low levels of income deprivation, and low levels of health and disability challenges, alongside a low population density.

Table 18-15: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed WSR Study Area

| Vulnerable/Disadvantaged Groups                                                                    | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                                         | <b>High</b> – The LSOAs within the proposed WSR study area have a higher proportion (30.7%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                                       |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed WSR study area have a lower proportion (14.1%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                                     |
| Those with a high level of income deprivation                                                      | <b>Low</b> – The majority of LSOAs within the proposed WSR study area indicate relatively low levels of income deprivation. Mid Suffolk 001A is the most income deprived (less deprived than 51% of neighbourhoods in England), while Mid Suffolk 001C is the least deprived (less deprived than 80% of neighbourhoods).                |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Low</b> – The following condition within the MSOAs in the proposed WSR study area is the only condition that has a higher prevalence than the national average: <ul style="list-style-type: none"> <li>Emergency hospital admissions for stroke (Mid Suffolk 002).</li> </ul>                                                        |
| Those with disabilities and long-term health condition                                             | <b>Low</b> – The LSOAs within the proposed WSR study area have marginally less people (16.2%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                                              |
| Population Density                                                                                 | <b>Low</b> – The MSOAs within the proposed WSR study area exhibit a very low population density when compared with the national average of 438 people per km <sup>2</sup> . Mid Suffolk 001 has a population density of 71 people per km <sup>2</sup> , and Mid Suffolk 002 has a population density of 79 people per km <sup>2</sup> . |

### Proposed AWRP to River Waveney Pipeline

18.4.51 Table 18-16 demonstrates that the proposed AWRP to River Waveney Pipeline study area has a medium to low sensitivity profile. Several factors show medium sensitivity, including community and education facilities, healthcare facilities, transport connectivity, noise sensitivity and potential pollution pathways. This reflects the presence of vulnerable populations,

key local services and important transport routes that could be affected by environmental or traffic changes. In contrast, green space, air quality and landscape amenity are considered low sensitivity, indicating relative resilience and fewer constraints.

Table 18-16: Preliminary Sensitivity of the Proposed AWRP to River Waveney Pipeline Study Area to Changes in Health Determinants

| Key Health Factors                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities | <b>Medium</b>           | <p>The proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area runs between Hopton-on-Sea and Ellingham. Within this study area, there are a number of community facilities, as well as at least 100 residential dwellings (including some mobile homes). Key receptors include:</p> <p>Education</p> <ul style="list-style-type: none"> <li>• Hopton Church of England Primary School</li> <li>• Gillingham St Michaels Primary School</li> </ul> <p>Community Facilities</p> <ul style="list-style-type: none"> <li>• Post Office (Hopton-on-Sea)</li> <li>• Hopton-on-Sea Village Hall</li> <li>• Lound Village Hall, Suffolk</li> <li>• Blundeston Village Hall</li> <li>• Geldeston Village Hall</li> </ul> <p>Places of worship</p> <ul style="list-style-type: none"> <li>• St Margaret's Parish Church</li> <li>• St John the Baptist's Church</li> <li>• All Saints' Church</li> <li>• St Mary's Church, Gillingham</li> <li>• Church of Our Lady of Perpetual Succour</li> <li>• St Michael and All Angels' Church</li> </ul> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during</p> |



| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              |                         | construction, operation and decommissioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Green/open space and recreational facilities | <b>Low</b>              | <p>The proposed AWRP to River Waveney Pipeline study area is located within the LSOAs: Great Yarmouth 013D, East Suffolk 001B, East Suffolk 001D, East Suffolk 001E, East Suffolk 011B, South Norfolk 010C, South Norfolk 010A, South Norfolk 010B.</p> <p>Great Yarmouth 013D, East Suffolk 001B and East Suffolk 001E have a high level of green space provision and exceed the Fields in Trust benchmark. However, East Suffolk 001D, South Norfolk 010C, South Norfolk 10A, South Norfolk 010B and East Suffolk 011B do not meet the benchmark.</p> <p>The proposed AWRP to River Waveney Pipeline study area has multiple green spaces and recreational areas such as bowling greens, play spaces, playing fields, public parks and gardens, allotments and community growing spaces. These destinations are generally well connected, with a range of access routes available. As a result, the risk of severance affecting access to recreational spaces is limited, and overall sensitivity to severance is considered to be low.</p> |
| Healthcare facilities                        | <b>Medium</b>           | <p>Healthcare receptors include Barchester – Ritson Lodge Care Home and Lound Hall Nursing Home. These facilities serve local residents, including more vulnerable groups such as the elderly and those with existing health conditions.</p> <p>Although they are accessible via multiple routes, the presence of vulnerable users increases sensitivity to potential disturbances, including noise, changes in air quality, and disruptions to access.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Transport and connectivity                   | <b>Medium</b>           | <p>The proposed AWRP to River Waveney Pipeline study area includes key transport routes, notably the A143 Norwich Road and the A47 Yarmouth Road, which may experience increased traffic and temporary disruption during construction. Additionally, the study area incorporates a railway line</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |                         | <p>between Somerleyton and Oulton Broad North.</p> <p>Approximately 63 PRoW and NCN Routes 1, 31 and 517 are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns.</p> <p>Further detail is provided in chapter 13 traffic and access.</p>                                                                                                                                                                                                                                                                      |
| Air quality                                                                         | <b>Low</b>              | <p>The proposed AWRP to River Waveney Pipeline study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.</p>                                                                                                                                                                                                                                                                            |
| Noise sensitivity                                                                   | <b>Medium</b>           | <p>Sensitive receptors include nearby residential properties, community and educational facilities. Residential properties located immediately adjacent to the proposed AWRP to River Waveney Pipeline study area are expected to experience the highest levels of noise and vibration. Due to the proximity of receptors and the potential for both construction and operational noise impacts, overall sensitivity is considered medium.</p>                                                                                                                                               |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | <p>There are two SMRs within the proposed AWRP to River Waveney Pipeline study area, the River Waveney and the upper headwaters of The Fleet. Due to the low-lying nature of the area, there are a significant number of drains and ponds within the floodplain of the River Waveney. This area is covered by two WFD catchments, Waveney (Ellingham Mill – Burgh St. Peter) Water Body and Bure &amp; Waveney &amp; Yare &amp; Lothing Transitional water body, both classified as ‘moderate’ ecological status.</p> <p>Further information is provided in chapter 9 water environment.</p> |
| Landscape amenity                                                                   | <b>Low</b>              | <p>The proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area is primarily located within agricultural land</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Key Health Factors | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                           |
|--------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                         | with limited public receptors due to existing vegetation which provide screening of this section of the EIA Scoping Area. While there may be some localised changes to landscape character, particularly during construction, the overall sensitivity is low due to the rural setting and limited visual prominence. |

18.4.52 Table 18-17 demonstrates that the proposed AWRP to River Waveney Pipeline study area is characterised by an older population, fewer children, low levels of income deprivation, and moderate to high health and disability challenges, alongside a varied population density.

Table 18-17: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed AWRP to River Waveney Pipeline Study Area

| Vulnerable/Disadvantaged Groups                                                                    | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                                         | <b>High</b> – The LSOAs within the proposed AWRP to River Waveney Pipeline study area have a higher proportion (30.9%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                          |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed AWRP to River Waveney Pipeline study area have a lower proportion (13.4%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                        |
| Those with a high level of income deprivation                                                      | <b>Low</b> – The majority of LSOAs within the proposed AWRP to River Waveney Pipeline study area indicate relatively low levels of income deprivation. East Suffolk 001B is the most income deprived (less deprived than 69% of neighbourhoods in England), while East Suffolk 001D is the least deprived (less deprived than 72% of neighbourhoods). |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Medium</b> – The following conditions within the MSOAs in the proposed AWRP to River Waveney Pipeline study area have a higher prevalence than the national average: <ul style="list-style-type: none"> <li>Emergency hospital admissions for coronary heart disease (Great Yarmouth 013).</li> </ul>                                              |

| Vulnerable/<br>Disadvantaged<br>Groups                 | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                        | <ul style="list-style-type: none"> <li>Emergency hospital admissions for heart attack (myocardial infarction) (Great Yarmouth 013, East Suffolk 011).</li> <li>Emergency hospital admissions for COPD (Great Yarmouth 013).</li> <li>Emergency hospital admissions for stroke (East Suffolk 011).</li> <li>Emergency hospital admissions for intentional self-harm (East Suffolk 011).</li> <li>Hip fractures (East Suffolk 011).</li> <li>Hospital admissions for alcohol attributable conditions (East Suffolk 011).</li> </ul> |
| Those with disabilities and long-term health condition | <b>High</b> – The LSOAs within the proposed AWRP to River Waveney Pipeline study area have more people (19.0%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                                                                                                                                                                                                                       |
| Population Density                                     | <b>Medium</b> – The MSOAs within the proposed AWRP to River Waveney Pipeline study area exhibit a varied range of population densities compared with the national average of 438 people per km <sup>2</sup> . East Suffolk 011 is the most densely populated, with a population density of 1,087 people per km <sup>2</sup> , whereas South Suffolk 010 has a very low density of 54 people.                                                                                                                                      |

### Proposed Barsham WTW to CSR Pipeline

18.4.53 Table 18-18 demonstrates that the proposed Barsham WTW to CSR Pipeline study area has a medium to low sensitivity profile. Several factors show medium sensitivity, including community and education facilities, healthcare facilities, transport connectivity, potential pollution pathways and noise sensitivity. This reflects the presence of vulnerable populations, key local services and important transport routes that could be affected by environmental or traffic changes. In contrast, green space, air quality and landscape amenity are considered low sensitivity, indicating relative resilience and fewer constraints.

Table 18-18: Preliminary Sensitivity of the Proposed Barsham WTW to CSR Pipeline Study Area to Changes in Key Health Factors

| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities          | <b>Medium</b>           | <p>The proposed Barsham WTW to CSR pipeline section of the EIA Scoping Area runs from the west of Beccles to Sibton Green. There are a number of community facilities within the Barsham WTW to CSR Pipeline study area, as well as at least 100 residential dwellings. Key receptors include:</p> <p>Education</p> <ul style="list-style-type: none"> <li>• Ringsfield Church of England (Voluntary Controlled) Primary School.</li> <li>• Ilketshall St Lawrence School.</li> </ul> <p>Places of worship</p> <ul style="list-style-type: none"> <li>• All Saint's Church.</li> <li>• St Peter's Church.</li> <li>• Walpole Old Chapel.</li> <li>• St Mary's Church.</li> </ul> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.</p> |
| Green/open space and recreational facilities | <b>Low</b>              | <p>The proposed Barsham WTW to CSR Pipeline study area is located within the LSOAs: East Suffolk 011B, East Suffolk 013D, East Suffolk 015A, East Suffolk 015B, East Suffolk 015C, East Suffolk 015D and East Suffolk 016A. East Suffolk 013D has a high level of green space provision and exceeds the Fields in Trust benchmark. However, the rest of the LSOAs in the proposed Barsham WTW to CSR Pipeline study area do not. The proposed Barsham WTW to CSR Pipeline study area has some recreational areas including playing fields, play spaces and a tennis court. These destinations are generally well connected, with a range of</p>                                                                                                                                                                                                                                                  |

| Key Health Factors         | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                         | access routes available. As a result, the risk of severance affecting access to recreational spaces is limited, and overall sensitivity to severance is considered to be low.                                                                                                                                                                                                                                                                                                  |
| Healthcare facilities      | <b>Medium</b>           | <p>Healthcare receptors include The Partnership in Care (Nursing Home) and Beech House (Assisted Living Residence). These facilities serve local residents, including more vulnerable groups such as the elderly and those with existing health conditions.</p> <p>Although they are accessible via multiple routes, the presence of vulnerable users increases sensitivity to potential disturbances, including noise, changes in air quality, and disruptions to access.</p> |
| Transport and connectivity | <b>Medium</b>           | <p>The proposed Barsham WTW to CSR Pipeline study area includes key transport routes, notably the A144 Halesworth Road, which may experience increased traffic and temporary disruption during construction. Approximately 70 PRoW and NCN Route 1 are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns.</p> <p>Further detail is provided in chapter 13 traffic and access.</p>              |
| Air quality                | <b>Low</b>              | <p>The proposed Barsham WTW to CSR Pipeline study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.</p>                                                                                                                                                                 |
| Noise sensitivity          | <b>Medium</b>           | <p>Sensitive receptors include nearby residential properties, schools, places of worship and healthcare receptors. community facilities, and noise-sensitive commercial uses. Due to the proximity of receptors and the potential for both construction and operational noise impacts, overall sensitivity is considered medium.</p>                                                                                                                                           |

| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | <p>A total of nine SMRs are located within proposed Barsham WTW to CSR Pipeline study area. Numerous smaller ditches and drainage features are present, typically associated with the surrounding arable and pastureland. These features have not been individually quantified at this scoping stage. There are also multiple ponds within the proposed Barsham WTW to CSR Pipeline study area.</p> <p>In relation to water quality, the WFD catchments are classified as 'good' to 'moderate' ecological status.</p> <p>Further information is provided in chapter 9 water environment.</p> |
| Landscape amenity                                                                   | <b>Low</b>              | <p>The proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area is primarily located within agricultural land with limited public receptors due to existing vegetation which provide screening of this section of the EIA Scoping Area. While there may be some localised changes to landscape character, particularly during construction, the overall sensitivity is low due to the rural setting and limited visual prominence.</p>                                                                                                                                           |

18.4.54 Table 18-19 demonstrates that the proposed Barsham WTW to CSR Pipeline study area is characterised by an older population, fewer children, uneven levels of deprivation across neighbourhoods, and moderate health and disability challenges, alongside a low population density.

Table 18-19: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed Barsham WTW to CSR Pipeline Study Area

| Vulnerable/<br>Disadvantaged Groups                                                                | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                                         | <b>High</b> – The LSOAs within the proposed Barsham WTW to CSR Pipeline study area have a higher proportion (35.4%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                                                                      |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed Barsham WTW to CSR Pipeline study area have a lower proportion (13.1%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                                                                    |
| Those with a high level of income deprivation                                                      | <b>Medium</b> – The majority of LSOAs within proposed Barsham WTW to CSR Pipeline study area indicate relatively low levels of income deprivation. However, East Suffolk 015C is the most income deprived (more deprived than 68% of neighbourhoods in England), while East Suffolk 013D is the least deprived (less deprived than 81% of neighbourhoods).                                     |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Low</b> – The following condition within the MSOAs in the proposed Barsham WTW to CSR Pipeline study area is the only condition that has a higher prevalence than the national average: <ul style="list-style-type: none"> <li>Emergency hospital admissions for heart attack (myocardial infarction) (East Suffolk 011).</li> </ul>                                                        |
| Those with disabilities and long-term health condition.                                            | <b>High</b> – The LSOAs within the proposed Barsham WTW to CSR Pipeline study area have more people (20.7%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                                                                                       |
| Population Density                                                                                 | <b>Low</b> – The MSOAs within proposed Barsham WTW to CSR Pipeline study area exhibit a low population density compared with the national average of 438 people per km <sup>2</sup> . East Suffolk 016 is the least densely populated, with a population density of 34 people per km <sup>2</sup> , whereas East Suffolk 015 is the most densely populated at 156 people per km <sup>2</sup> . |



## Proposed CSR to WSR Pipeline

18.4.55 Table 18-20 demonstrates that the proposed CSR to WSR pipeline study area has a mixed sensitivity profile, with noise identified as the primary concern (high sensitivity) due to the presence of nearby residential properties, community facilities, places of worship and educational facilities. Several factors show medium sensitivity, including community and education facilities, transport connectivity, and potential pollution pathways, reflecting the presence of vulnerable populations, key local services, and important transport routes that could be affected by environmental or traffic changes. In contrast, green space, air quality, and landscape amenity are considered low sensitivity, indicating relative resilience and fewer constraints.

Table 18-20: Preliminary Sensitivity of the Proposed CSR to WSR Pipeline Study Area to Changes in Key Health Factors

| Key Health Factors                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities | <b>Medium</b>           | <p>The proposed CSR to WSR Pipeline section of the EIA Scoping Area runs between Brome and Sibton Green. There are a number of community facilities, as well as approximately 50-100 residential dwellings. Key receptors include:</p> <p>Education</p> <ul style="list-style-type: none"> <li>• Wilby Church of England (Voluntary Controlled) Primary School.</li> </ul> <p>Community facilities</p> <ul style="list-style-type: none"> <li>• Post Office.</li> <li>• Horham Community Centre.</li> </ul> <p>Places of worship</p> <ul style="list-style-type: none"> <li>• St Mary's Church, Brome.</li> <li>• St Mary's Church, Horham.</li> <li>• St Mary's Church, Wilby.</li> <li>• Horham Baptist Chapel.</li> </ul> |



| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              |                         | These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Green/open space and recreational facilities | <b>Low</b>              | <p>The proposed CSR to WSR Pipeline study area is located within the LSOAs: Mid Suffolk 001C, Mid Suffolk 001A, Mid Suffolk 001B, Mid Suffolk 003D, Mid Suffolk 003C, Mid Suffolk 003E, East Suffolk 017D and East Suffolk 016A. Mid Suffolk 001A and East Suffolk 017D have a high level of green space provision, exceeding the Fields in Trust benchmark. The remaining LSOAs do not reach this benchmark, indicating a lack of greenspace provision.</p> <p>The proposed CSR to WSR Pipeline study area lacks recreational areas, with only a bowling green located within it. As a result, the risk of severance affecting access this recreational space is limited, and overall sensitivity to severance is considered to be low.</p> |
| Healthcare facilities                        | <b>Negligible</b>       | Due to the rural nature of the proposed CSR to WSR Pipeline study area, there are no healthcare facilities, such as GP practices, care homes or dental services, within a 500m radius. Consequently, overall sensitivity is considered negligible, as the pipeline would not result in severance or reduced accessibility to healthcare services.                                                                                                                                                                                                                                                                                                                                                                                            |
| Transport and connectivity                   | <b>Medium</b>           | <p>The proposed CSR to WSR Pipeline study area includes key transport routes, notably the A140, which may experience increased traffic and temporary disruption during construction. Approximately 100 PRoW and NCN Route 1 and 30 are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns. Further detail is provided in chapter 13 traffic and access.</p>                                                                                                                                                                                                                                                                                                   |

| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Air quality                                                                         | Low                     | The proposed CSR to WSR Pipeline study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Noise sensitivity                                                                   | High                    | Sensitive receptors include nearby residential properties, community facilities, places of worship and educational facilities. Due to the proximity of receptors and the potential for both construction and operational noise impacts, overall sensitivity is considered high.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Sources and pathways of potential pollution, including land and water contamination | Medium                  | <p>There are three SMRs within the proposed CSR to WSR Pipeline study area. These are the River Blyth, River Dove and River Yox. Additionally, there are multiple ordinary watercourses, agricultural field drains and ponds within the proposed CSR to WSR Pipeline study area. The drains and ponds have not been quantified at this scoping stage.</p> <p>In relation to water quality, the Blyth is classified as having 'good' ecological status, however, it is designated as a HMWB. The Dove water body is classified as having 'moderate' ecological status and is designated as a HMWB. The Minsmere Old River water body is classified as 'moderate' ecological status and is designated as a HMWB.</p> <p>Further information is provided in chapter 9 water environment.</p> |
| Landscape amenity                                                                   | Low                     | The proposed CSR to WSR Pipeline study area is primarily located within agricultural land with limited public receptors due to existing vegetation which provide screening of the proposed CSR to WSR Pipeline section of the EIA Scoping Area. While there may be some localised changes to landscape character, particularly during construction, the overall sensitivity is low due to the rural setting and limited visual prominence.                                                                                                                                                                                                                                                                                                                                                |

18.4.56 Table 18-21 demonstrates that the proposed CSR to WSR Pipeline study area is characterised by an older population, fewer children, low levels of income deprivation, and moderate health and disability challenges, as well as a low population density.

Table 18-21: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed CSR to WSR Pipeline Study Area

| Vulnerable/<br>Disadvantaged<br>Groups                                                             | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                                         | <b>High</b> – The LSOAs within the proposed CSR to WSR Pipeline study area have a higher proportion (32.1%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                                                                        |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed CSR to WSR Pipeline study area have a lower proportion (13.7%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                                                                      |
| Those with a high level of income deprivation                                                      | <b>Low</b> – The majority of LSOAs within the proposed CSR to WSR Pipeline study area indicate relatively low levels of income deprivation. Mid Suffolk 001A is the most income deprived (less deprived than 51% of neighbourhoods in England), while Mid Suffolk 001B is the least deprived (less deprived than 83% of neighbourhoods).                                                 |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Low</b> – From available health profile data for the MSOAs within the proposed CSR to WSR Pipeline study area, there are no higher prevalences of conditions or hospital admissions when compared against the national average.                                                                                                                                                       |
| Those with disabilities and long-term health condition                                             | <b>Medium</b> – The LSOAs within the proposed CSR to WSR Pipeline study area have marginally more people (18.3%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                                                                            |
| Population Density                                                                                 | <b>Low</b> – The MSOAs within the proposed CSR to WSR Pipeline study area exhibit a low population density compared with the national average of 438 people per km <sup>2</sup> . East Suffolk 016 is the least densely populated, with a population density of 34 people per km <sup>2</sup> , whereas Mid Suffolk 001 is the most densely populated at 71 people per km <sup>2</sup> . |

## Proposed CSR to Saxmundham Pipeline

18.4.57 Table 18-22 demonstrates that the proposed CSR to Saxmundham Pipeline study area has a mixed sensitivity profile, with noise identified as the primary concern (high sensitivity) due to the presence of nearby residential properties, community facilities, and educational facilities. Several factors show medium sensitivity, including community and education facilities, green/open space and recreational facilities, healthcare services, transport connectivity, and potential pollution pathways, reflecting the presence of vulnerable populations, key local services, and important transport routes that could be affected by environmental or traffic changes. In contrast, air quality, and landscape amenity are considered low sensitivity, indicating relative resilience and fewer constraints. Overall, the findings highlight noise, accessibility, and environmental quality as the main areas requiring appropriate management.

Table 18-22: Preliminary Sensitivity of the Proposed CSR to Saxmundham Pipeline Study Area to Changes in Key Health Factors

| Key Health Factors                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities | <b>Medium</b>           | <p>The proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area runs from agricultural fields in Sibton Green down to agricultural fields located to the west of Saxmundham. There are a number of community facilities within the proposed CSR to Saxmundham Pipeline study area, as well as at least residential properties (primarily located within Saxmundham). Key receptors include:</p> <p>Education</p> <ul style="list-style-type: none"> <li>• Saxmundham Primary School.</li> <li>• Saxmundham Free School.</li> </ul> <p>Community facilities</p> <ul style="list-style-type: none"> <li>• Saxmundham Community Fire and Police Station.</li> </ul> <p>Places of worship</p> |

| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              |                         | <ul style="list-style-type: none"> <li>Saxmundham United Reformed Church</li> <li>St Peter's Church.</li> </ul> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Green/open space and recreational facilities | <b>Medium</b>           | <p>The proposed CSR to Saxmundham Pipeline study area is located within the LSOAs: East Suffolk 018D, East Suffolk 018C, East Suffolk 018B, East Suffolk 017E, East Suffolk 016A. The Study area has a low level of green space provision, as none of the LSOAs achieve the Fields in Trust benchmark.</p> <p>Despite this, the proposed CSR to Saxmundham Pipeline study area has multiple recreational areas, the majority are located within Saxmundham, such as public parks or gardens, Saxmundham War Memorial Playing Field, Mayflower Play Area, allotments or community growing spaces, play spaces, playing fields and a cemetery.</p> <p>These destinations are generally well connected, with a range of access routes available. However, the risk of severance affecting access to recreational spaces is moderate, particularly during construction. Therefore, the overall sensitivity to severance is considered to be moderate.</p> |
| Healthcare facilities                        | <b>Medium</b>           | <p>Healthcare receptors include Tru-Care (assisted living residence) and Chantry House Nursing Home. These facilities serve local residents, including more vulnerable groups such as the elderly and those with existing health conditions.</p> <p>Although they are accessible via multiple routes, the presence of vulnerable users increases sensitivity to potential disturbances, including noise, changes in air quality, and disruptions to access.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transport and connectivity                                                          | <b>Medium</b>           | The proposed CSR to Saxmundham Pipeline study area includes key transport routes, notably the A12 and the A1120 Yoxford Road, which may experience increased traffic and temporary disruption during construction. Additionally, the main train line between Saxmundham and Wickham Market is located within the proposed CSR to Saxmundham Pipeline study area. Approximately 50 PRoW and NCN Route 1 are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns.<br>Further detail is provided in chapter 13 traffic and access. |
| Air quality                                                                         | <b>Low</b>              | The proposed CSR to Saxmundham Pipeline study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air Quality and odour.                                                                                                                                                                                                                                                                                                        |
| Noise sensitivity                                                                   | <b>High</b>             | Sensitive receptors include nearby residential properties, community facilities, and educational facilities. Due to the proximity and the number of receptors and the potential for both construction and operational noise impacts, overall sensitivity is considered high.                                                                                                                                                                                                                                                                                                                                  |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | There are four SMRs which fall within the proposed CSR to Saxmundham Pipeline study area, comprising the River Yox, River Fromus, The Gull and an unnamed tributary of the River Fromus. There are also three WFD catchments within this area, these are Minsmere Old River water body ('moderate' ecological status), Fromus water body ('poor' ecological status) and Alde water body ('moderate' ecological status and HMWB).<br>Further information is provided in chapter 9 water environment.                                                                                                           |
| Landscape amenity                                                                   | <b>Low</b>              | The proposed CSR to Saxmundham Pipeline study area is primarily located                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Key Health Factors | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                         | within agricultural land with limited public receptors due to existing vegetation which provide screening of the proposed CSR to Saxmundham pipeline section of the EIA Scoping Area. While there may be some localised changes to landscape character, particularly during construction, the overall sensitivity is low due to the rural setting and limited visual prominence. |

18.4.58 Table 18-23 demonstrates that the proposed CSR to Saxmundham Pipeline study area is characterised by an older population, fewer children, uneven deprivation across neighbourhoods, and moderate but locally elevated health and disability challenges, as well as a low population density.

Table 18-23: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed CSR to Saxmundham Pipeline Study area

| Vulnerable/Disadvantaged Groups                                               | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                    | <b>High</b> – The LSOAs within the proposed CSR to Saxmundham Pipeline study area have a higher proportion (29.1%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                                      |
| Children (under 16)                                                           | <b>Low</b> – The LSOAs within the proposed CSR to Saxmundham Pipeline study area have a lower proportion (16.0%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                                    |
| Those with a high level of income deprivation                                 | <b>Medium</b> – The majority of LSOAs within the proposed CSR to Saxmundham Pipeline study area indicate relatively low levels of income deprivation. However, East Suffolk 018D is the most income deprived (more deprived than 71% of neighbourhoods in England), while East Suffolk 017E is the least deprived (less deprived than 68% of neighbourhoods). |
| Those with pre-existing health conditions, such as cardiovascular disease and | <b>Low</b> – The following condition within the MSOAs in the proposed CSR to Saxmundham Pipeline study area is the only condition that has a higher prevalence than the national average:                                                                                                                                                                     |



| Vulnerable/<br>Disadvantaged<br>Groups                 | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| respiratory diseases                                   | <ul style="list-style-type: none"> <li>Emergency hospital admissions for intentional self-harm (East Suffolk 018).</li> </ul>                                                                                                                                                                                                                                                                     |
| Those with disabilities and long-term health condition | <b>High</b> – The LSOAs within the proposed CSR to Saxmundham Pipeline study area have more people (19.1%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                                                                                           |
| Population Density                                     | <b>Low</b> – The MSOAs within the proposed CSR to Saxmundham Pipeline study area exhibit a low population density compared with the national average of 438 people per km <sup>2</sup> . East Suffolk 016 is the least densely populated, with a population density of 34 people per km <sup>2</sup> , whereas East Suffolk 018 is the most densely populated at 128 people per km <sup>2</sup> . |

### Proposed Saxmundham to SZC Pipeline

18.4.59 Table 18-24 demonstrates that the proposed Saxmundham to SZC Pipeline study area has a mixed sensitivity profile, with noise identified as the primary concern (high sensitivity) due to the presence of nearby residential properties and farms, community facilities, and commercial properties including CEMEX Saxmundham Concrete Plant, Sizewell B Power Station ('SZB') and SZC. Several factors show medium sensitivity, including community and education facilities, green/open space and recreational facilities, healthcare services, transport connectivity, and potential pollution pathways, reflecting the presence of vulnerable populations, key local services, and important transport routes that could be affected by environmental or traffic changes. In contrast, air quality, and landscape amenity are considered low sensitivity, indicating relative resilience and fewer constraints.



Table 18-24: Preliminary Sensitivity of the Proposed Saxmundham to SZC Pipeline Study Area to Changes in Key Health Factors

| Key Health Factors                           | Sensitivity   | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities          | <b>Medium</b> | <p>The proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area runs through agricultural fields north of Lonely Farm Country Park to the north of SZB and SZC. There are a number of community facilities within the Saxmundham to SZC Pipeline study area, as well as more than 100 residential properties and farms which are primarily located along Leiston Road and to the north of Kelsale. Additionally, there are holiday homes located within Lonely Farm Country Park. Key receptors include:</p> <p>Community facilities</p> <ul style="list-style-type: none"> <li>• Kelsale Village Hall.</li> </ul> <p>Places of worship</p> <ul style="list-style-type: none"> <li>• St Mary and St Peter's Church.</li> <li>• St Peter's Church.</li> <li>• Lady Chapel.</li> </ul> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.</p> |
| Green/open space and recreational facilities | <b>Medium</b> | <p>The proposed Saxmundham to SZC Pipeline study area is located within the LSOAs: East Suffolk 018B, East Suffolk 018A East Suffolk 018C, East Suffolk 019C and East Suffolk 019E. East Suffolk 018A has a high level of green space provision, exceeding the Fields in Trust benchmark. However, the remaining LSOAs do not reach this benchmark, indicating a lack of greenspace provision.</p> <p>The proposed Saxmundham to SZC Pipeline study area has various recreational areas such as Lonely Farm Country Park (including camping and caravan site), playing fields, allotments and community</p>                                                                                                                                                                                                                                                                                                                                                                                                     |

| Key Health Factors         | Sensitivity   | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |               | growing spaces (including Sax Community Allotment), a cemetery and a play space. From satellite imagery, these destinations mostly appear to only have one access point. Therefore, there is a risk of severance affecting the accessibility of these facilities and overall sensitivity to severance is considered to be medium.                                                                                                                                                                                                                                     |
| Healthcare facilities      | <b>Medium</b> | The only healthcare receptors in the proposed Saxmundham to SZC Pipeline study area is Leiston Old Abbey Residential Home. This facility serves local residents, including more vulnerable groups such as the elderly. The facility is accessible via only one route, and the presence of vulnerable users increases sensitivity to potential disturbances, including noise, changes in air quality, and disruptions to access.                                                                                                                                       |
| Transport and connectivity | <b>Medium</b> | The proposed Saxmundham to SZC Pipeline study area includes key transport routes, notably the A12, which may experience increased traffic and temporary disruption during construction. Additionally, two train lines are located within the study area, running north and east. There are approximately 40 PRoW located within the proposed Saxmundham to SZC Pipeline study area. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns. Further detail is provided in chapter 13 traffic and access. |
| Air quality                | <b>Low</b>    | The proposed Saxmundham to SZC Pipeline study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.                                                                                                                                                                                                                                                                |
| Noise sensitivity          | <b>High</b>   | Sensitive receptors include nearby residential properties and farms, community facilities, and commercial properties including CEMEX Saxmundham Concrete Plant, SZB and SZC.                                                                                                                                                                                                                                                                                                                                                                                          |

| Key Health Factors                                                                  | Sensitivity   | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |               | A farmstead and the CEMEX Saxmundham Concrete Plant are located within the proposed Saxmundham to SZC Pipeline study area, and both are expected to experience the highest levels of noise and vibration. Due to the proximity and the number of receptors and the potential for both construction and operational noise impacts, overall sensitivity is considered high.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b> | <p>There are four SMRs located within the proposed Saxmundham to SZC Pipeline study area, comprising the River Fromus, two tributaries of the Hundred River, a tributary of the Minsmere Old River and Leiston Beck which flows out into the North Sea.</p> <p>There are also four WFD catchments within the proposed Saxmundham to SZC Pipeline study area: Leiston Beck Water Body, Minsmere Old River Water Body, Hundred River Water Body and the Fromus Water Body. Under the WFD Cycle 3 classification, Leiston Beck Water Body and Minsmere Old River Water Body are classified as having moderate ecological status, Hundred River Water Body is classified as having bad ecological status, and Fromus Water Body is classified as having poor ecological status. Leiston Beck Water Body and Hundred River Water Body are designated as HMWBs.</p> <p>Further information is provided in chapter 9 water environment.</p> |
| Landscape amenity                                                                   | <b>Low</b>    | The proposed Saxmundham to SZC Pipeline study area is primarily located within agricultural land with limited public receptors due to existing vegetation which provide screening of the proposed Saxmundham to SZC pipeline section of the EIA Scoping Area. While there may be some localised changes to landscape character, particularly during construction, the overall sensitivity is low due to the rural setting and limited visual prominence.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

18.4.60 Table 18-25 demonstrates that proposed Saxmundham to SZC Pipeline study area is characterised by an older population, fewer children, moderate levels of income deprivation, moderate to high health and disability challenges, as well as a low population density.

Table 18-25: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed Saxmundham to SZC Pipeline Study Area

| Vulnerable/Disadvantaged Groups                                                                    | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                                                                         | <b>High</b> – The LSOAs within the proposed Saxmundham to SZC Pipeline study area have a higher proportion (29.5%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                                                                                                                                           |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed Saxmundham to SZC Pipeline study area have a lower proportion (16.7%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                                                                                                                                         |
| Those with a high level of income deprivation                                                      | <b>Medium</b> – The majority of LSOAs within the proposed Saxmundham to SZC Pipeline study area indicate relatively moderate levels of income deprivation. East Suffolk 019C is the most income deprived (more deprived than 69% of neighbourhoods in England), while East Suffolk 018A is the least deprived (more deprived than 50% of neighbourhoods).                                                                                                          |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Medium</b> – The following conditions within the MSOAs in the proposed Saxmundham to SZC Pipeline study area have a higher prevalence than the national average: <ul style="list-style-type: none"> <li>• Emergency hospital admissions for stroke (East Suffolk 019).</li> <li>• Hospital admissions for alcohol attributable conditions (East Suffolk 019).</li> <li>• Emergency hospital admissions for intentional self-harm (East Suffolk 018).</li> </ul> |
| Those with disabilities and long-term health condition                                             | <b>High</b> – The LSOAs within proposed Saxmundham to SZC Pipeline study area have more people (22.7%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                                                                                                                                                                |

| Vulnerable/<br>Disadvantaged Groups | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Population Density                  | <b>Low</b> – The MSOAs within the proposed Saxmundham to SZC Pipeline study area exhibit a low population density compared with the national average of 438 people per km <sup>2</sup> . East Suffolk 018 is the least densely populated, with a population density of 128 people per km <sup>2</sup> , whereas East Suffolk 019 is the most densely populated at 236 people per km <sup>2</sup> . |

### Proposed Eastern Distribution Main

- 18.4.61 Table 18-26 demonstrates that the proposed Eastern Distribution Mains study area has a mixed sensitivity profile, with noise identified as the primary concern (high sensitivity) due to the presence of nearby residential properties, healthcare facilities, community facilities, educational facilities and commercial properties including Eye Airfield Industrial Estate and Brome Industrial Estate. Several factors show medium sensitivity, including community and education facilities, green/open space and recreational facilities, healthcare services, transport connectivity, potential pollution pathways and landscape amenity. This reflects the presence of vulnerable populations, key local services, and important transport routes that could be affected by environmental or traffic changes. In contrast, air quality is considered low sensitivity, indicating relative resilience and fewer constraints.

Table 18-26: Preliminary Sensitivity of the Proposed Eastern Distribution Mains Study Area to Changes in Key Health Factors

| Key Health Factors                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities | <b>Medium</b>           | The proposed Eastern Distribution Mains section of the EIA Scoping Area is located in agricultural land parcels which border the villages of Yaxley and Brome. There are a number of community facilities within the Eastern Distribution Mains study area, alongside at least 100 residential properties. Key receptors include: |

| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              |                         | <p>Education</p> <ul style="list-style-type: none"> <li>Mellis Church of England (Voluntary Controlled) Primary School.</li> </ul> <p>Community facilities</p> <ul style="list-style-type: none"> <li>Yaxley Village Hall.</li> </ul> <p>Places of worship</p> <ul style="list-style-type: none"> <li>St Mary's Church, Mellis.</li> <li>St Mary's Church, Yaxley.</li> <li>St Mary's Church, Thrandeston.</li> </ul> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.</p>                                                                                                                                                                                                                                             |
| Green/open space and recreational facilities | <b>Medium</b>           | <p>The proposed Eastern Distribution Mains study area is located within the LSOAs: Mid Suffolk 001A, Mid Suffolk 001C, Mid Suffolk 002B and Mid Suffolk 002C. Mid Suffolk 001A and Mid Suffolk 002B have a high level of green space provision, exceeding the Fields in Trust benchmark. However, the remaining LSOAs do not reach this benchmark, indicating a lack of greenspace provision.</p> <p>Despite this, the proposed Eastern Distribution Mains study area has multiple recreational areas including, Mellis Common, allotments and community growing spaces.</p> <p>These destinations are generally well connected, with a range of access routes available. However, the risk of severance affecting access to recreational spaces is moderate, particularly during construction. Therefore, the overall sensitivity to severance is considered to be moderate.</p> |
| Healthcare facilities                        | <b>Medium</b>           | <p>Healthcare receptors include Yaxley House Care Home and the Limes Retirement Homes. These facilities serve local residents, including more vulnerable</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |                         | groups such as the elderly and those with existing health conditions.<br>Although they are accessible via multiple routes, the presence of vulnerable users increases sensitivity to potential disturbances, including noise, changes in air quality, and disruptions to access.                                                                                                                                                                                                                                                                              |
| Transport and connectivity                                                          | <b>Medium</b>           | The proposed Eastern Distribution Mains study area includes key transport routes, notably the A140, which may experience increased traffic and temporary disruption during construction. Additionally, the main train line between Stowmarket and Diss runs through the proposed Distribution Mains study area. Approximately 50 PRoW and NCN Route 30 are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns.<br>Further detail is provided in chapter 13 traffic and access. |
| Air quality                                                                         | <b>Low</b>              | The proposed Eastern Distribution Mains study area is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.                                                                                                                                                                                                                                                        |
| Noise sensitivity                                                                   | <b>High</b>             | Sensitive receptors include nearby residential properties, healthcare facilities, community facilities, educational facilities and commercial properties including Eye Airfield Industrial Estate and Brome Industrial Estate. Due to the proximity and the number of receptors and the potential for both construction and operational noise impacts, overall sensitivity is considered high.                                                                                                                                                                |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | The proposed Eastern Distribution Mains study area also overlaps with the proposed WSR study area and surface water receptors will also apply to this section of the EIA Scoping Area.<br>There are no further SMRs within the proposed Eastern Distribution Mains study area. However, there is an additional                                                                                                                                                                                                                                                |



| Key Health Factors | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                         | <p>tributary of the River Dove which forms near Mellis and flows east through Yaxley and joining the River Dove near Eye. This watercourse is designated under the WFD as Dove tributary – Eye water body.</p> <p>There are multiple additional agricultural ditches, drains and ponds within the proposed Eastern Distribution Mains study area, however, these are not quantified at this scoping stage.</p> <p>In relation to water quality, both water bodies are classified as ‘moderate’ ecological status.</p> <p>Further information is provided in chapter 9 water environment.</p> |
| Landscape amenity  | <b>Medium</b>           | <p>The proposed Eastern Distribution Mains study area is primarily located within agricultural land. However, the agricultural land is located in proximity to residential receptors within the villages of Brome, Mellis and Yaxley. Some sections have limited existing vegetation which provide limited screening of the proposed Distribution Mains section of the EIA Scoping Area. It is anticipated that there will be some localised changes to the landscape character, particularly during construction. The overall sensitivity is medium.</p>                                    |

18.4.62 Table 18-27 demonstrates that the proposed Eastern Distribution Mains study area, is characterised by an older population, fewer children, low levels of income deprivation, and low to moderate health and disability challenges, as well as a low population density.

Table 18-27: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed Eastern Distribution Mains Study Area

| Vulnerable/ Disadvantaged Groups | Prevalence (relationship to national average)                                                                                        |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)       | <b>High</b> – The LSOAs within the proposed Eastern Distribution Mains study area have a higher proportion (30.8%) of residents aged |



| Vulnerable/<br>Disadvantaged Groups                                                                | Prevalence (relationship to national average)                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                    | 65+ compared to the regional (20.0%) and national (18.7%) averages.                                                                                                                                                                                                                                                                             |
| Children (under 16)                                                                                | <b>Low</b> – The LSOAs within the proposed Eastern Distribution Mains study area have a lower proportion (13.9%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages.                                                                                                                                      |
| Those with a high level of income deprivation                                                      | <b>Low</b> – The majority of LSOAs within the proposed Eastern Distribution Mains study area indicate relatively low levels of income deprivation. Mid Suffolk 001A is the most income deprived (less deprived than 51% of neighbourhoods in England), while Mid Suffolk 002B is the least deprived (less deprived than 85% of neighbourhoods). |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Low</b> – From available health profile data for the MSOAs in the proposed Eastern Distribution Mains study area, there are no higher prevalences of conditions or hospital admissions when compared against the national average.                                                                                                           |
| Those with disabilities and long-term health condition.                                            | <b>Medium</b> – The LSOAs within the proposed Eastern Distribution Mains study area have marginally more people (19.2%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.                                                                                                            |
| Population Density                                                                                 | <b>Low</b> – The MSOAs within the proposed Eastern Distribution Mains study area exhibit a low population density compared with the national average of 438 people per km <sup>2</sup> .                                                                                                                                                        |

### Proposed Western Distribution Main Area

- 18.4.63 Table 18-28 demonstrates that the proposed Western Distribution Mains study area has a mixed sensitivity profile, with noise identified as the primary concern (high sensitivity) due to the presence of nearby residential properties and community facilities, including St Bartholomew's Church. Several factors show medium sensitivity, including community and education facilities, green/open space and recreational facilities, transport connectivity, potential pollution pathways and landscape amenity. This

reflects the presence of at least 100 residential properties, recreational assets, Public Rights of Way, the Stowmarket to Diss railway line, and surface water receptors that could be affected by environmental, accessibility or traffic-related changes. In contrast, air quality is considered low sensitivity, reflecting generally good baseline conditions and fewer constraints, while healthcare facilities are of negligible sensitivity due to the absence of healthcare services within 500m of the study area.

Table 18-28: Preliminary Sensitivity of the Proposed Western Distribution Mains Study Area to Changes in Key Health Factors

| Key Health Factors                           | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community, and education facilities          | <b>Medium</b>           | <p>The proposed Western Distribution Mains section of the EIA Scoping Area is located within Finningham and in agricultural land parcels. There are at least 100 residential properties within the study area. Other key receptors include St Bartholomew's Church.</p> <p>These receptors are moderately sensitive to changes in the local environment, particularly from noise, changes in air quality, and increased traffic during construction, operation and decommissioning.</p>                                                                                                                                                                                                                                                                              |
| Green/open space and recreational facilities | <b>Medium</b>           | <p>The proposed Western Distribution Mains study area is located within the LSOAs: Mid Suffolk 002A, Mid Suffolk 005B and Mid Suffolk 005C. These LSOAs do not have a high level of green space provision, failing to meet the Fields in Trust benchmark.</p> <p>Despite this, the proposed Western Distribution Mains study area has multiple recreational areas including, Church Green playing field, a cemetery, a playing field and Little Green Park.</p> <p>These destinations are generally well connected, with a range of access routes available. However, the risk of severance affecting access to recreational spaces is moderate, particularly during construction. Therefore, the overall sensitivity to severance is considered to be moderate.</p> |

| Key Health Factors                                                                  | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Healthcare facilities                                                               | <b>Negligible</b>       | There are no healthcare facilities, such as GP practices, care homes or dental services, within a 500m radius of proposed Western Distribution Mains section of the EIA Scoping Area. Consequently, overall sensitivity is considered negligible.                                                                                                                                                                                                                                                                                        |
| Transport and connectivity                                                          | <b>Medium</b>           | The main train line between Stowmarket and Diss runs through the proposed Western Distribution Mains study area. Approximately 50 PROW are also present. These receptors are moderately sensitive due to the potential for disruption to accessibility and movement patterns. Further detail is provided in chapter 13 traffic and access.                                                                                                                                                                                               |
| Air quality                                                                         | <b>Low</b>              | The proposed Western Distribution Mains study area, is not located within an AQMA, indicating baseline conditions are generally acceptable. As such, overall sensitivity is considered low, although localised impacts may still occur. Further detail is provided in chapter 15 air quality and odour.                                                                                                                                                                                                                                  |
| Noise sensitivity                                                                   | <b>High</b>             | Sensitive receptors include nearby residential properties and community facilities such as St Bartholomew's church. Due to the proximity and the number of receptors and the potential for both construction and operational noise impacts, overall sensitivity is considered high.                                                                                                                                                                                                                                                      |
| Sources and pathways of potential pollution, including land and water contamination | <b>Medium</b>           | Within the proposed Western Distribution Mains study area, there are ordinary watercourses present including the upper reaches of the River Dove. Within the study area, a tributary of the River Dove flows north, joining near Eastlands Lane. This watercourse is designated under the WFD as Dove tributary – Finningham water body.<br><br>There are multiple additional agricultural ditches, drains and ponds within the proposed Western Distribution Mains study area, however, these are not quantified at this scoping stage. |

| Key Health Factors | Preliminary Sensitivity | Commentary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                         | In relation to water quality, the Finningham water body is classified as 'moderate' ecological status.<br>Further information is provided in chapter 9 water environment.                                                                                                                                                                                                                                                                                                                                                                   |
| Landscape amenity  | <b>Medium</b>           | The proposed Western Distribution Mains study area is primarily located within agricultural land. However, the agricultural land is located in proximity to residential receptors within the village of Finningham. Some sections have limited existing vegetation which provide limited screening of the proposed Western Distribution Mains section of the EIA Scoping Area. It is anticipated that there will be some localised changes to the landscape character, particularly during construction. The overall sensitivity is medium. |

18.4.64 Table 18-29 demonstrates that the proposed Western Distribution Mains study area is characterised by an older population, fewer children, low levels of income deprivation, and low to moderate health and disability challenges, as well as a low population density.

Table 18-29: Prevalence of Vulnerable/Disadvantaged Groups in the Proposed Western Distribution Mains Study Area

| Vulnerable/Disadvantaged Groups               | Prevalence (relationship to national average)                                                                                                                                                              |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Older people (65 and over)                    | <b>High</b> – The LSOAs within the proposed Western Distribution Mains study area have a higher proportion (31.4%) of residents aged 65+ compared to the regional (20.0%) and national (18.7%) averages.   |
| Children (under 16)                           | <b>Low</b> – The LSOAs within the proposed Western Distribution Mains study area have a lower proportion (13.5%) of children aged under 16 compared to the regional (18.7%) and national (18.4%) averages. |
| Those with a high level of income deprivation | <b>Low</b> – The majority of LSOAs within the proposed Western Distribution Mains study area indicate relatively low levels of income deprivation. All LOSAs                                               |

| Vulnerable/<br>Disadvantaged<br>Groups                                                             | Prevalence (relationship to national average)                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                    | in study area are less deprived than 75% -76%) of neighbourhoods in England).                                                                                                                                                         |
| Those with pre-existing health conditions, such as cardiovascular disease and respiratory diseases | <b>Low</b> – From available health profile data for the MSOAs in the proposed Western Distribution Mains study area, there are no higher prevalences of conditions or hospital admissions when compared against the national average. |
| Those with disabilities and long-term health condition                                             | <b>Low</b> – The LSOAs within the proposed Western Distribution Mains study area have marginally more people (17%) who are disabled under the Equality Act 2010 compared to the regional (16.6%) and national (17.3%) averages.       |
| Population Density                                                                                 | <b>Low</b> – The MSOAs within the proposed Western Distribution Mains study area exhibit a low population density compared with the national average of 438 people per km <sup>2</sup> .                                              |

## Likely Significant Effects

18.4.65 The Proposed Development may give rise to likely significant effects on human population health through changes in the wider determinants of health. Assessment of the significance of human health effects at the level of individuals is not proportionate. Likely significant effects have been identified where there is a plausible source-pathway-receptor relationship and the potential to influence health outcomes or health inequalities. These effects are considered likely based on the application of the ISEP Guidance, which requires scoping to determine whether health effects are both ‘likely’ and ‘potentially significant’. This involves consideration of the following criteria:

- If there is a likelihood that there is a plausible source-pathway-receptor link through the probable given activities.
- If the effect is likely to be potentially significant.
- Understanding consultation responses.
- If committed mitigation avoids significant population health effects.

- Considering if committed enhancements maximise public health opportunity.

18.4.66 If determinants are considered likely to have a plausible direct and indirect pathway that have the potential to affect health outcomes and health inequalities, then they have been included in this assessment as having the potential for a likely significant effect.

18.4.67 Only health determinants proposed to be scoped in as relevant to the Proposed Development have been considered. These are grouped under the four domains identified in the ISEP Guidance, as follows:

- **Social environment:** housing; open space, leisure and play; transport modes, access, and connections; community identity, culture, resilience and influence; social participation, interaction and support; maritime navigation (construction); and community safety.
- **Economic environment:** employment and income (construction).
- **Bio-physical environment:** climate change mitigation and adaptation; air quality; water quality or availability (this refers to both impacts on potable water and nearby water course quality); and noise and vibration.
- **Institutional and built environment:** health and social care services; built environment; and wider societal infrastructure and resources.

## Construction Phase

### Social Environment

#### *Housing*

18.4.68 Housing will be considered within the residential and community receptor study areas in regard to potential effects on severance or disruptions to residential areas as a result of construction across the Proposed Development. This includes consideration of any requirement for temporary relocation during construction if required, changes to residential amenity, and effects on residents' ability to access local services, facilities and support networks.

18.4.69 Vulnerable groups, including older people, individuals with disabilities, and low-income households, may experience disproportionate effects,

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particularly in relation to disruption, accessibility, and reduced access to essential services.

- 18.4.70 Impacts on housing are anticipated to be largely temporary during the construction phase, they may be potentially significant where the intensity, frequency, or duration of disturbance is substantial.

*Open Space, Leisure and Play*

- 18.4.71 Open space, leisure and play will be considered in relation to potential effects on the population groups within both the health study area and the community receptor study area identified in the baseline conditions for all of the Proposed Development's components. The assessment will consider how construction activities may affect access to and usability of these facilities and spaces. Temporary restrictions, diversions or reduced accessibility may affect opportunities for physical activity, recreation and social interaction, with consequent implications for health and wellbeing. In addition, the amenity value and user experience of these spaces may be affected by factors such as increased traffic (including heavy goods vehicle movements), noise, dust, visual disturbance, and the presence of construction compounds or works in close proximity.
- 18.4.72 Impacts on open space, leisure and play during the construction phase are expected to be predominantly temporary but are potentially significant due to the intensity or duration of impact or where access is substantially constrained.

*Transport Modes Access and Connections*

- 18.4.73 The Proposed Development has the potential to generate likely significant effects on human health during the construction phase through changes to transport modes, access, and connections as shown in Figure 18-6. These effects may arise due to increased construction traffic, changes to the PRow network and disruptions to active travel and public transport routes.
- 18.4.74 These changes could lead to severance impacts affecting residential and community receptors, such as limiting access to key services and



destinations. This may also include specific impacts to critical health-related services, including emergency services, access to primary and secondary care and social care delivery due to restricted routes or increased congestion. There is also potential for impacts on the safety and attractiveness of walking and cycling routes, which may reduce levels of active travel.

- 18.4.75 The scale and plausibility of these impacts will be determined through the detailed baseline that will be provided in the human health chapter of the ES, which will include an assessment of relevant health and social care receptors. Impacts on transport modes access and connections during construction are expected to be predominantly temporary but are potentially significant due to the intensity or duration of impact.

#### *Resilience and Influence*

- 18.4.76 It is recognised that major infrastructure developments can influence mental health and wellbeing through changes in community resilience, perceived control and ability to influence decision making. Consultation with stakeholders has highlighted that, within Suffolk, communities are currently experiencing sustained exposure to multiple NSIPs. In this context, although not an NSIP, the Proposed Development may contribute to ongoing experiences of change and uncertainty and may reinforce perceptions of reduced influence over aspects of the local environment and future community conditions.
- 18.4.77 These factors are established determinants of health and wellbeing and may affect levels of stress, anxiety and community resilience at a population level, particularly where communities perceive limited ability to shape outcomes. While such effects are inherently variable, there is considered to be a plausible pathway between the Proposed Development, in cumulation with NSIPs, and effects on mental health and wellbeing.
- 18.4.78 The assessment will be undertaken qualitatively and will consider community perceptions, including the interaction between the Proposed Development and other major developments within the area.



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*Social Participation*

- 18.4.79 The Proposed Development also has the potential to influence mental health and wellbeing through effects on social participation, including opportunities for community interaction, engagement with local spaces, and participation in community activities. Stakeholder consultation has identified concerns that prolonged and overlapping infrastructure development activity may affect how communities use shared spaces and engage with one another over time.
- 18.4.80 Potential pathways include reduced participation in community activities due to changes in the local environment, disruption, or reduced amenity. Factors such as increased traffic, noise, dust, visual disturbance, and temporary access restrictions may discourage use of community spaces and facilities. This may, in turn, affect levels of social interaction, community cohesion, and sense of place. These effects may be more pronounced where construction activity is prolonged, geographically extensive, or occurs alongside other large-scale developments, giving rise to cumulative pressures. Vulnerable groups, including older people, young people, and those with limited access to private space, may be disproportionately affected.
- 18.4.81 While recognising the qualitative nature of these effects, there is considered to be a credible pathway to population-level wellbeing outcomes. Therefore, effects on social participation arising from the Proposed Development are to be scoped into the human health chapter of the ES. These will be assessed qualitatively for the Proposed Development, informed by stakeholder engagement and baseline evidence, and will include consideration of relevant cumulative influences on social participation and community cohesion.

*Maritime Navigation Impacts*

- 18.4.82 The construction phase of the Proposed Development's LSO component (Option 1) has the potential for likely significant effects on maritime navigation. These effects may result from the establishment of temporary

exclusion or safety zones, increased construction vessel movements, and interaction with established routes used by commercial, fishing and recreational users.

- 18.4.83 At this scoping stage, the design of the LSO component of the Proposed Development is evolving and would comprise one of three potential design options under consideration for the discharge of CRW from the Proposed Development. The final design of this component of the Proposed Development and its associated construction methodology will influence the nature and extent of potential impacts.
- 18.4.84 The construction of a new LSO (Option 1) is expected to represent a ‘cautious ‘worst case’’ scenario for maritime navigation impacts, due to the greater extent of offshore works required in comparison to Options 2 and 3. This in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026) [17] with reference to basing assessments on a ‘cautious ‘worst case’ approach’.
- 18.4.85 During construction of the proposed LSO component (Option 1), temporary increases in vessel movements, the establishment of safety or exclusion zones, and localised route deviations may give rise to a small increase in navigational risk, including the potential for collision or near-miss incidents between recreational users and other vessels.
- 18.4.86 These risks are anticipated to be low in magnitude and temporary during the duration of the construction period for the proposed LSO component (Option 1) but may be more relevant for recreational users (e.g. small craft) and smaller fishing vessels, which may be less familiar with operating in proximity to construction activities of restricted areas.
- 18.4.87 For recreational users, these changes may constrain access to areas used for sailing, angling, kayaking and other water-based activities. Temporary restrictions and rerouting may displace users to less suitable or more congested areas, affecting safety, confidence and overall user experience.

Perceptions of increased risk and construction activity may also discourage participation, particularly among less experienced users. In addition to physical navigational risk, the presence of construction vessels and restricted areas may result in increased perceived risk or anxiety among some marine users, particularly those with lower levels of experience. This may influence patterns of use or willingness to access marine recreational areas, with minor, temporary implications for wellbeing.

- 18.4.88 Where marine routes support coastal connectivity or regular recreation patterns, restrictions may reduce ease of movement or access to valued destinations, potentially leading to short term reductions in recreational use and time spent in blue space.
- 18.4.89 From a human health perspective, these impacts may lead to reduced opportunities for physical activity, relaxation and social interaction, alongside changes in perceived safety and enjoyment of the marine environment. There may also be indirect effects on wellbeing where local amenity or tourism is affected.
- 18.4.90 The introduction of temporary exclusion zones and construction activity may also result in minor, short-term changes to established marine access and navigation routes, including those used by emergency services such as the Royal National Lifeboat Institution ('RNLI').
- 18.4.91 While emergency response routes are expected to remain operational at all times, there is potential for minor localised delays or deviations during construction, giving rise to a negligible to low magnitude pathway for effects on community safety.
- 18.4.92 This will be managed through standard industry controls (e.g. Notices to Mariners, guard vessels, and stakeholder liaison), and therefore effects are expected to be temporary and not significant but are proposed to be scoped into the assessment for robustness.
- 18.4.93 The magnitude of effects will depend on the final design of the Proposed Development, extent and duration of construction activities, existing levels

of marine use, and the availability of alternative routes or locations.

Mitigation will likely include communication and coordination with marine users, in addition to navigational management measures, which is expected to reduce the level of potential impact.

- 18.4.94 Overall, temporary restrictions, displacement of users and changes to user experience present clear pathways to health and wellbeing effects. These impacts are therefore proposed to be scoped into the assessment in the human health chapter of the ES. The assessment will be refined as the design of the Proposed Development evolves, with consideration of the final design option and associated construction methodologies.

### *Community Safety*

- 18.4.95 The Proposed Development may influence community safety during the construction phase, primarily through increased traffic movements and associated accident risk. These impacts will also be considered in detail within the traffic and access chapter of the ES and cross-referenced within the human health chapter of the ES. These impacts are expected to be managed by a Construction Environment Management Plan ('CEMP'), in accordance with the Outline Construction Environmental Management Plan ('OCEMP') to be submitted in support of the DCO application. Additionally, construction activities may influence both actual and perceived safety within communities and therefore will be considered. Factors such as the presence of a transient construction workforce, the introduction of temporary construction compounds, changes in lighting, and altered patterns of movement may affect how safe individuals feel within their local environment, with potential implications for behaviour and wellbeing.
- 18.4.96 These potential effects may affect construction workers during the construction phase of the Proposed Development and existing residents living near, or adjacent to, the proposed Order Limits. Certain population groups, including children, older people, and individuals with disabilities, may be more sensitive to changes in safety or perceived risk.

18.4.97 While many effects are expected to be temporary, the potential for significant effects will be considered where exposure is prolonged or affects vulnerable groups.

### **Economic Environment**

#### *Employment and Income; Education and Training*

- 18.4.98 The Proposed Development has the potential to generate likely significant effects on human health during the construction phase through changes in employment and income alongside education and training with potential opportunities for upskilling within the Proposed Development's workforce. The construction phase may result in beneficial effects through increased job opportunities, local supply chain expenditure, and skills development. However, there is also potential for uneven distribution of benefits, with some local residents or businesses experiencing disruption (e.g. reduced accessibility, temporary loss of trade, or changes in local economic patterns).
- 18.4.99 Employment and income are recognised determinants of health and wellbeing, influencing factors such as financial security, living standards, and mental health outcomes.
- 18.4.100 This will be considered in detail within the socio-economics chapter of the ES and cross-referenced in the human health chapter of the ES. The potential effects may affect construction workers, resident and business in the surrounding area during the construction phase of the Proposed Development. Employment and income effects during construction are likely to be temporary but are potentially significant due to the likely magnitude of impact.

### **Bio-Physical Environment**

- 18.4.101 The Proposed Development has the potential to generate potentially significant effects during the construction phase through changes relating to bio-physical determinants of health. Potential pathways include:
- Climate change mitigation and adaptation.

- Air quality.
- Water quality and availability.
- Noise and vibration.

18.4.102 Without appropriate mitigation, impacts may arise across the Proposed Development during the construction phase, as discussed for each topic below.

#### *Climate Change Mitigation and Adaptation*

18.4.103 Construction activities may influence greenhouse gas emissions and local climate resilience, indirectly affecting health through increased vulnerability to heat stress or flooding. While these effects are primarily indirect, they may have implications for human health through increased vulnerability to climate-related risks such as heat stress or flooding.

#### *Air Quality*

18.4.104 Dust and emissions from plant and vehicle movements can exacerbate respiratory and cardiovascular conditions, particularly among certain population groups such as children, older adults and those with pre-existing health conditions.

#### *Water Quality and Availability*

18.4.105 Risk of water course contamination or reduced potable water availability could affect drinking water safety and hygiene, leading to potential gastrointestinal or other health impacts.

#### *Noise and Vibration*

18.4.106 Elevated noise levels and vibration can contribute to stress, sleep disturbance and associated mental and physical health outcomes.

18.4.107 Effects are likely to be greater for sensitive receptors, including nearby residents (especially at night), children in educational settings, older adults and those with pre-existing conditions, users of community facilities, and construction workers (who may also face risks such as hearing loss and vibration-related conditions).

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*Overall Consideration of Biophysical Determinants*

18.4.108 These determinants will be assessed in detailed within multiple corresponding ES chapters, and they will also be assessed collectively in the human health chapter of the ES. These bio-physical determinants are considered to have potential effects that may impact human health above and beyond those effects identified in other technical assessments due to potential impacts on sensitive receptors.

18.4.109 Potential population groups that may experience these effects include construction workers during the construction phase, residents living within or adjacent to the Order Limits, children and young people, older people, people with disabilities or existing health conditions, and users of community facilities, open spaces and local services. Impacts on the biophysical environment during the construction phase are expected to be predominantly temporary and related to the construction works themselves but are potentially significant due to the intensity or duration of impact.

**Institutional and Built Environment**

18.4.110 The Proposed Development may have potential for significant effects on human health relating to changes to the institutional and built environment during the construction phase. The institutional and built environment is defined within the ISEP Guidance as *‘factors pertaining to institutions for health-related care and illness prevention, other organisations and systems that influence communities and wider system resources that support public health’*. These factors are defined as health and social care services; built environment (e.g. spatial planning; community assets; social infrastructure and green space) and; wider societal infrastructure and resources (e.g. water infrastructure, energy infrastructure, transport infrastructure; waste management; communication and IT).

18.4.111 While access to these services will be addressed under the Social Environment: Transport Modes, Access and Connections determinant discussed above. This section instead focuses on potential impacts on service delivery and capacity for community receptors. In particular, it

considers the potential effects of the construction workforce on healthcare services, housing, and education provision. The key considerations are outlined below.

#### *Health and Social Care Services*

18.4.112 Increased demand generated by a large-scale construction workforce may place additional pressure on local healthcare facilities, potentially affecting accessibility and quality of care for existing residents. These would be considered temporary but may be significant depending on the scale and duration of impact.

#### *Built Environment*

18.4.113 Consideration will be given to the potential effects of temporary workforce accommodation and population influx on housing availability, including any implications for existing residents. Other aspects of the built environment including community assets, social infrastructure and green space will also be considered in relation to any land use impacts. These effects are expected to be temporary; however, their significance will depend on the scale and duration of impacts.

#### *Wider Infrastructure and Resources*

18.4.114 Disruption to utilities or community facilities may reduce access to essential services.

18.4.115 These potential effects may affect existing residents living near, or adjacent to, the proposed Order Limits. These are likely to be minor and localised but are proposed to be scoped into the assessment for robustness.

### **Operational Phase**

18.4.116 During the operational phase, the Proposed Development has the potential to generate likely significant effects relevant to human health linked to the following categories and wider determinants of health.



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### Social Environment

18.4.117 For effects assessed under the social environment determinant, the proposed AWRP, CSR and WSR components of the Proposed Development will be considered during the operational phase.

18.4.118 The Proposed Development's pipeline components and temporary works will not be considered here as it is assumed that access to this land will be restored prior to the commencement of the operational phase and are therefore proposed to be scoped out for the social environment determinant.

### *Open Space, Leisure and Play*

18.4.119 Open space, leisure and play will be considered in relation to potential effects on the community receptors identified in the baseline, the locations of which are shown in Figure 18-5. This will include consideration of impacts arising from the operational phase of the Proposed Development, such as the presence of operational infrastructure, changes in accessibility, or alterations to amenity (e.g. noise, odour or hydrology).

18.4.120 Vulnerable groups, including children and young people, older adults, and individuals with limited access to private outdoor space, may experience disproportionate effects, particularly in relation to reduced opportunities for recreation, physical activity, and social interaction.

18.4.121 This has been proposed to be scoped into the assessment in the human health chapter of the ES for robustness and will be considered within the assessment where relevant receptors are identified. Any effects identified would likely be considered permanent.

### *Transport Modes, Access and Connections*

18.4.122 The Proposed Development's relevant components which include the proposed AWRP, CSR and WSR have the potential for likely significant effects during the operational phase on human health in relation to transport modes, access and connections as shown in Figure 18-6. This may be due to operational traffic, changes to the PRow network, and disruptions to

active travel and public transport routes. These changes could lead to severance impacts affecting residential and community receptors, limiting access to key services and destinations. This may also include specific impacts to critical health-related services if identified as a relevant receptor, including emergency services, access to primary and secondary care and social care delivery due to restricted routes or increased congestion. Any effects identified would likely be considered permanent.

### *Community Safety*

18.4.123 Under ‘social environment’, potentially significant effects on community safety will also be considered, primarily in relation to impacts on traffic accidents during the Proposed Development’s operational phase. This is likely to be most relevant to the proposed AWRP, CSR and WSR components of the Proposed Development due to potential increased traffic flows, which may influence the risk of road traffic accidents and perceptions of safety for those using local roads and active travel routes.

18.4.124 The operational safety of the Proposed Development itself will not be considered in the human health chapter of the ES as it will be assessed in the major accidents and disasters chapter of the ES.

18.4.125 These potential effects may affect nearby residents and other population groups using local roads and active travel routes, including pedestrians, cyclists and more vulnerable users such as children, older people and people with disabilities. Effects are expected to be minor and localised but are proposed to be scoped into the assessment for robustness.

### *Bio-Physical Environment*

18.4.126 Without mitigation, operational activities may have the potential to generate likely significant effects with direct and indirect effects on human health. These are outlined below.

### *Climate Change Mitigation and Adaptation*

18.4.127 The operational phase of the Proposed Development has the potential to generate likely significant beneficial effects associated with resilience to

drought and water scarcity. There may also be the potential for likely significant effects linked with operational energy demands and emissions for pumping, treatment and distribution that may contribute to climate-related health risks such as heat stress, flooding and vector-borne disease prevalence. The human health assessment will consider both beneficial and adverse pathways.

#### *Air Quality*

18.4.128 Air quality will be considered in relation to potential operational effects arising from the Proposed Development. While impacts are expected to be lower than during the construction phase, emissions from operational traffic (e.g. maintenance and servicing) and odour from treatment processes may influence local air quality and amenity, particularly in the vicinity of the proposed AWRP component.

18.4.129 Emissions from operational traffic movements (e.g. maintenance and servicing) and odour emissions from treatment processes could affect respiratory and cardiovascular health and perceived air quality, particularly for sensitive receptors near the proposed AWRP component of the Proposed Development. Odour-related nuisance may also contribute to stress and reduced quality of life for nearby receptors.

#### *Water Quality and Availability*

18.4.130 Potable water quality and availability is a critical objective of the Proposed Development. The operational phase of the Proposed Development is likely to generate significant beneficial effects on water security, reducing health risks associated with scarcity and supporting resilience during droughts. This is particularly important as East Anglia is identified as a 'seriously water stressed area'. This has both physical and mental health impacts on population and human health outcomes such as reduced food security, mental health effects and increased vector-borne diseases.

18.4.131 Water recycling schemes in the UK are subject to stringent regulatory controls to ensure that water intended for human consumption remains safe and wholesome. All water recycling process must comply with the Water

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Industry Act 1991 [18] and the Water Supply (Water Quality) Regulations 2016 (as amended) [19], which set legally enforceable standards for drinking water quality. Oversight is provided by the Drinking Water Inspectorate to ensure compliance with obligations relating to water quality and sufficiency.

18.4.132 These regulations require water to meet strict health-based standards for microbiological, chemical and physical parameters, with additional safeguards to prevent any substances that could pose a risk to human health.

18.4.133 Given the above, effects on potable water availability will be considered under ‘Institutional and Built Environment’ for the assessment of likely significant effects during the Proposed Development’s operational phase.

18.4.134 Risks to water course contamination from the operation of the Proposed Development will be considered in relation to human health if identified as a significant risk in the relevant technical assessment in the ES.

#### *Noise and Vibration*

18.4.135 Operational noise sources may arise from water pumping and treatment facilities in addition to vehicle movements. While likely to be of a lower magnitude compared to construction noise and vibration impacts, persistent exposure to has the potential to significantly affect human health through sleep disturbance, stress and anxiety and cardiovascular effects over prolonged periods.

18.4.136 Sensitive receptors such as nearby residents, including vulnerable groups, schools, care homes and healthcare facilities may be most affected.

#### *Overall Consideration of Biophysical Determinants*

18.4.137 These determinants will be assessed in detail within multiple corresponding ES chapters, and they will also be assessed collectively in the human health chapter of the ES. These bio-physical determinants are considered to have potential effects that may impact sensitive human health above and

beyond those effects identified in other technical assessments (e.g. air quality, noise) due to potential impacts on sensitive receptors. However, each bio-physical determinant will only be included in the assessment of likely significant effects in the human health chapter of the ES if it is also scoped into the relevant technical assessment in the ES.

18.4.138 Potential effects may affect existing residents living near, or adjacent to, the Proposed Development.

### **Institutional and Built Environment (wider societal infrastructure and resources)**

18.4.139 The Proposed Development may have potential for significant effects relating to the institutional and built environment during the operational phase. Relevant institutional and built environment receptors are identified in Figure 18-7 and have been considered as part of this assessment. The Proposed Development has the potential to increase the resilience of water supply systems in the East of England region, reducing reliance on freshwater sources, supporting long-term water security for households, businesses and critical services such as hospitals, schools and energy facilities. This improved resilience can help safeguard public health during periods of drought to climate-related stress, reducing risks associated with water scarcity or service disruption.

### **Decommissioning**

#### *Bio-Physical Environment (Climate Change Mitigation and Adaptation; Air Quality; Water Quality or Availability; Land Quality and Noise and Vibration)*

18.4.140 The Proposed Development has the potential for likely significant effects on human health relating to the above bio-physical determinants during the decommissioning phase across all of its components. These determinants will be assessed in multiple separate ES chapters, and they will also be assessed collectively in the human health chapter of the ES. Each bio-physical determinant will only be included in the assessment of likely significant effects if it is also scoped into the relevant technical assessment in the ES.

18.4.141 These potential effects may impact existing residents living near, or adjacent to, the Proposed Development.

## 18.5 Impacts Scoped Out of the Assessment

18.5.1 It is considered that there would be no likely significant standalone human health effects under the following wider determinants during the Proposed Development's construction, operational and decommissioning phases that would be able to be identified through the source-pathway-receptor link:

- **Health related behaviours:** physical activity; risk taking behaviour; diet and nutrition (proposed to be scoped out of the assessments of the Proposed Development's construction, operational and decommissioning phases).
- **Social environment:** housing and relocation (proposed to be scoped out of the assessment of the Proposed Development's operational and decommissioning phases); community identity, culture, resilience and influence; social participation, interaction and support (all proposed to be scoped out of the assessments of the Proposed Development's operational and decommissioning phases); housing, community safety, and transport modes and connections (proposed to be scoped out of the assessment of the Proposed Development's decommissioning phase only); and maritime navigation (proposed to be scoped out of the assessment of the operational and decommissioning phases of the Proposed Development).
- **Economic environment:** employment and income (proposed to be scoped out of the assessments of the Proposed Development's operational and decommissioning phases); and education and training (scoped out of the assessments of the Proposed Development's operational and decommissioning phases);
- **Bio-physical environment:** land quality; radiation (scoped out of the assessments of the Proposed Development's construction, operational and decommissioning phases).
- **Institutional and Built Environment:** health and social care services; built environment (scoped out of the assessments of the operational and decommissioning phases of the Proposed Development).

### *Health Related Behaviours*

18.5.2 Health related behaviours are not expected to be subject to potentially significant effects during the construction, operational, or decommissioning phases of the Proposed Development. This is because no direct or material population-level causal pathway has been identified linking the Proposed

Development to changes in behaviours such as physical activity, diet, or substance use, beyond those already captured under other determinants. Factors influencing health-related behaviours, such as access to PRow affecting physical activity, are assessed under 'Transport Modes, Access and Connections' within the 'Social Environment' determinant and are therefore not considered separately here.

### *Social Environment*

- 18.5.3 The remaining social environment considerations are proposed to be scoped out of the human health assessment within the ES. Relocation is proposed to be scoped out of the construction, operational and decommissioning phase assessments, as no individual properties are expected to be demolished as part of the Proposed Development and therefore significant effects relating to displacement or loss of housing are not anticipated. Community identity, culture, resilience and influence, and social participation, interaction and support are proposed to be scoped out of the assessments of the Proposed Development's operational and decommissioning phases, as any effects on community cohesion, participation or social networks are expected to be temporary and primarily associated with construction activities. In addition, housing, community safety, and transport modes and connections are proposed to be scoped out of the assessment of the Proposed Development's decommissioning phase, as decommissioning activities are not expected to result in likely significant effects on these determinants.

### *Maritime Navigation*

- 18.5.4 Impacts on maritime navigation from the proposed LSO component during the operational phase are anticipated to be minimal. The design of this component of the Proposed Development is evolving, with three options for the discharge of CRW under consideration. A new LSO (Option 1) represents a '*cautious 'worst case' approach*' in line with the principle of the 'Rochdale Envelope' and in accordance with the Planning Inspectorate's NSIPs: Pre-Application Advice on Environmental Impact Assessment (July



2026) [20], although even for Option 1, long-term impacts are expected to be limited once construction has been completed.

- 18.5.5 The proposed LSO component (Option 1) during the operational phase is not expected to require ongoing exclusion zones or materially alter established navigation routes for commercial or recreational users. Standard navigational safety measures, including appropriate marking and charting, are expected to ensure that the presence of the structure does not create substantive constraints on access or movement within the waterway. As such, recreational activities including sailing and small craft use are expected to continue largely unchanged.
- 18.5.6 From a health and wellbeing perspective, no meaningful pathways to impact are identified. Access to recreational waters, user experience, and opportunities for physical activity and social interaction are expected to be maintained. During the Proposed Development's decommissioning phase, the LSO component is anticipated to remain in situ and therefore is not expected to introduce additional navigation or access impacts.
- 18.5.7 On this basis, these effects are proposed to be scoped out of the assessment in the human health chapter of the ES. However, this approach will be reviewed as the design of the Proposed Development evolves, to confirm that no significant effects would arise from the final design of the Proposed Development.

### *Economic Environment*

- 18.5.8 Education and training are proposed to be scoped out of the human health assessment for the operational and decommissioning phases as the Proposed Development is not expected to generate a substantial number of education and training opportunities sufficient to result in a likely significant health effect. Although some opportunities, such as apprenticeships, skills development and educational engagement activities, may be generated during the operational and decommissioning phases, these are not anticipated to be of a magnitude that would give rise to significant standalone human health effects. Such measures will be considered



through the Outline Skills and Employment Plan ('OSEP') submitted in support of the DCO application.

- 18.5.9 The Proposed Development has the potential to influence human health during the construction, operational and decommissioning phases in relation to employment and income, recognising that employment is an important determinant of health and wellbeing. However, effects during the operational and decommissioning phases are expected to be negligible due to the limited and short-term nature of employment opportunities during these phases. Overall, it is considered unlikely that the Proposed Development would give rise to significant effects in this respect.
- 18.5.10 On this basis, employment and income, and education and training effects are proposed to be scoped into the assessment for the construction phase only and scoped out for the operational and decommissioning phases.

#### *Bio-Physical Environment*

- 18.5.11 In relation to the Bio-Physical Environment, it is considered that land quality should be scoped out of this assessment for all phases as it will be adequately considered in the agricultural land and soils chapter of the ES, with limited additional human health impacts. Regarding radiation, this is considered outside of the scope of the human health assessment due to the nature of the Proposed Development.

#### *Institutional and Built Environment: Health and Social Care Services; Built Environment*

- 18.5.12 In relation to the Institutional and Built Environment, both health and social care services and built environment facilities identified in Figure 18-7 are not considered to have likely significant effects due to the lack of causal pathways between the Proposed Development and the receptors considered. The proposed pipeline components and temporary works are proposed to be scoped out of the assessment in the human health chapter of the ES as it is assumed that access to this land will be restored prior to the commencement of the Proposed Development's operational phase.

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## 18.6 Proposed Approach to Mitigation

### Primary (Inherent) Mitigation

- 18.6.1 Through the design evolution, balanced judgements will be taken on the locations of the infrastructure for the Proposed Development. Mitigation measures will be developed through this process and as the Proposed Development is refined and will be incorporated into the ES as per the agreed mitigation hierarchy.
- 18.6.2 It is expected that where practicable, the Proposed Development would adhere to good principles of construction to reduce the impact on human health. Examples of such considerations include:
- Incorporation of trenchless crossings to minimise construction impact.
  - Minimising the requirement for diversions and stopping up of PRow, cycle paths and other active travel routes.

### Secondary (Foreseeable) Mitigation

- 18.6.3 A Construction Worker Travel Plan will be implemented to minimise environmental impacts during the construction phase. It will be in accordance with the Framework Construction Worker Travel Plan ('FCWTP') to be submitted in support of the DCO application and to be secured by DCO requirement and include measures such as designated haulage routes, scheduled delivery times for heavy loads, and pre-determined vehicle types to ensure safe and efficient transport. Construction traffic will operate within agreed working hours where practicable, with efforts made to reduce disruption to the local road network and nearby residents, including at night.
- 18.6.4 Institute of Air Quality Management ('IAQM') guidance provides a number of potential mitigation measures to reduce air quality impacts during construction, operational and decommissioning phases of a proposed development. A full list of these mitigation measures to be implemented for the Proposed Development is provided in chapter 15 air quality and odour.

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- 18.6.5 A Stakeholder Communications Plan will be developed and implemented, including community engagement, prior to commencement of construction and decommissioning works.
- 18.6.6 An OSEP will be implemented to facilitate positive and meaningful commitments and activities. It is likely to be implemented within the East of England by the Applicant with respect to employment and skills. The OSEP will be developed with key stakeholders. The OSEP is likely to include measures that ensure employment opportunities benefit local and regional populations, where possible.
- 18.6.7 The design of the Proposed Development is yet to be finalised. However, the following measures would also be considered:
- Where practicable, access to public open spaces and green infrastructure should be enhanced.
  - Improved connectivity through increasing accessibility to active travel routes should be enhanced.
- 18.6.8 Further mitigation measures may be identified during the preparation of the human health chapter of the ES.

### **Tertiary (Inexorable) Mitigation**

- 18.6.9 The following tertiary mitigation measures would be implemented for the Proposed Development which would minimise impact on human health.
- A CEMP will be prepared prior to the commencement of works to ensure best practice is followed and the environment is safeguarded. It will be in accordance with the OCEMP to be submitted in support of the DCO application and to be secured by DCO requirement. The CEMP will include method statements for the proposed works, details of materials to be transported to and from the proposed Order Limits, and a pollution control and contingency plan. It is expected to include consideration of how changes to PRoW will be managed, reinstated, re-provided and improved to reduce disruption and ensure access is maintained as far as possible. The CEMP will be implemented during each phase of construction to mitigate adverse impacts arising from excavation and building activities. The relevant LPAs would approve of the detailed CEMP prior to the commencement of construction activities. For the decommissioning phase of the Proposed Development, a Decommissioning Environmental Management Plan ('DEMP') will be

prepared prior to the commencement of works to ensure best practice is followed and the environment is safeguarded. It will be in accordance with the Outline Decommissioning Environmental Management Plan ('ODEMP') to be submitted in support of the DCO application and to be secured by DCO requirement.

- Standard maritime risk management measures will be implemented, including clearly defined exclusion zones, Notices to Mariners, guard vessels, and ongoing liaison with marine users and emergency responders (including the RNLI, where relevant). These measures will ensure that navigational risks, including collision risk, are reduced to as low as reasonably practicable.

## 18.7 Proposed Approach to the ES

### Best Practice Guidance

- 18.7.1 As referenced above in Section 18.1, the ISEP Guidance will be used as the basis of the assessment methodology for the human health chapter of the ES.

### Assessment Methodology

- 18.7.2 This section sets out the proposed methodology for the assessment of the direct and indirect likely significant effects on human health in the ES. This is based on professional judgement and previous experience, together with the ISEP Guidance outlined above.
- 18.7.3 For the purposes of this assessment, health is defined according to the World Health Organisation ('WHO') definition, in that it '*...is a state of complete physical, social and mental wellbeing and not simply the absence of disease or infirmity.*' This definition is two-fold in that human health is framed positively and comprehensively as a concept encompassing physical health, mental health, and social wellbeing, while also highlighting the importance of minimising disease and illness.
- 18.7.4 This definition of health reflects the understanding that an individual's inherited traits interact with lifestyle, community, environmental, social, and economic factors, as well as a much wider range of issues to determine their health outcomes, as shown in Figure 18-1, which illustrates a 'wider determinants of health' model [21].



Figure 18-1: The Health Map - Wider Determinants of Health and Wellbeing (Barton and Grant 2006 - adapted from Dahlgren and Whitehead 1991)

- 18.7.5 The human health assessment will involve a desk-based investigation of health and wellbeing conditions and potential impacts associated with the Proposed Development. The assessment will seek to identify likely significant effects on relevant population groups in relation to the wider determinant of health.
- 18.7.6 Health determinants considered in the assessment are deemed to be possible where a relevant source-pathway-receptor linkage has been identified during the scoping analysis. The Proposed Development will be assessed against each of the scoped-in determinants to identify potentially significant beneficial and adverse effects across different receptor groups.
- 18.7.7 Effects will be considered, as appropriate, during the construction, operational and decommissioning phases, considering the likely environmental effects of the Proposed Development. The assessment will also identify any further mitigation and enhancement measures to be implemented, where relevant.
- 18.7.8 Additionally, effects will primarily be considered at the population level, rather than the individual level, when determining significance. However, some health determinants and population characteristics require

consideration of specific population groups and local areas to understand potential vulnerabilities and health inequalities. Professional judgement has therefore been applied to ensure that relevant health pathways and population groups are appropriately considered. Whilst localised impacts may arise, conclusions on significance are based on population-level health outcomes and are considered proportionate to the scale and nature of the Proposed Development.

18.7.9 It is important to note here that the UKHSA approach taken is to minimise health risks of schemes and there may still be health effects felt of impacts (such as changes to air quality) at levels below statutory standards. Effects assessed in the human health chapter of the ES will utilise standards referenced in technical assessments when assigning significance.

18.7.10 The human health chapter of the ES will draw upon assessments from other technical chapters and supporting documents within the ES where there is relevance to human health.

18.7.11 The human health assessment will largely be qualitative, except where data is readily available to enable quantification or where quantification of health impacts is undertaken in other assessments included within the ES.

### Effect Significance Criteria

18.7.12 The assessment of effect significance is a function of receptor sensitivity and impact magnitude that accounts for a range of contextual information, comprising:

- Scientific literature.
- Baseline conditions for the population.
- Consultation for the Proposed Development.
- Health priorities & policy context in relevant national and local authorities' jurisdiction.
- Regulatory standards.

18.7.13 Effects that are described as ‘minor’ or ‘negligible’ are determined to be ‘not significant’ and effects that are described as ‘moderate,’ or ‘major’ are determined to be ‘significant.’

### Sensitivity of Receptors

18.7.14 The criteria used to determine receptor sensitivity is set out in Table 18-30 and follows the ISEP Guidance. Judgement is based on most relevant criteria; it is likely that analysis may span multiple categories. Population sensitivity may be driven by one or more criteria.

Table 18-30: Receptor Sensitivity

| Receptor Sensitivity | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                 | High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the Proposed Development); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt. |
| Medium               | Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.                               |
| Low                  | Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.                                       |
| Very Low             | Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.                                             |



## Impact Magnitude

- 18.7.15 The criteria used to determine impact magnitude is set out in Table 18-31 and follows the ISEP Guidance. Judgement is based on most relevant criteria; it is likely that analysis may span multiple categories and magnitude of change may be driven by one or more criteria.

Table 18-31: Impact Magnitude Criteria

| Impact Magnitude | Criteria                                                                                                                                                                                                                                                                                                |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High             | High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications. |
| Medium           | Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.                                   |
| Low              | Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.                                |
| Negligible       | Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.                                                    |

## Effect Significance

- 18.7.16 The indicative matrix used to determine effect significance is set out in Table 18-32. These effects may be adjusted to reflect contextual information, from sources as listed above. Effects are deemed to be adverse or beneficial and major, moderate, minor or negligible.



18.7.17 Effect significance is determined by combining a professional judgement regarding both the sensitivity and magnitude criteria outlined above. This is based on the data assessed in the baseline (including health inequalities, demographic trends, deprivation and service capacity), coupled with the likely duration, scale, frequency and severity of effect. These combine to determine significance. Often, this will be based on a qualitative judgement, but where possible these will be quantified.

Table 18-32: Effect Significance Matrix

|           |            | Sensitivity      |                  |                |                  |
|-----------|------------|------------------|------------------|----------------|------------------|
|           |            | High             | Medium           | Low            | Very Low         |
| Magnitude | High       | Major            | Major/moderate   | Moderate/minor | Minor/negligible |
|           | Medium     | Major/moderate   | Moderate         | Minor          | Minor/negligible |
|           | Low        | Moderate/minor   | Minor            | Minor          | Negligible       |
|           | Negligible | Minor/negligible | Minor/negligible | Negligible     | Negligible       |

## Mitigation and Residual Effects

18.7.18 The determination of significance will consider all committed or secured primary, secondary, and tertiary mitigation and/or enhancement measures. Any assumptions regarding the effectiveness of mitigation will be set out in the assessment methodology. However, for the purposes of the assessment, it will be assumed that the mitigation is effective, and residual effects will be assessed as such.

## In-combination Effects

18.7.19 The proposed methodology for the human health assessment will consider in-combination and downstream effects.

18.7.20 As noted above, the human health assessment will be developed in conjunction with the following assessments in the ES: water environment, traffic and access, noise and vibration, air quality and odour, socio-economics and climate change. Therefore, all assessments under bio-

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physical and social environment (transport, access modes and connections and community safety) should be considered in-combination effects.

18.7.21 Additionally, across bio-physical, social environment and the institutional and built environment determinants, relevant residential and community receptors identified will also be considered in-combination with the above disciplines.

18.7.22 The downstream effects from the Proposed Development on human health are to be considered under the operational phase assessment of the institutional and built environment determinant as this will consider the impact of the Proposed Development on societal infrastructure that has impacts on wider determinants of health, including access to services.

18.7.23 As set out in chapter 3 EIA methodology, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within the cumulative effects assessment chapter the ES.

### **Limitations and Assumptions**

18.7.24 The human health assessment relies on a number of other technical assessments in the ES, and the scoping of specific determinants may rely on further information from other disciplines. This includes surveys that these disciplines rely on.

18.7.25 The Broads Authority does not represent a standalone administrative geography for the baseline datasets used within the human health assessment. Relevant population and health baseline data are therefore captured through the underlying local authority areas and supplemented by smaller-area analysis where appropriate.

18.7.26 The human health assessment is primarily a qualitative, desk-based assessment regarding the wider determinants of health that should not be taken as a bio-medical or epidemiological study.

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18.7.27 Health and Safety considerations regarding the construction, operational and decommissioning phases of the Proposed Development are not part of this assessment.

18.7.28 Data is primarily drawn from publicly availability sources.

## **18.8 Summary of Impacts and Effects**

18.8.1 Table 18-33 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the human health chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 18-33: Summary of Human Health Scope

| Receptor                                         | Effects                                                                               | Anticipated Magnitude | Anticipated Importance/Sensitivity                        | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/ Scoped out |
|--------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------|------------------------------------------------|----------------------------|-----------------------|
| <b>Construction Phase</b>                        |                                                                                       |                       |                                                           |                                                |                            |                       |
| Physical activity (health related behaviour)     | Impact on population level physical activity.                                         | Very Low              | High - Low depending on baseline level of activity.       | Not Significant                                | None required.             | Scoped out            |
| Risk taking behaviour (health related behaviour) | Impact on population level safety behaviours.                                         | Very Low              | Low                                                       | Not Significant                                | None required.             | Scoped out            |
| Diet and nutrition (health related behaviour)    | Impact on population level diet.                                                      | Very Low              | High - Low depending on baseline level of healthy eating. | Not Significant                                | None required.             | Scoped out            |
| Land quality (bio-physical environment)          | Receptors may be impacted by changes to land quality for example for food production. | High - Low            | High - Low                                                | Not Significant                                | None required.             | Scoped out            |
| Radiation (bio-physical environment)             | Receptors may be impacted in changes to                                               | Low                   | High - Low                                                | Not Significant                                | None required.             | Scoped out            |

| Receptor                                                                   | Effects                                                                                                                                              | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                         | Scoped in/ Scoped out |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                            | baseline radiation levels.                                                                                                                           |                       |                                    |                                                |                                                                                                                                                                    |                       |
| Housing (social environment)                                               | Receptors may be impacted by severance.                                                                                                              | High - Low            | High                               | Significant                                    | Implementation of measures set out in the OCEMP and FCWTP.                                                                                                         | Scoped in             |
| Relocation (social environment)                                            | Receptors may be impacted by location of the Proposed Development.                                                                                   | Low                   | High                               | Significant                                    | No mitigation is proposed at this scoping stage, as the need for relocation and the potential scale of any displacement have yet to be confirmed.                  | Scoped in             |
| Community identity, culture, resilience and influence (social environment) | Receptors may be impacted by real and perceived impact on community cohesion and wellbeing from cumulative impact with NSIPs in Suffolk and Norfolk. | High - Low            | High - Low                         | Significant (cumulative effect)                | Commitments within the Stakeholder Communications Plan and community engagement strategy; phasing and co-ordination of construction activities, where practicable. | Scoped in             |
| Social participation,                                                      | Receptors may be impacted by real and                                                                                                                | High - Low            | High - Low                         | Significant (cumulative effect)                | Engagement Strategy; Measures set out in Stakeholder                                                                                                               | Scoped in             |

| Receptor                                     | Effects                                                                                                                                                                                                                                                                                     | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                          | Scoped in/ Scoped out |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| interaction and support (social environment) | perceived levels of influence on the Proposed Development.                                                                                                                                                                                                                                  |                       |                                    |                                                | Communications Plan; maintenance of access to community facilities where practicable.                                                                                               |                       |
| Maritime Navigation                          | Temporary increase in navigational activity and restrictions (including exclusion zones), leading to low-level increases in collision risk, potential minor disruption to recreational and commercial marine users, and limited interaction with emergency response routes (e.g. the RNLI). | High - Low            | High - Low                         | Significant                                    | Application of standard marine safety controls; implementation of agreed maritime management and communication measures (e.g. Notices to Mariners, exclusion zones where required). | Scoped in             |

| Receptor                                               | Effects                                                                  | Anticipated Magnitude | Anticipated Importance/<br>Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                               | Scoped in/<br>Scoped out |
|--------------------------------------------------------|--------------------------------------------------------------------------|-----------------------|----------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------|
| Open space, leisure and play (social environment)      | Receptors may be impacted by severance.                                  | High - Low            | High - Low                             | Significant                                    | Implementation of measures set out in the FCWTP.                                                         | Scoped in                |
| Transport, modes, and connections (social environment) | Receptors may be impacted by diversions and severance.                   | High - Low            | High - Low                             | Significant                                    | Implementation of measures set out in the FCWTP.                                                         | Scoped in                |
| Community safety (social environment)                  | Receptors may be impacted by traffic changes and construction workforce. | High - Low            | High - Low                             | Significant                                    | Implementation of measures set out in the FCWTP.<br>Measures set out in Stakeholder Communications Plan. | Scoped in                |
| Employment and income (economic environment)           | Receptors may be impacted by opportunities to access employment.         | High                  | High - Low                             | Significant                                    | Implementation of measures set out in the OSEP.                                                          | Scoped in                |
| Education and training (economic environment)          | Receptors may be impacted by opportunities to access                     | High                  | High - Low                             | Significant                                    | Implementation of measures set out in the OSEP.                                                          | Scoped in                |

| Receptor                                                            | Effects                                                                                                                           | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                              | Scoped in/ Scoped out |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                     | education and training.                                                                                                           |                       |                                    |                                                |                                                                                                                         |                       |
| Climate change mitigation and adaptation (bio-physical environment) | Receptors may be impacted by changes to climate such as flooding or drought that interact with the Proposed Development.          | High                  | High - Low                         | Significant                                    | Potential mitigation within the EIA Scoping Area may be required, subject to the findings of the technical assessments. | Scoped in             |
| Air quality (bio-physical environment)                              | Receptors may be impacted by air pollution and dust changes.                                                                      | High - Low            | High - Low                         | Significant                                    | Implementation of measures set out in the OCEMP.                                                                        | Scoped in             |
| Water quality or availability (bio-physical environment)            | Receptors may be impacted by changing levels of access to potable water and risks to water contamination of nearby water sources. | High - Low            | High - Low                         | Significant                                    | Implementation of measures set out in the OCEMP.                                                                        | Scoped in             |



| Receptor                                                              | Effects                                                                                 | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                   | Scoped in/ Scoped out |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Noise and vibration (bio-physical environment)                        | Receptors may be impacted by construction noise.                                        | High - Low            | High - Low                         | Significant                                    | Implementation of measures set out in the OCEMP.                                                                                                                                                                                                             | Scoped in             |
| Health and social care services (institutional and built environment) | Receptors may be impacted by increased demand for services.                             | High                  | High                               | Significant                                    | No mitigation is proposed at this stage as the nature and scale of any increased demand on health and social care services has not yet been quantified. This will be assessed through the EIA process and appropriate mitigation identified where necessary. | Scoped in             |
| Built environment (institutional and built environment)               | Receptors including housing and community infrastructure may be impacted due to access. | High - Low            | High - Low                         | Significant                                    | Implementation of measures set out in FCWPT.                                                                                                                                                                                                                 | Scoped in             |
| Wider societal infrastructure and resources                           | Receptors may be impacted by increased                                                  | Moderate - Low        | High                               | Significant                                    | No mitigation is proposed at this stage as the scale of any                                                                                                                                                                                                  | Scoped in             |

| Receptor                                         | Effects                                       | Anticipated Magnitude | Anticipated Importance/Sensitivity                        | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                           | Scoped in/ Scoped out |
|--------------------------------------------------|-----------------------------------------------|-----------------------|-----------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| (institutional and built environment)            | demand on services.                           |                       |                                                           |                                                | increased demand on wider societal infrastructure and resources is not yet known. This will be assessed through the EIA process and appropriate mitigation developed where required. |                       |
| <b>Operational Phase</b>                         |                                               |                       |                                                           |                                                |                                                                                                                                                                                      |                       |
| Physical activity (health related behaviour)     | Impact on population level physical activity. | Very Low              | High - Low depending on baseline level of activity.       | Not Significant                                | None required.                                                                                                                                                                       | Scoped out            |
| Risk taking behaviour (health related behaviour) | Impact on population level safety behaviours. | Very Low              | Low                                                       | Not Significant                                | None required.                                                                                                                                                                       | Scoped out            |
| Diet and nutrition (health related behaviour)    | Impact on population level diet.              | Very Low              | High - Low depending on baseline level of healthy eating. | Not Significant                                | None required.                                                                                                                                                                       | Scoped out            |
| Housing                                          | Receptors may be impacted by                  | Very Low              | High                                                      | Not Significant                                | None required.                                                                                                                                                                       | Scoped out            |

| Receptor                                                                   | Effects                                                                                          | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/ Scoped out |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|----------------------------|-----------------------|
| (social environment)                                                       | temporary severance.                                                                             |                       |                                    |                                                |                            |                       |
| Relocation (social environment)                                            | Receptors may be impacted by location of Proposed Development.                                   | Low                   | High                               | Not Significant                                | None required.             | Scoped out            |
| Community identity, culture, resilience and influence (social environment) | Receptors may be impacted by real and perceived impact on community cohesion.                    | High - Low            | High - Low                         | Not Significant                                | None required.             | Scoped out            |
| Social participation, interaction and support (social environment)         | Receptors may be impacted by real and perceived levels of influence on the Proposed Development. | High - Low            | High - Low                         | Not Significant                                | None required.             | Scoped out            |
| Education and training (economic environment)                              | Receptors may be impacted by opportunities to access                                             | High - Low            | High - Low                         | Not Significant                                | None required.             | Scoped out            |

| Receptor                                                              | Effects                                                                                             | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                          | Scoped in/ Scoped out |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|
|                                                                       | education and training.                                                                             |                       |                                    |                                                |                                                                                                     |                       |
| Employment and income (economic environment)                          | Receptors may be impacted by opportunities to access employment.                                    | High - Low            | High - Low                         | Not Significant                                | None required.                                                                                      | Scoped out            |
| Health and social care services (institutional and built environment) | Receptors may be impacted by need for water resources.                                              | Moderate - Low        | High                               | Not Significant                                | None required.                                                                                      | Scoped out            |
| Built environment (institutional and built environment)               | Receptors considered, housing and other community receptors, unlikely to be significantly affected. | High - Low            | High - Low                         | Not Significant                                | None required.                                                                                      | Scoped out            |
| Open space, leisure and play (social environment)                     | Receptors may be impacted by severance.                                                             | High - Low            | High - Low                         | Significant                                    | No mitigation is proposed at this scoping stage as the design of the Proposed Development is yet to | Scoped in             |

| Receptor                                               | Effects                                                | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                 | Scoped in/ Scoped out |
|--------------------------------------------------------|--------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                        |                                                        |                       |                                    |                                                | be finalised and the nature and extent of any severance effects are not yet known. However, where practicable, access to public open spaces and green infrastructure will be enhanced.                                                                                                     |                       |
| Transport, modes, and connections (social environment) | Receptors may be impacted by diversions and severance. | High - Low            | High - Low                         | Significant                                    | No mitigation is proposed at this scoping stage as the design of the Proposed Development is yet to be finalised and the nature and extent of any severance effects are not yet known. However, where practicable, access to public open spaces and green infrastructure will be enhanced. | Scoped in             |
| Community safety (social environment)                  | Receptors may be impacted by traffic changes           | High - Low            | High - Low                         | Significant                                    | Measures set out in Stakeholder Communications Plan.                                                                                                                                                                                                                                       | Scoped in             |

| Receptor                                                            | Effects                                                                                                                                   | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage                               | Likely Mitigation Measures                                                                                                                                                                                              | Scoped in/ Scoped out |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                     | and construction workforce.                                                                                                               |                       |                                    |                                                                              |                                                                                                                                                                                                                         |                       |
| Climate change mitigation and adaptation (bio-physical environment) | Receptors may be impacted by changes to climate such as flooding or drought that interact with the Proposed Development.                  | High                  | High - Low                         | Significant                                                                  | Potential mitigation within the EIA Scoping Area may be required, subject to the findings of the technical assessments.                                                                                                 | Scoped in             |
| Air quality (bio-physical environment)                              | Receptors may be impacted by air pollution and dust changes.                                                                              | High - Low            | High - Low                         | Significant                                                                  | Potential mitigation within the EIA Scoping Area may be required, subject to the findings of the technical assessments.                                                                                                 | Scoped in             |
| Water quality or availability (bio-physical environment)            | Receptors may be impacted by risks to watercourse contamination (impacts on levels of water availability, 'potable' water, are considered | High - Low            | High - Low                         | Significant (but assessed under wider societal infrastructure and resources) | No mitigation is proposed at this stage as the design of the Proposed Development is yet to be finalised and the scale of any effects on water quality or availability is not yet known. Appropriate mitigation will be | Scoped In             |

| Receptor                                                                          | Effects                                                                                   | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                        | Scoped in/ Scoped out |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                                                                                   | under institutional and built environment).                                               |                       |                                    |                                                | identified through the EIA process where necessary, taking account of embedded design and pollution prevention measures.                                          |                       |
| Noise and vibration (bio-physical environment)                                    | Receptors may be impacted by construction noise.                                          | High - Low            | High - Low                         | Significant                                    | Potential mitigation within the EIA Scoping Area may be required, subject to the findings of the technical assessments.                                           | Scoped in             |
| Wider societal infrastructure and resources (institutional and built environment) | Receptors may benefit from enhanced water supply resilience and increased water security. | Moderate - Low        | High                               | Significant                                    | No mitigation is proposed at this stage as the Proposed Development is intended to enhance regional water supply resilience and improve long-term water security. | Scoped in             |
| Maritime Navigation                                                               | Receptors are not expected to experience changes to access, navigation routes             | Very Low              | High - Low                         | Not Significant                                | None required.                                                                                                                                                    | Scoped out            |

| Receptor                                          | Effects                                                                                                                                                                                        | Anticipated Magnitude | Anticipated Importance/Sensitivity                  | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/ Scoped out |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------|------------------------------------------------|----------------------------|-----------------------|
|                                                   | or safety during the Proposed Development's operational phase. The presence of the proposed LSO component's infrastructure will not require exclusion zones or significantly alter marine use. |                       |                                                     |                                                |                            |                       |
| <b>Decommissioning</b>                            |                                                                                                                                                                                                |                       |                                                     |                                                |                            |                       |
| Physical activity (health related behaviours)     | Impact on population level physical activity.                                                                                                                                                  | Very Low              | High - Low depending on baseline level of activity. | Not Significant                                | None required.             | Scoped out            |
| Risk taking behaviour (health related behaviours) | Impact on population level safety behaviours.                                                                                                                                                  | Very Low              | Low                                                 | Not Significant                                | None required.             | Scoped out            |
| Diet and nutrition (health related behaviours)    | Impact on population level diet.                                                                                                                                                               | Very Low              | High - Low depending on baseline level              | Not Significant                                | None required.             | Scoped out            |



| Receptor                                               | Effects                                                                  | Anticipated Magnitude | Anticipated Importance/<br>Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/<br>Scoped out |
|--------------------------------------------------------|--------------------------------------------------------------------------|-----------------------|----------------------------------------|------------------------------------------------|----------------------------|--------------------------|
|                                                        |                                                                          |                       | of healthy eating.                     |                                                |                            |                          |
| Housing (social environment)                           | Receptors may be impacted by temporary severance.                        | High - Low            | High                                   | Not Significant                                | None required.             | Scoped out               |
| Relocation (social environment)                        | Receptors may be impacted by land needs.                                 | Very Low              | High                                   | Not Significant                                | None required.             | Scoped out               |
| Open space, leisure and play (social environment)      | Receptors may be impacted by temporary severance.                        | High - Low            | High - Low                             | Not Significant                                | None required.             | Scoped out               |
| Transport, modes, and connections (social environment) | Receptors may be impacted by temporary diversions and severance.         | High - Low            | High - Low                             | Not Significant                                | None required.             | Scoped out               |
| Community safety (social environment)                  | Receptors may be impacted by traffic changes and construction workforce. | Low - Medium          | Medium - Low                           | Not Significant                                | None required.             | Scoped out               |

| Receptor                                                                   | Effects                                                                                          | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                | Scoped in/ Scoped out |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------|-----------------------|
| Community identity, culture, resilience and influence (social environment) | Receptors may be impacted by real and perceived impact on community cohesion.                    | High - Low            | High - Low                         | Not Significant                                | None required.                            | Scoped out            |
| Social participation, interaction and support (social environment)         | Receptors may be impacted by real and perceived levels of influence on the Proposed Development. | High - Low            | High - Low                         | Not Significant                                | None required.                            | Scoped out            |
| Education and training (economic environment)                              | Receptors may be impacted by opportunities to access education and training.                     | High                  | High - Low                         | Not Significant                                | None required.                            | Scoped out            |
| Employment and income (economic environment)                               | Receptors may be impacted by opportunities to access employment.                                 | Medium - Low          | Medium                             | Not Significant                                | None required.                            | Scoped out            |
| Land quality                                                               | Receptors may be impacted by                                                                     | High - Low            | High - Low                         | Significant (but assessed under                | No human health mitigation is proposed at | Scoped out            |

| Receptor                                                                        | Effects                                                            | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                  | Scoped in/ Scoped out |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------|
| (bio-physical environment)                                                      | changes to land quality, for example, for food production.         |                       |                                    | other technical assessment).                   | this stage, as potential effects on land quality are being assessed through separate technical assessments. |                       |
| Radiation (bio-physical environment)                                            | Receptors may be impacted in changes to baseline radiation levels. | Low                   | High - Low                         | Not Significant                                | None required.                                                                                              | Scoped out            |
| Health and social care services (institutional and built environment)           | Receptors may be impacted by increased demand for services.        | Low                   | Medium                             | Not Significant                                | None required.                                                                                              | Scoped out            |
| Wider societal infrastructure and resources Institutional and Built Environment | Receptors may be impacted by increased demand on services.         | Moderate - Low        | High                               | Significant                                    | None required.                                                                                              | Scoped in             |
| Climate change mitigation and adaptation                                        | Receptors may be impacted by changes to climate such as            | High                  | High - Low                         | Significant                                    | Implementation of relevant measures identified through the technical assessments                            | Scoped in             |

| Receptor                                                 | Effects                                                                  | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                   | Scoped in/ Scoped out |
|----------------------------------------------------------|--------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| (bio-physical environment)                               | flooding or drought that interact with the Proposed Development.         |                       |                                    |                                                | and incorporated within the DEMP, prepared in accordance with the ODEMP.                                                                     |                       |
| Air quality (bio-physical environment)                   | Receptors may be impacted by air pollution and dust changes.             | High - Low            | High - Low                         | Significant                                    | Implementation of best practice measures in line with IAQM guidance and measures set out in the DEMP, prepared in accordance with the ODEMP. | Scoped in             |
| Water quality or availability (bio-physical environment) | Receptors may be impacted by changing levels of access to potable water. | High - Low            | High - Low                         | Significant                                    | Implementation measures set out in the DEMP, prepared in accordance with the ODEMP.                                                          | Scoped in             |
| Noise and vibration (bio-physical environment)           | Receptors may be impacted by construction noise.                         | High - Low            | High - Low                         | Significant                                    | Implementation measures set out in the DEMP, prepared in accordance with the ODEMP.                                                          | Scoped in             |
| Maritime Navigation                                      | Effects are not anticipated during decommissioning, as infrastructure    | Very Low              | High - Low                         | Not Significant                                | None required                                                                                                                                | Scoped out            |

| Receptor | Effects                                                                                                                                                                            | Anticipated Magnitude | Anticipated Importance/<br>Sensitivity | Likely Significance of<br>Effect at Scoping<br>Stage | Likely Mitigation<br>Measures | Scoped in/<br>Scoped out |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------|------------------------------------------------------|-------------------------------|--------------------------|
|          | is anticipated to remain in situ. Where decommissioning works are required, impacts would be temporary and similar to those experienced during construction, but smaller in scale. |                       |                                        |                                                      |                               |                          |

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## 19 Ground Conditions

### 19.1 Introduction

19.1.1 This chapter outlines the proposed scope and methodology for the assessment of the likely significant effects arising from the construction, operation and decommissioning of the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on ground conditions. The findings of the assessment will be presented within the Environmental Statement (‘ES’) submitted in support of the application for a Development Consent Order (‘DCO’). It describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.

19.1.2 The EIA Scoping Area is illustrated on Figure 1-1. This chapter should be read in conjunction with the following chapters of the Scoping Report:

- Chapter 6 Terrestrial Biodiversity.
- Chapter 7 Freshwater Biodiversity.
- Chapter 9 Water Environment.
- Chapter 11 Terrestrial Historic Environment.
- Chapter 20 Agricultural Land and Soils.
- Chapter 22 Major Accidents and Disasters.

19.1.3 The following aspects will be covered in this ground conditions chapter of the Scoping Report:

- Land contamination.
- Land stability.
- Geological designated sites.

19.1.4 Effects of the Proposed Development on ecological receptors, including those supported by groundwater and surface water, are considered within chapter 6 terrestrial biodiversity and chapter 7 freshwater biodiversity. However, this chapter will identify where potential land contamination within

the EIA Scoping Area may impact groundwater or surface water that may be supporting these ecological receptors.

- 19.1.5 Effects of the Proposed Development on surface water and groundwater receptors, in terms of the Water Framework Directive ('WFD') [1] or deterioration of the WFD status, and subsequent impacts to groundwater receptors such as abstractions, springs or groundwater dependant terrestrial ecosystems, are considered in chapter 9 water environment. However, this chapter will identify where land contamination within the EIA Scoping Area may impact groundwater or surface water.
- 19.1.6 Effects on agricultural soil resources, soil quality and minerals (including Peat) are considered within chapter 20 agricultural land and soils.
- 19.1.7 This chapter has been undertaken by a suitably qualified and experience specialist with 25 years' experience in the geotechnical and contaminated land industry in the UK. They have a degree in Industrial Geology (BEng) and a MSc in Geotechnical Engineering and significant experience of delivering contaminated land, geology and ground conditions assessments under the requirements of the EIA Regulations in support of DCO applications, including for Nationally Significant Infrastructure Projects ('NSIPs').

## 19.2 Study Area

- 19.2.1 For the purposes of establishing the baseline conditions and defining the spatial scope of the ground conditions assessment, the study area has been defined as the EIA Scoping Area plus a 250m radius and is shown on Figure 19-1. A 250m radius is generally deemed the 'industry standard' for ground conditions.
- 19.2.2 The study area has been defined on the basis of the distance over which potential sources of contamination may migrate to have an impact on identified receptors and is in line with the Environment Agency's ('EA') approach to groundwater protection [2], which identifies a 250m distance from the potential source of contamination to protect water supplies used for

human consumption or farm dairies. Given the scale and nature of the Proposed Development, this is considered a robust and proportionate approach.

- 19.2.3 The study area is also based on professional judgment, knowledge of similar projects and the National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 109 Geology and Soils (2019) [3] (the 'DMRB LA 109 Guidance'), which comprises best practice guidance. In addition, although not directly relevant to the Proposed Development given its nature, the study area accords with that recommended in The National House Building Council's Guidance for the Safe Development of Housing on Land Affected by Contamination (2008) [4].
- 19.2.4 The study area for ground conditions will be refined as the design of the Proposed Development evolves, including the route of the pipeline components and the location of the above-ground components. The location of any receptors in relation to the study area, as well as the distance in which impacts will occur will be considered during the refinement process. However, it is anticipated that the study area for the ES will be the proposed Order Limits plus the same radius as described above.
- 19.2.5 Appendix 19.1 sets out the legislation, policy and guidance relevant to ground conditions. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

### 19.3 Consultation and Engagement

- 19.3.1 A virtual meeting was held on 9 April 2026 which was attended by South Norfolk District Council ('SNDC'), Suffolk County Council ('SCC'), East Suffolk Council ('ESC'), Mid Suffolk District Council ('MSDC') and the Broads Authority ('BA') to discuss the proposed approach to the assessment methodology for the ground conditions chapter of the ES. Feedback discussed during the meeting on this proposed approach has been outlined as follows:



- The BA commented that the effects of the Proposed Development should be included in the proposed scope of the assessment at the EIA Scoping stage, with possible impacts comprising transmissivity, groundwater, seepage and carbon emissions, and also highlighted that Peat should be adequately considered. It was discussed that the majority of the assessment of effects on Peat would be considered in chapter 20 agricultural land and soils, but that the ground conditions chapter should have a clear cross-reference to that chapter.
- SNDC advised that the EA's Land Contamination Risk Management (2025) [5] guidance (the 'LCRM Guidance') had been followed when setting out the proposed approach to the assessment methodology.
- ESC noted that data for private water supplies would have to be requested and highlighted General Data Protection Regulations ('GDPR') limitations. It was confirmed that this data would be requested on behalf of the Applicant in due course and incorporated into the ground conditions ES chapter, where relevant.

## 19.4 Baseline Environment

- 19.4.1 The baseline conditions have been established, including accounting for any known history or conditions related to land contamination, land stability and geologically designated sites within the study area. The baseline information is sourced from a preliminary review of publicly available data.
- 19.4.2 The baseline information presented in this chapter has been informed by a desk-based study which has drawn on the following information sources:
- British Geological Survey ('BGS') 1:50,000 scale geological mapping [6].
  - BGS Geoindex Viewer [7].
  - BGS Hydrogeological Maps of the UK [8].
  - Department for the Environment, Food and Rural Affairs ('Defra') mapped information, via the Multi-Agency Geographic Information for the Countryside ('MAGIC') website [9] for groundwater source protection zones ('SPZs'), aquifer designations, hydrological features, groundwater vulnerability, drinking water safeguard zones and statutory designated sites.
  - The EA datasets for the locations for historical landfills and permitted landfill and waste sites, and category 1 and 2 pollution incidents [10].
  - EA Catchment Data Explorer [11].
  - EA New Groundwater Vulnerability Mapping Methodology in England and Wales [12].
  - Natural England ('NE'), Designated Sites View [13].

- Georeferenced historical Ordnance Survey maps for the United Kingdom [14].
- Google Earth and Britain from Above [15] and Historic England [16] historical aerial imagery.
- UK Health Security Agency ('UKHSA') UK radon mapping [17].
- Local Geological Sites information from Geo Suffolk [18].

19.4.3 The above data sources are used to identify potential sources of contamination and sensitive receptors, along with the pathways that link them. This develops the Conceptual Site Model ('CSM') for the study area. The chapters of this Scoping Report referenced in paragraph 19.1.2 have also informed the CSM.

19.4.4 The baseline information for ground conditions has been separated out by geographical areas referred to as 'sections of the EIA Scoping Area' (refer to Figure 1-3) based on the following components of the Proposed Development (the study area for each section is as described in section 19.2):

- Proposed Advanced Water Recycling Plant ('AWRP').
- Proposed Long Sea Outfall ('LSO').
- Proposed Central Service Reservoir ('CSR').
- Proposed Western Service Reservoir ('WSR').
- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
- Proposed CSR to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

19.4.5 The baseline information is presented in the following sub-sections, for the reasons stated:

- Site history – to identify potential contaminative uses and significant reprofiling.

- Geology and Hydrogeology – to identify strata, which could act as sources (naturally elevated chemicals), pathways for (or inhibitors to) contaminant migration, or receptors (sensitive aquifers, abstraction users). Also, to identify potential land stability issues based on natural cavities and foundation conditions (soil properties such as compressibility, shrinkage/swelling clays).
- Hydrology – to identify potential receptors (surface water features, abstraction users).
- Mining and mineral extraction – to identify potential sources of contamination or ground gas from infilled quarries or pits and potential ground stability issues (artificial cavities).
- Waste management – to identify potential sources of contamination and ground gas from landfill facilities or other waste sites.
- Radon – to identify potential source of radon requiring mitigation.
- Unexploded Ordnance ('UXO') – to identify potential sources of contamination in relation to bomb damage (explosives) and infilled ground from bomb strikes (site levelling/re-profiling).

#### *Geology – Made Ground*

19.4.6 Although specific superficial and bedrock geology is detailed for each EIA Scoping Area section (and the corresponding part of the study area) below, localised Made Ground is likely to be present in current and historical areas of development. No ground investigations have been undertaken at the time of writing but will be undertaken to inform the evolution of the design of the Proposed Development. Any information from future ground investigation works will be used to inform the assessment in the ground conditions chapter of the ES, where available.

19.4.7 The various geology types that are expected to be encountered across the study area are summarised in Table 19-1.

Table 19-1: Geology Type Summary

| Geology Type                | Composition                  |
|-----------------------------|------------------------------|
| <b>Superficial Deposits</b> |                              |
| Head Deposits               | Clay, silt, sand and gravel. |
| Alluvium                    | Clay, silt, sand and gravel. |
| River Terrace Deposits      | Sand and gravel.             |
| Tidal Flat Deposits         | Clay and silt.               |

| Geology Type                     | Composition                                                                                            |
|----------------------------------|--------------------------------------------------------------------------------------------------------|
| Lowestoft Formation              | Clay and silt, Diamicton or Sand and gravel.                                                           |
| Happisburgh Glacigenic Formation | Diamicton or Sand and gravel.                                                                          |
| Haddiscoe Member                 | Sand and gravel.                                                                                       |
| Corton Woods Member              | Sand and gravel.                                                                                       |
| Breydon Formation                | Clay and silt or Peat.                                                                                 |
| Peat                             | Decomposed mass of semi-carbonised vegetation which has grown under waterlogged, anaerobic conditions. |
| Blown Sand                       | Sand.                                                                                                  |
| <b>Bedrock</b>                   |                                                                                                        |
| Crag Group                       | Sands, gravels, silts and clays.                                                                       |

### *Geological Designated Sites*

- 19.4.8 Based on desk-based information gathered from NE, SCC and Norfolk County Council ('NCC') and from review of MAGIC [19], there is one geologically designated site within the study area, as shown on Figure 19-3.
- 19.4.9 The site, Leet Hill, Kirby Cane Site of Special Scientific Interest ('SSSI'), is located within the study area of the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area, approximately 150m northwest of the western portion of this section. The SSSI is approximately 6.5ha in area and the grid reference for the site is TM 380 929. It was first notified in 1994 under SNDC. The site is considered of important geological interest as it provides important sections through a sequence of Middle Pleistocene deposits. The sedimentary structures are considered to be in good condition and have the potential to be used for future geological research.

### *Private Water Supplies*

- 19.4.10 Information sources relating to private water supplies ('PWS') have not been obtained for the preparation of this chapter of the Scoping Report. These would be requested later in the EIA process to support the

assessment in the water environment chapter of the ES and will also inform the ground conditions chapter of the ES.

### Proposed AWRP

#### *Site History*

- 19.4.11 Historical mapping indicates that the predominant land use for the proposed AWRP section of the EIA Scoping Area and its study area has been agricultural fields. The wider surrounding area has also been used as farmland. Since the late 1800s to early 1900s, farm buildings have been located just off various roads within the proposed AWRP section of the EIA Scoping Area and its study area, such as the A47, Jay Lane and Hall Road. Additionally, a large fishing pond is located 55m southeast of Dorking Road and an orchard with associated buildings, now a garden centre, has been present since the mid-1900s, immediately north of Jay Lane, within the proposed AWRP 250m study area.

#### *Geology and Hydrogeology*

- 19.4.12 Based on limited historical borehole records in the surrounding area (within and beyond the proposed AWRP section of the EIA Scoping Area and its study area [20]), the geology is expected to consist of predominantly Happisburgh Glacigenic Formation, with intermittent Lowestoft Formation and Corton Woods Sand and Gravel Member down to approximately 20m below ground level ('bgl'), overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment of baseline conditions in the ground conditions chapter of the ES, where available.
- 19.4.13 The superficial deposits are classified as Secondary A aquifers, and the Crag Group is classified as a Principal Aquifer. The proposed AWRP section of the EIA Scoping Area and its study area is not within a SPZ and there are no licensed active groundwater abstractions.

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### *Hydrology*

- 19.4.14 A fishing pond, located 55m southeast of Dorking Road within the proposed AWRP 250m study area, is fed by a watercourse named 'Hopton Run', which extends further northwest. There are no licenced active surface water abstractions within the proposed AWRP section of the EIA Scoping Area and its study area.

### *Mining and Mineral Extraction*

- 19.4.15 The proposed AWRP section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites.
- 19.4.16 There are no other active or historical mineral extraction sites (i.e. quarries) within the proposed AWRP section of the EIA Scoping Area and its study area.

### *Waste Management*

- 19.4.17 There is one historical waste management site recorded within the proposed AWRP 250m study area, which is shown in Figure 19-2. The waste site is approximately 125m east of the A47 and is named 'Oak View Farm'. It was operated by NCC. However, the accepted waste type is unknown. The license for this waste site was issued on 9 March 1982. The last input date is unknown; however, the site is no longer used as a waste site and due to the current land use (rough scrubland on the boundary of farmland and residential properties), it is unlikely to become re-active as a waste site.

### *Radon*

- 19.4.18 UKHSA UK radon mapping indicates that the proposed AWRP section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

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*Unexploded Ordnance ('UXO')*

- 19.4.19 A preliminary review of UXO risk maps has been undertaken for the proposed AWRP section of the EIA Scoping Area and its study area, and it is located within a low risk of UXO area.

**Proposed LSO**

*Site History*

- 19.4.20 Historical mapping indicates that the predominant land use of the western (terrestrial) portion of the proposed LSO section of the EIA Scoping Area and its study area has been agricultural fields. The wider surrounding area has also been used as farmland. Two farms were located along the north of the study area, comprising Valley Farm and Warren Farm, of which, the former remains today, and the latter has been developed into a golf course named Gorleston Golf Club. The southern (terrestrial) portion of the proposed LSO 250m study area has remained mostly undeveloped and still features agricultural fields.
- 19.4.21 The central area of the western (terrestrial) portion contains the main Hopton Settlement which has gradually developed and expanded since the late 1800s. Previously, the Norfolk and Suffolk Joint Railway and associated station passed through Hopton, orientated north-south. However, this was re-developed for housing in the 1970s and no evidence of the railway remains.
- 19.4.22 The eastern (terrestrial and marine) portion of the proposed LSO section of the EIA Scoping Area and its study area consists of coastline and beaches, extending out into the North Sea. In recent years, sea defences such as groynes have been constructed along the coastline.

*Geology and Hydrogeology*

- 19.4.23 Based on limited historical borehole records in the surrounding area (within and beyond the proposed LSO section of the EIA Scoping Area and its study area), the onshore geology is expected to consist of predominantly Happisburgh Glacigenic Formation, Lowestoft Formation, Blown Sand and

Corton Woods Sand and Gravel Member deposits down to approximately 20m bgl, overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment of baseline conditions in the ground conditions chapter of the ES, where available.

- 19.4.24 The offshore geology of the proposed LSO section of the EIA Scoping Area and its study area consists of shallow seabed deposits, overlying older marine deposits which are underlain by the Crag Group.
- 19.4.25 The superficial deposits are classified as Secondary A aquifers, and the Crag Group is classified as a Principal Aquifer. The proposed LSO section of the EIA Scoping Area and its study area is not within a SPZ and there is one licenced active groundwater abstraction.

#### *Hydrology*

- 19.4.26 There are multiple surface water features within the western (terrestrial) portion of the proposed LSO 250m study area. A fishing pond is located approximately 170m west, with another pond at Valley Farm, which is located approximately 25m north. Within the central area, there is a collection of surface water features, including a collection of ponds within a holiday home complex 250 north east of Potters Drive, and a narrow ditch within a golf course located approximately 150m northeast of Warren Road.
- 19.4.27 The eastern portion of the proposed LSO section of the EIA Scoping Area and its study area extends over the coastline to the east and into the North Sea.
- 19.4.28 There are no licenced active surface water abstractions within the proposed LSO section of the EIA Scoping Area and its study area.

#### *Mining and Mineral Extraction*

- 19.4.29 The proposed LSO section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites, however, mapping indicates that historical pits are present.



19.4.30 A historical pit labelled ‘Vicarage Sand Pit’ is located on Warren Road.  
Another pit labelled as ‘Red Barn Pit’ is located approximately 210m south, next to Fourways Farm.

### *Waste Management*

19.4.31 There are four historical waste sites within the proposed LSO section of the EIA Scoping Area and its study area, as detailed in Table and shown in Figure 19-2.

Table 19-2: Landfills within Long Sea Outfall Section of the Study Area

| Landfill Name                             | Approximate Distance (m) from EIA Scoping Area Section | Comments                                                                                                                                                                |
|-------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oak View Farm                             | 20m north                                              | Site address: Lowestoft Road, Hopton, Great Yarmouth.<br>Operator: Norfolk County Council<br>License Issued: 9 March 1982<br>Last input: unknown<br>Waste type: unknown |
| Disused Railway Cutting off Stirrups Lane | 20m east                                               | Site address: Corton<br>Operator: Corton Caravan and Chalets Limited<br>License Issued: 19 January 1981<br>Last input: 30 December 1983<br>Waste type: unknown          |
| Station Road                              | 180m east                                              | Site address: Corton<br>Operator: unknown<br>License Issued: unknown<br>Last input: unknown<br>Waste type: unknown                                                      |
| North Denes                               | Within the boundary of this section’s study area       | Site address: Blackborough End, Lowestoft, Suffolk<br>Operator: unknown<br>License Issued: unknown<br>Last input: 1 November 1954<br>Waste type: 30 April 1971          |

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*Radon*

- 19.4.32 UKHSA UK radon mapping indicates that the proposed LSO section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

*UXO*

- 19.4.33 A Detailed UXO Risk Assessment has been undertaken on the proposed LSO section of the EIA Scoping Area and its study area which concluded that the area is within a medium to high risk zone. The report considered factors such as site history, evidence of Unexploded Bomb ('UXB') presence, military activity and the scope of the proposed works, to generate the risk assessment.
- 19.4.34 The medium risk zones are split into previously undeveloped land (including greenfield) and built-up areas, with the undeveloped areas being at a slightly higher risk due to the presence of open ground which has the ability to mask undetected shallow and deep UXO presence. The high risk zone refers to the eastern (marine) portion of the proposed LSO section of the EIA Scoping Area and its study area, starting from the coastline and extending into the North Sea.
- 19.4.35 In addition to the historical evidence in the area, a high risk was identified due to the offshore and intertidal zones and the associated potential for UXO/UXB presence to be concealed. Additionally, UXO/UXB items on the seabed could have been influenced by tidal migration.

**Proposed CSR**

*Site History*

- 19.4.36 Historical mapping indicates that the predominant land use for the proposed CSR section of the EIA Scoping Area and its study area has been agricultural fields. The wider surrounding area has also been used as farmland. Various farms have been present on mapping since the late 1800s and are located along the lane in the south of the proposed CSR section's 250m study area, with many of these farms still present today.

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*Geology and Hydrogeology*

- 19.4.37 Based on limited historical borehole records in the surrounding area (within and beyond the proposed CSR section of the EIA Scoping Area and its study area), the geology is expected to consist of Lowestoft Formation deposits down to between 20m and 35m bgl, overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment of baseline conditions in the ground conditions chapter of the ES, where available.
- 19.4.38 The superficial deposits are classified as a Secondary Undifferentiated aquifer, and the Crag Group is classified as a Principal Aquifer. The proposed CSR section of the EIA Scoping Area and its study area is within a SPZ 3 (Total Catchment) and there are no licenced active groundwater abstractions.

*Hydrology*

- 19.4.39 A surface water feature, possibly a field drain, is located approximately 160m north of the unnamed road in the south of the proposed CSR section's 250m study area, potentially connecting to a watercourse that extends further south through West Cottage, located off the same road. Another group of ponds are located approximately 530m southwest of Poplar Farm.
- 19.4.40 There are no licenced active surface water abstractions within the proposed CSR section of the EIA Scoping Area and its study area.

*Mining and Mineral Extraction*

- 19.4.41 The proposed CSR section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites.
- 19.4.42 There are no active or historical mineral extraction sites (i.e. quarries) within the proposed CSR section of the EIA Scoping Area and its study area.

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*Waste Management*

- 19.4.43 There are no current or historical waste management sites recorded within the proposed CSR section of the EIA Scoping Area and its study area.

*Radon*

- 19.4.44 UKHSA UK radon mapping indicates that the proposed CSR section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

*UXO*

- 19.4.45 A preliminary review of UXO risk maps has been undertaken on the proposed CSR section of the EIA Scoping Area and its study area and concluded that it is within a low risk of UXO area.

**Proposed WSR**

*Site History*

- 19.4.46 Historical mapping indicates that the predominant land use for the proposed WSR section of the EIA Scoping Area and its study area has been agricultural fields. The wider area has also been used as farmland and has mostly remained undeveloped until recent years, with settlements such as Thrandeston and Brome, to the west and southeast respectively, expanding since the mid-1900s.
- 19.4.47 RAF Eye, within the proposed WSR section's 250m study area, was developed approximately 400m south of Brome village in the 1940s and was used as an airbase, which has since been converted into an industrial estate.

*Geology and Hydrogeology*

- 19.4.48 Based on limited historical borehole records in the surrounding area (within and beyond the proposed WSR section's 250m study area), the geology is expected to consist of predominantly Lowestoft Formation deposits, with Head and Alluvium deposits along the watercourse towards the western portion of the section. Depths of these deposits are expected to be 25m bgl, overlying the Crag Group. Any information from future ground investigation

works will be used to inform the baseline conditions assessment in the ground conditions chapter of the ES, where available.

- 19.4.49 The superficial deposits are classified as Secondary Undifferentiated aquifers, and the Crag Group is classified as a Principal Aquifer. The proposed WSR section of the EIA Scoping Area and its study area is partially within a SPZ 3 (Total Catchment) and there are no licenced active groundwater abstractions.

#### *Hydrology*

- 19.4.50 An unnamed surface watercourse runs through the wider area and beyond the proposed WSR section's 250m study area, located approximately 650m northwest of the A140. Small groups of surface water features are located 420m and 380m northwest of the A140, respectively, at Malting Farm and an unnamed collection of buildings further south.
- 19.4.51 There are no licenced active surface water abstractions within the proposed WSR section of the EIA Scoping Area and its study area.

#### *Mining and Mineral Extraction*

- 19.4.52 The proposed WSR section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites.
- 19.4.53 There are no active or historical mineral extraction sites (i.e. quarries) within the proposed WSR section of the EIA Scoping Area and its study area.

#### *Waste Management*

- 19.4.54 There is one historical waste management site within the proposed WSR section's 250m study area, recorded at RAF Eye, as shown in Figure 19-2. The waste site is also located approximately 35m west of the B1077 and is entitled 'Land East of Brome Industrial Estate'. There is no other information available, such as the waste type accepted or dates active.

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*Radon*

- 19.4.55 UKHSA UK radon mapping indicates that the proposed WSR section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

*UXO*

- 19.4.56 A preliminary review of UXO risk maps has been undertaken on the proposed WSR section of the EIA Scoping Area and its study area and concluded that it is within a low risk of UXO area.

**Proposed AWRP to River Waveney Pipeline**

*Site History*

- 19.4.57 Historical mapping indicates that the main land uses over time at the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area has been agricultural and has been kept as farming fields. The wider surrounding area has also been used as farmland. Many farm buildings are still present that have been recorded on mapping since the late 1800s with settlements such as Hopton and Blundeston in the east, and Gillingham and Geldeston in the west, expanding since the mid-1900s.

*Geology and Hydrogeology*

- 19.4.58 Based on limited historical borehole records in the surrounding area (within and beyond the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area), the geology is expected to consist of predominantly Lowestoft Formation, Happisburgh Glacigenic Formation, Haddiscoe Sand and Gravel Member and Breydon Formation. Depths of these deposits are expected to be between 18m and 26m bgl, overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment in the ground conditions chapter of the ES, where available.
- 19.4.59 The superficial deposits are classified as Secondary A or Secondary Undifferentiated aquifers, and the Crag Group is classified as a Principal Aquifer. The western portion of the proposed AWRP to River Waveney Pipeline section's 250m study area is partially within a SPZ 3 (Total

Catchment). There is one licenced active and four historical groundwater abstractions within the proposed AWRP section's 250m study area.

### *Hydrology*

19.4.60 There are multiple watercourses and water bodies of varying sizes located within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area. The most notable includes the River Waveney and The Broads, within which this section of the EIA Scoping Area intersects the river to the east, southwest of Blundeston, and extends over the width of The Broads. The western extent of the proposed AWRP to River Waveney Pipeline section's 250m study area also extends into The Broads and to a different section of the River Waveney, just south of Ellingham.

19.4.61 There are no licenced active surface water abstractions within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area.

### *Mining and Mineral Extraction*

19.4.62 The proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites, however, mapping suggests that there are large quantities of historical pits, comprising farm, gravel and sand pits.

19.4.63 An active quarry, named Kirby Cane Quarry/Recycling Centre, shown in Figure 21-1 of chapter 21 minerals and waste, is located 130m northwest from the western portion of the proposed AWRP to River Waveney Pipeline section 250m study area.

### *Waste Management*

19.4.64 There are multiple historical waste management sites recorded within the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area, these are detailed in Table 19-3 and are shown in Figure 19-2.

Table 19-3: Landfills within the Proposed AWRP to River Waveney Pipeline Study Area

| Landfill Name                             | Approximate Distance (m) from EIA Scoping Area Section | Comments                                                                                                                                                    |
|-------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oak View Farm                             | 160m west                                              | Address: Lowestoft Road, Hopton, Great Yarmouth.<br>Operator: NCC<br>License Issued: 9 March 1982<br>Last input: -<br>Waste type: -                         |
| Disused Railway Cutting off Stirrups Lane | 250m west                                              | Address: Corton<br>Operator: Corton Caravan and Chalets Limited<br>License issued: 19 January 1981<br>Last input: 30 December 1983<br>Waste type: -         |
| Land East of Wheatacre Hill               | 250m south                                             | Address: Wheatacre, South Norfolk.<br>Operator: RDC<br>License issued: -<br>Last input: -<br>Waste type: -                                                  |
| Hollow Way Road                           | Within the boundary of this sections study area        | Address: Yarmouth Road, Gillingham, Beccles.<br>Operator: R T T Bramley<br>License issued: 1 January 1974<br>Last input: 31 December 1991<br>Waste type: -  |
| Hill House Farm                           | Within the boundary of this sections study area        | Address: Yarmouth Road, Gillingham, Norfolk.<br>Operator: UK Waste Management Limited<br>License issued: 18 November 1992<br>Last input: -<br>Waste type: - |

### Radon

19.4.65 UKHSA UK radon mapping indicates that the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area is not in a Radon Affected Area.



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## UXO

- 19.4.66 A preliminary review of UXO risk maps has been undertaken on the proposed AWRP to River Waveney Pipeline section of the EIA Scoping Area and its study area and concluded that it is within a low risk of UXO area.

## Proposed Barsham WTW to CSR Pipeline

### *Site History*

- 19.4.67 Historical mapping indicates that the main land use over time within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area has been agricultural and has been kept as farming fields. The wider surrounding area has also been used as farmland. Many farm buildings are still present that have been recorded on mapping since the late 1800s with settlements such as Halesworth and Walpole in the south, expanding since the early-1900s.

### *Geology and Hydrogeology*

- 19.4.68 Based on limited historical borehole records in the surrounding area (within and beyond the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area), the geology is expected to consist of Lowestoft Formation, Alluvium, Head and River Terrace Deposits. Depths of these deposits are expected to be between 18m and 26m bgl, overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment in the ground conditions chapter of the ES, where available.
- 19.4.69 The superficial deposits are classified as Secondary A or Secondary Undifferentiated aquifers, and the Crag Group is classified as a Principal Aquifer. The northern portion of the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area is within both SPZ 1 (Inner Protection Zone) and SPZ 2 (Outer Protection). The remainder of this section of the EIA Scoping Area and its study area is within SPZ 3 (Total Catchment). There are no licenced active groundwater abstractions,

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however, there are two historical groundwater abstractions within this section of the EIA Scoping Area and its study area.

### *Hydrology*

- 19.4.70 There are multiple watercourses and water bodies of varying sizes located within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area. This section of the EIA Scoping Area intersects The Beck and The River Blythe, to the west and southwest of Halesworth, respectively.
- 19.4.71 There are no licenced active surface water abstractions within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area.

### *Mining and Mineral Extraction*

- 19.4.72 The proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites, however, mapping suggests that there are multiple historical pits, comprising farm, gravel and sand pits.
- 19.4.73 There are no other active or historical mineral extraction sites (i.e. quarries) within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area.

### *Waste Management*

- 19.4.74 There is one historical waste management site recorded within the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area, as shown in Figure 19-2. The waste site is located within the boundary of the section, immediately west of Church Road and is entitled 'Site at Ringsfield'. There is no other information available, such as the waste type accepted.

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*Radon*

- 19.4.75 UKHSA UK radon mapping indicates that the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

*UXO*

- 19.4.76 A preliminary review of UXO risk maps has been undertaken on the proposed Barsham WTW to CSR Pipeline section of the EIA Scoping Area and its study area and concluded that it is within a low risk of UXO area.

**Proposed CSR to WSR Pipeline**

*Site History*

- 19.4.77 Historical mapping indicates that the main land use over time at the proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area has been agricultural and has been kept as farming fields. The wider surrounding area has also been used as farmland.
- 19.4.78 During the early 1900s, a railway line was constructed just east of Horham intersecting this section of the EIA Scoping Area and its study area, orientated roughly northeast - southwest with associated infrastructure and station. However, this was removed by the late 1900s, and all trace of the line have been removed. During the Second World War, an airfield was located immediately north of Horham. Many farm buildings within the proposed CSR to WSR Pipeline section's 250m study area are still present that have been recorded on mapping since the late 1800s.

*Geology and Hydrogeology*

- 19.4.79 Based on limited historical borehole records in the surrounding area (within and beyond the proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area), the geology is expected to consist of predominantly Lowestoft Formation, Alluvium and Head deposits. Depths of these deposits are expected to be between 25m to 40m bgl, overlying the Crag Group. Any information from future ground investigation works will be

used to inform the assessment in the ground conditions ES chapter, where available.

- 19.4.80 The superficial deposits are classified as Secondary A or Secondary Undifferentiated aquifers, and the Crag Group is classified as a Principal Aquifer. The majority of the proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area is within a SPZ 3 (Total Catchment) and there are no licenced active groundwater abstractions.

#### *Hydrology*

- 19.4.81 There are multiple watercourses and water bodies of varying sizes located within the proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area. This section intersects the River Dove in multiple locations, between Eye and Stradbroke. Smaller tributaries and watercourses associated with the River Yox and River Blythe are also within the proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area.
- 19.4.82 There are no licenced active surface water abstractions within the proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area.

#### *Mining and Mineral Extraction*

- 19.4.83 The proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites, however, mapping suggests that there are several historical pits comprising farm, gravel, brick and sand pits.
- 19.4.84 There are no other active or historical mineral extraction sites (i.e. quarries) within this section of the EIA Scoping Area and its study area.

#### *Waste Management*

- 19.4.85 There are two historical waste management sites located within the proposed CSR to WSR Pipeline section's 250m study area. The waste sites are listed in Table 19-4 and are shown in Figure 19-2.

Table 19-4: Landfills within the Proposed CSR to WSR Pipeline Study Area

| Landfill Name                        | Distance from EIA Scoping Area | Comments                                                                                                                                                    |
|--------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Land East of Brome Industrial Estate | 200m southwest                 | Site address: Brome, Mid Suffolk<br>Operator: -<br>License Issued: -<br>Last input: -<br>Waste type: -                                                      |
| Drift Cottage                        | 215m southwest                 | Site address: Brome Avenue, Eye, Suffolk<br>Operator: Mr B A Monksfield<br>License Issued: 16 February 1990<br>Last input: 31 October 1990<br>Waste type: - |

### *Radon*

- 19.4.86 UKHSA UK radon mapping indicates that the majority of the proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area is not in a Radon Affected Area. However, the western portion of this section, around Eye and along the B1117, intersects areas where the maximum radon potential is 1-3%.

### *UXO*

- 19.4.87 A preliminary review of UXO risk maps has been undertaken on the proposed CSR to WSR Pipeline section of the EIA Scoping Area and its study area and concluded that it is within a low risk of UXO area.

## **Proposed CSR to Saxmundham Pipeline**

### *Site History*

- 19.4.88 Historical mapping indicates that the main land use over time at the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area has been agricultural and has been kept as farming fields. The wider surrounding area has also been used as farmland and many farm buildings are still present that have been recorded on mapping since the late 1800s.

- 19.4.89 Saxmundham, towards the southern portion of the proposed CSR to Saxmundham Pipeline section's 250m study area has developed and increased in size since the early 1900s. The A12, which is orientated north-south and is located along the west of Saxmundham, was built around the 2000s and intersects this section of the EIA Scoping Area and its study area to the south of Saxmundham.

#### *Geology and Hydrogeology*

- 19.4.90 Based on limited historical borehole records in the surrounding area (within and beyond the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area), the geology is expected to consist of predominantly Lowestoft Formation, Alluvium and Head deposits. Depths of these deposits are expected to be between 20m and 30m bgl, overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment in the ground conditions chapter of the ES, where available.
- 19.4.91 The superficial deposits are classified as Secondary A or Secondary Undifferentiated aquifers, and the Crag Group is classified as a Principal Aquifer. The majority of the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area is within a SPZ 3 (Total Catchment) and there are no licenced active groundwater abstractions.

#### *Hydrology*

- 19.4.92 There are multiple watercourses and water bodies of varying sizes located within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area. This section of the EIA Scoping Area intersects the River Yox in the north, which runs parallel to, and approximately 150m north, of the A1120. Smaller tributaries and watercourses associated with the River Yox and the River Fromus are also within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area.

- 19.4.93 There are no licenced active surface water abstractions within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area.

#### *Mining and Mineral Extraction*

- 19.4.94 The proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites, however, mapping suggests that there are multiple historical pits, mostly concentrated within the 250m study area boundary to the west of Saxmundham. These pits comprise farm, gravel and sand pits.
- 19.4.95 There are no other active or historical mineral extraction sites (i.e. quarries) within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area.

#### *Waste Management*

- 19.4.96 There is one historical waste management site recorded within the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area which is shown in Figure 19-2. The waste site is located 35m northeast of Rendham Road and is entitled 'Grove Farm'. There is no other information available, such as the waste type accepted or dates active.

#### *Radon*

- 19.4.97 UKHSA UK radon mapping indicates that the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

#### *UXO*

- 19.4.98 A preliminary review of UXO risk maps has been undertaken on the proposed CSR to Saxmundham Pipeline section of the EIA Scoping Area and its study area and concluded that it is within a low risk of UXO area.

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## Proposed Saxmundham to SZC Pipeline

### *Site History*

- 19.4.99 Historical mapping indicates that the main land use over time at the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area has been agricultural and has been kept as farming fields. The wider surrounding area has also been used as farmland.
- 19.4.100 During the 1930s, Theberton Airfield was constructed and used during the Second World War and included infrastructure such as hangars and barracks. It was located approximately 450m west of the B1122 and in the south of the proposed Saxmundham to SZC Pipeline section 250m study area. However, the airfield was closed and returned to agricultural use by the 1950s.
- 19.4.101 The East Suffolk Railway Line is present on maps as early as 1885, with the track still present today and located to the east of Kelsale and Saxmundham and orientated north-south. The proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area intersects the line approximately 400m east of Kelsale. The A12, which is orientated north-south and is located along the west of Kelsale, was built around the 2000s and intersects this section of the EIA Scoping Area and its study area at Dorleys Corner.
- 19.4.102 Towards the eastern portion of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area, beyond the 250m study area, Sizewell remained mainly undeveloped until the 1950s. Three nuclear power stations are located at Sizewell, comprising the former Sizewell A Nuclear Power Station which is undergoing decommissioning, Sizewell B Nuclear Power Station which is operational and SZC which is under construction.

### *Geology and Hydrogeology*

- 19.4.103 Based on limited historical borehole records in the surrounding area (within and beyond the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area), the geology is expected to consist of



predominantly, Lowestoft Formation, Peat, Tidal flat and Head deposits. Depths of these deposits are expected to be between 5m and 10m bgl, overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment in the ground conditions chapter of the ES, where available.

19.4.104 The superficial deposits are classified as Secondary A or Secondary Undifferentiated aquifers, and the Crag Group is classified as a Principal Aquifer. The western portion of the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area is partially within a SPZ 3 (Total Catchment) and there are no licenced active groundwater abstractions.

#### *Hydrology*

19.4.105 There are multiple watercourses and water bodies of varying sizes located within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area. The majority of the surface water features are concentrated towards the eastern portion of this section, west of Sizewell, in the form of ditches, part of which is known as Leiston Ditch. Smaller tributaries and watercourses associated with the Minsmere Old River and the River Hundred are also within this section of the EIA Scoping Area and its study area.

19.4.106 There are no surface water abstractions within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area.

#### *Mining and Mineral Extraction*

19.4.107 The proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites, however, mapping suggests that there are multiple historical pits, mostly concentrated around Kelsale and in the eastern portion of this section of the EIA Scoping Area. These pits comprise farm, gravel and sand pits.

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19.4.108 There are no other active or historical mineral extraction sites (i.e. quarries) within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area.

#### *Waste Management*

19.4.109 There are no current or historical waste management sites recorded within the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area.

#### *Radon*

19.4.110 UKHSA UK radon mapping indicates that the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

#### *UXO*

19.4.111 A preliminary review of UXO risk maps has been undertaken on the proposed Saxmundham to SZC Pipeline section of the EIA Scoping Area and its study area and concluded that the western portion of this section of the EIA Scoping Area is within a low risk of UXO area. However, the eastern portion of this section of the EIA Scoping Area, including Leiston and Sizewell, is within a moderate risk of UXO area.

### **Proposed Eastern Distribution Mains**

#### *Site History*

19.4.112 Historical mapping indicates that the predominant land uses for the proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area has been agricultural fields. The wider area has also been used as farmland and has mostly remained undeveloped until recent years, with settlements such as Brome, Mellis and Yaxley to the north, southwest and southeast, respectively, expanding since the mid-1900s.

19.4.113 RAF Eye was developed adjacent to the east of the proposed Eastern Distribution Mains 250m study area in the 1940s and was used as an airbase, which has since been converted into an industrial estate.

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19.4.114 The A140, which is a Roman road, runs parallel to and intersects the eastern boundary of this section of the EIA Scoping Area and its study area.

#### *Geology and Hydrogeology*

19.4.115 Based on limited historical borehole records in the surrounding area (within and beyond the proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area), the geology is expected to consist of predominantly Lowestoft Formation deposits, with Head and Alluvium deposits along the watercourse towards the western portion of the Eastern Distribution Mains study area. Depths of these deposits are expected to be 25m bgl, overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment in the ground conditions chapter of the ES, where available.

19.4.116 The superficial deposits are classified as Secondary Undifferentiated aquifers, and the Crag Group is classified as a Principal Aquifer. The proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area is predominantly within a SPZ 3 (Total Catchment) and there are no licenced active groundwater abstractions.

#### *Hydrology*

19.4.117 An unnamed surface watercourse runs through the proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area and there are numerous small groups of surface water features located within this section.

19.4.118 There are no licenced active surface water abstractions within the proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area.

#### *Mining and Mineral Extraction*

19.4.119 The proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites.

19.4.120 There are no other active or historical mineral extraction sites (i.e. quarries) within the proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area.

#### *Waste Management*

19.4.121 There is one historical waste management site located within the proposed Eastern Distribution Mains section 250m study area which is shown in Figure 19-2. The waste site is located just west of the B1077 and is entitled 'Land East of Brome Industrial Estate'. There is no other information available, such as the waste type accepted or dates active.

#### *Radon*

19.4.122 UKHSA UK radon mapping indicates that the proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

#### *UXO*

19.4.123 A preliminary review of UXO risk maps has been undertaken on the proposed Eastern Distribution Mains section of the EIA Scoping Area and its study area and concluded that it is within a low risk of UXO area.

### **Proposed Western Distribution Mains**

#### *Site History*

19.4.124 Historical mapping indicates that the predominant land uses for the proposed Western Distribution Mains section of the EIA Scoping Area and its study area has been agricultural fields. The wider area has also been used as farmland and has mostly remained undeveloped until recent years, with settlements such as Finningham in the centre of the study area, Gislingham, Westhorpe and Cotton to the north, west and south, respectively, expanding since the mid-1900s.

19.4.125 The Great Eastern Main Line is in the southeast of the proposed Western Distribution Mains section's 250m study area, oriented northeast-southwest which has been present since the 1840s but is now disused.

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*Geology and Hydrogeology*

19.4.126 Based on limited historical borehole records in the surrounding area (within and beyond the proposed Western Distribution Mains section of the EIA Scoping Area and its study area), the geology is expected to consist of predominantly Lowestoft Formation. Depths of these deposits are expected to be 25m bgl, overlying the Crag Group. Any information from future ground investigation works will be used to inform the assessment in the ground conditions ES chapter, where available.

19.4.127 The superficial deposits are classified as a Secondary Undifferentiated aquifer, and the Crag Group is classified as a Principal Aquifer. The proposed Western Distribution Mains section of the EIA Scoping Area and its study area is within a SPZ 3 (Total Catchment) and there are no licenced active groundwater abstractions.

*Hydrology*

19.4.128 The River Dove runs through the north of the proposed Western Distribution Mains section of the EIA Scoping Area and its study area. Various tributaries are located to the west and east of the EIA Scoping Area and its study area.

19.4.129 There are no licenced active surface water abstractions within the proposed Western Distribution Mains section of the EIA Scoping Area and its study area.

*Mining and Mineral Extraction*

19.4.130 The proposed Western Distribution Mains section of the EIA Scoping Area and its study area is not within a Coal Mining Reporting Area and does not intersect with any allocated mineral or candidate mineral sites.

19.4.131 There are no other active or historical mineral extraction sites (i.e. quarries) within the proposed Western Distribution Mains section of the EIA Scoping Area and its study area.

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*Waste Management*

19.4.132 There is one historical waste management site located within the proposed Western Distribution Mains section's 250m study area and is shown in Figure 19-2, located in the southeast of the 250m study area, just east of the railway line and is entitled 'Mill Lane', which accepted waste between 1989 and 1990. There is no other information available, such as the waste type accepted.

*Radon*

19.4.133 UKHSA UK radon mapping indicates that the proposed Western Distribution Mains section of the EIA Scoping Area and its study area is not in a Radon Affected Area.

*UXO*

19.4.134 A preliminary review of UXO risk maps has been undertaken on the proposed Western Distribution Mains section of the EIA Scoping Area and its study area and concluded that it is within a low risk of UXO area.

**Baseline Conditions Summary**

19.4.135 A summary of the baseline conditions for each section of the EIA Scoping Area and their respective study area is included in Table 19-5. All distances quoted are approximate.

Table 19-5: Current Baseline Conditions Summary

| Section of the EIA Scoping Area and its Study Area | History                                                                                                                                                                                                                                                                                               | Geology                                                                                                                                                                                                                                                                                                                                            | Hydrogeology                                                                                                                                                                                                     | Hydrology                                                                                                                                                                 | Mining and Mineral Extraction | Waste Management                                                                                                                                                                                                            | Radon                          | UXO                 |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|
| Proposed AWRP                                      | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land use from earliest mapping.</li> </ul>                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>Superficial – Happisburgh Glacigenic Formation, Lowestoft Formation and Corton Woods Member</li> <li>Bedrock – Crag Group</li> </ul>                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Superficial – Secondary A &amp; Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – None</li> <li>Groundwater Abstractions – None</li> </ul>           | <ul style="list-style-type: none"> <li>Surface water features – fishing pond and Hopton Drain to the northeast</li> <li>Surface water Abstractions – None</li> </ul>      | None                          | Historical Landfill: <ul style="list-style-type: none"> <li>‘Oak View Farm’, 125m east of A47</li> </ul>                                                                                                                    | Not within radon affected area | Low risk            |
| Proposed LSO                                       | <ul style="list-style-type: none"> <li>Terrestrial portion predominantly used as farmland, with golf course and holiday homes developed over time, along with Hopton-on-Sea.</li> <li>Coastal and marine portion has remained the same with sea defences along beach having been improved.</li> </ul> | Onshore <ul style="list-style-type: none"> <li>Superficial – Happisburgh Glacigenic Formation, Lowestoft Formation, Blown sand and Corton Woods Member</li> <li>Bedrock – Crag Group</li> </ul> Offshore <ul style="list-style-type: none"> <li>Superficial – Shallow seabed deposits and Marine Deposits</li> <li>Bedrock – Crag Group</li> </ul> | <ul style="list-style-type: none"> <li>Superficial – Secondary A &amp; Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – None</li> <li>Groundwater Abstractions – One historical</li> </ul> | <ul style="list-style-type: none"> <li>Surface water features – various ponds to the north and west</li> <li>Surface water Abstractions - None</li> </ul>                 | None                          | Historical Landfills: <ul style="list-style-type: none"> <li>‘Oak View Farm’, 20m north</li> <li>‘Disused railway cutting off Stirrups Lane’, 20m east</li> <li>‘Station Road’, 180m east</li> <li>‘North Denes’</li> </ul> | Not within radon affected area | Medium to high risk |
| Proposed CSR                                       | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land use from earliest mapping.</li> </ul>                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>Superficial – Lowestoft Formation</li> <li>Bedrock – Crag Group</li> </ul>                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>Superficial – Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – None</li> </ul>          | <ul style="list-style-type: none"> <li>Surface water features – field drain to the south and ponds to the northwest</li> <li>Surface water Abstractions - None</li> </ul> | None                          | None                                                                                                                                                                                                                        | Not within radon affected area | Low risk            |
| Proposed WSR                                       | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land</li> </ul>                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>Superficial – Lowestoft Formation, Head</li> </ul>                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>Superficial – Secondary Undifferentiated</li> <li>Bedrock – Principal</li> </ul>                                                                                          | <ul style="list-style-type: none"> <li>Surface water features – unnamed surface watercourse</li> </ul>                                                                    | None                          | Historical Landfill <ul style="list-style-type: none"> <li>‘Land East of Brome Industrial</li> </ul>                                                                                                                        | Not within radon affected area | Low risk            |



| Section of the EIA Scoping Area and its Study Area | History                                                                                                                                                                                 | Geology                                                                                                                                                                                                     | Hydrogeology                                                                                                                                                                                                                                                                                            | Hydrology                                                                                                                                                                                                                                                                                                                                                                               | Mining and Mineral Extraction                                                                | Waste Management                                                                                                                                                                                                                                                                 | Radon                                          | UXO             |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------|
|                                                    | <p>use from earliest mapping.</p> <ul style="list-style-type: none"> <li>RAF Eye was developed in the 1940s to the south and has been redeveloped into an industrial estate.</li> </ul> | <p>Deposits and Alluvium</p> <ul style="list-style-type: none"> <li>Bedrock – Crag Group</li> </ul>                                                                                                         | <ul style="list-style-type: none"> <li>SPZ – SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – None</li> </ul>                                                                                                                                                                                | <ul style="list-style-type: none"> <li>Surface water Abstractions - None</li> </ul>                                                                                                                                                                                                                                                                                                     |                                                                                              | <p>Estate', 35m east of B1077</p>                                                                                                                                                                                                                                                |                                                |                 |
| Proposed AWRP to River Waveney Pipeline            | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land use from earliest mapping.</li> </ul>                                                                   | <ul style="list-style-type: none"> <li>Superficial – Happisburgh Glacigenic Formation, Lowestoft Formation, Haddiscoe Sand and Gravel Member and Breydon Formation</li> <li>Bedrock – Crag Group</li> </ul> | <ul style="list-style-type: none"> <li>Superficial – Secondary A &amp; Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – Four historical and one active</li> </ul>                                                     | <ul style="list-style-type: none"> <li>Surface water features – Multiple watercourses and water bodies of varying sizes. The River Waveney and The Broads to the east. This section of the study area's extent to the west also extends into The Broads and to a different section of the River Waveney, just south of Ellingham.</li> <li>Surface water Abstractions - None</li> </ul> | <p>Mineral extraction – one quarry 'Kirby Cane Quarry/ Recycling Centre' Historical pits</p> | <p>Historical Landfills</p> <ul style="list-style-type: none"> <li>'Oak View Farm', 160m west</li> <li>'Disused railway cutting off Stirrups Lane', 250m west</li> <li>'Land East of Wheatacre Hill', 250m south</li> <li>'Hollow Way Road'</li> <li>'Hill House Far'</li> </ul> | <p>Not within radon affected area</p>          | <p>Low risk</p> |
| Proposed Barsham WTW to CSR Pipeline               | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land use from earliest mapping</li> </ul>                                                                    | <ul style="list-style-type: none"> <li>Superficial – Lowestoft Formation, Alluvium, Head Deposits and River Terrace Deposits</li> <li>Bedrock – Crag Group</li> </ul>                                       | <ul style="list-style-type: none"> <li>Superficial – Secondary A &amp; Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – SPZ 1 (Inner Protection) and SPZ 2 (Outer Protection) in the north, SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – Two historical</li> </ul> | <ul style="list-style-type: none"> <li>Surface water features – Multiple watercourses and water bodies of varying sizes. Study Area intersects The Beck and The River Blythe to the west and southwest of Halesworth respectively.</li> <li>Surface water Abstractions - None</li> </ul>                                                                                                | <p>Historical pits</p>                                                                       | <p>Historical Landfill</p> <ul style="list-style-type: none"> <li>'Site at Ringsfield', immediately west of Church Road</li> </ul>                                                                                                                                               | <p>Not within radon affected area</p>          | <p>Low risk</p> |
| Proposed CSR to WSR Pipeline                       | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land</li> </ul>                                                                                              | <ul style="list-style-type: none"> <li>Superficial – Lowestoft Formation,</li> </ul>                                                                                                                        | <ul style="list-style-type: none"> <li>Superficial – Secondary A &amp;</li> </ul>                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Surface water features – Multiple watercourses and</li> </ul>                                                                                                                                                                                                                                                                                    | <p>Historical pits</p>                                                                       | <p>Historical Landfills</p>                                                                                                                                                                                                                                                      | <p>Majority of section is not within radon</p> | <p>Low risk</p> |



| Section of the EIA Scoping Area and its Study Area | History                                                                                                                                                                                                                                                                                                                 | Geology                                                                                                                                                        | Hydrogeology                                                                                                                                                                                                              | Hydrology                                                                                                                                                                                                                                                                                                                                 | Mining and Mineral Extraction | Waste Management                                                                                                                                  | Radon                                                                                      | UXO                  |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------|
|                                                    | <p>use from earliest mapping.</p> <ul style="list-style-type: none"> <li>An airfield was located immediately north of Horham during WW2.</li> </ul>                                                                                                                                                                     | <p>Alluvium, Head Deposits and River Terrace Deposits</p> <ul style="list-style-type: none"> <li>Bedrock – Crag Group</li> </ul>                               | <p>Secondary Undifferentiated</p> <ul style="list-style-type: none"> <li>Bedrock – Principal</li> <li>SPZ – SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – None</li> </ul>                                   | <p>water bodies of varying sizes. The River Dove between Eye and Stradbroke. Smaller tributaries and watercourses associated with the River Yox and River Blythe.</p> <ul style="list-style-type: none"> <li>Surface water Abstractions - None</li> </ul>                                                                                 |                               | <ul style="list-style-type: none"> <li>'Land East of Brome Industrial Estate', 200m southwest</li> <li>'Drift Cottage', 215m southwest</li> </ul> | <p>affected area; western portion of the section has a maximum radon potential is 1-3%</p> |                      |
| Proposed CSR to Saxmundham Pipeline                | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land use from earliest mapping.</li> </ul>                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Superficial – Lowestoft Formation, Head Deposits and Alluvium</li> <li>Bedrock – Crag Group</li> </ul>                  | <ul style="list-style-type: none"> <li>Superficial – Secondary A &amp; Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – None</li> </ul> | <ul style="list-style-type: none"> <li>Surface water features – Multiple watercourses and water bodies of varying sizes. This section of the study area intersects The River Yox in the north. Smaller tributaries and watercourses associated with the River Yox and River Fromus.</li> <li>Surface water Abstractions - None</li> </ul> | Historical pits               | <p>Historical Landfill</p> <ul style="list-style-type: none"> <li>'Grove Farm', 35m north of Rendham Road</li> </ul>                              | <p>Not within radon affected area.</p>                                                     | Low risk.            |
| Proposed Saxmundham to SZC Pipeline                | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land use from earliest mapping.</li> <li>Theberton Airfield was constructed and used during the Second World War but was returned to agricultural fields by the 1950s.</li> <li>Sizewell power stations developed from the 1950s,</li> </ul> | <ul style="list-style-type: none"> <li>Superficial – Lowestoft Formation, Peat, Tidal Flat Deposits and Head Deposits</li> <li>Bedrock – Crag Group</li> </ul> | <ul style="list-style-type: none"> <li>Superficial – Secondary A &amp; Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – None</li> </ul> | <ul style="list-style-type: none"> <li>Surface water features – The majority of the surface water features are concentrated in the east of this section of the study area, in the form of ditches part of which are known as the Leiston Ditch. Tributaries and watercourses associated with the Minsmere Old River</li> </ul>            | Historical pits               | None                                                                                                                                              | <p>Not within radon affected area</p>                                                      | Low to moderate risk |

| Section of the EIA Scoping Area and its Study Area | History                                                                                                                                                                                                                            | Geology                                                                                                                                       | Hydrogeology                                                                                                                                                                                            | Hydrology                                                                                                                                                                                                                                                                            | Mining and Mineral Extraction | Waste Management                                                                                                        | Radon                          | UXO       |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------|
|                                                    | which are now all at various stages of decommissioning, construction and operation.                                                                                                                                                |                                                                                                                                               |                                                                                                                                                                                                         | and the River Hundred.<br>• Surface water Abstractions – None.                                                                                                                                                                                                                       |                               |                                                                                                                         |                                |           |
| Proposed Eastern Distribution Mains                | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land use from earliest mapping.</li> <li>RAF Eye was developed in the 1940s to the south and has been redeveloped into an industrial estate.</li> </ul> | <ul style="list-style-type: none"> <li>Superficial – Lowestoft Formation</li> <li>Bedrock – Crag Group</li> </ul>                             | <ul style="list-style-type: none"> <li>Superficial – Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – None</li> </ul> | <ul style="list-style-type: none"> <li>Surface water features - Unnamed surface watercourse runs through this section of the study area. Various small groups of surface water features within this section of the study area.</li> <li>Surface water Abstractions - None</li> </ul> | None                          | Historical Landfill <ul style="list-style-type: none"> <li>'Land East of Brome Industrial Estate', 220m east</li> </ul> | Not within radon affected area | Low risk. |
| Proposed Western Distribution Mains                | <ul style="list-style-type: none"> <li>Predominantly farm and agricultural land use from earliest mapping.</li> <li>Great Eastern Main Line in the southwest, now disused.</li> </ul>                                              | <ul style="list-style-type: none"> <li>Superficial – Lowestoft Formation, Head Deposits and Alluvium</li> <li>Bedrock – Crag Group</li> </ul> | <ul style="list-style-type: none"> <li>Superficial – Secondary Undifferentiated</li> <li>Bedrock – Principal</li> <li>SPZ – SPZ 3 (Total Catchment)</li> <li>Groundwater Abstractions – None</li> </ul> | <ul style="list-style-type: none"> <li>Surface water features – River Dove runs through the north of this section of the study area. Various tributaries in west and east.</li> <li>Surface water Abstractions - None</li> </ul>                                                     | None                          | Historical Landfill <ul style="list-style-type: none"> <li>'Mill Lane', east of railway line</li> </ul>                 | Not within radon affected area | Low risk. |

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### Future Baseline

19.4.136 Based on the available information, in terms of land contamination, land stability and geological designated sites, it is considered that the existing baseline conditions would not materially change without the Proposed Development, as the land would remain in its current use and conditions will only vary through the change of land use and development.

## 19.5 Likely Significant Effects

19.5.1 This section sets out the likely significant effects of the Proposed Development on ground conditions and associated receptors. It assumes that the relevant primary and tertiary mitigation measures as set out below will be in place before assessing the potential likely significant effects. This is in accordance with the Institute of Sustainability and Environmental Professionals' ('ISEP') (formerly the Institute of Environmental Management and Assessment) guidance on Implementing the Mitigation Hierarchy from Concept to Construction (2024) [21].

19.5.2 Based on the baseline conditions assessment, there have been limited land stability issues and geologically sensitive sites identified within the EIA Scoping Area and its study area. Therefore, assessment of the Proposed Development's effects on land stability and geologically sensitive sites is proposed to be scoped out of the ground conditions chapter of the ES, with land contamination scoped in, as this is considered to be the key consideration generating significant effects. Further details are set out in paragraph 19.6.5. In addition, the Proposed Development's construction phase is considered to pose the highest risk to sensitive receptors and therefore a greater potential for likely significant effects in comparison to the operational and decommissioning phases.

### Receptors

19.5.3 Likely significant effects from the Proposed Development in relation to contamination on the following sensitive receptors are anticipated to be assessed in the ground conditions chapter of the ES:

- 
- Human Health:
    - Construction workers.
    - Existing land users.
    - Future land users.
    - Neighbours and surrounding land users.
  - Controlled Waters:
    - Underlying Aquifers (Secondary A and Undifferentiated and Principal).
    - Surface water features (for example, the River Waveney and The Broads).
    - Intertidal and coastal features (The North Sea).
  - Built Development:
    - Newly built infrastructure, assets and structures (above and below ground).
    - Existing infrastructure, assets and structures (above and below ground).
- 19.5.4 The receptors proposed to be scoped out of the assessment in the ground conditions chapter of the ES comprise:
- Built Development (only effects from land instability are proposed to be scoped out of the assessment).
  - Geological Designated Sites.
- 19.5.5 Supporting justification for the receptors proposed to be scoped out of the assessment is set out in Section 19.6.
- Land Contamination**
- Disturbance and Mobilisation of Existing Contamination – Construction Phase*
- 19.5.6 There is potential for likely significant effects of existing contamination to be encountered within the EIA Scoping Area and its study area during the Proposed Development's construction phase due to the presence of various
-

historical pits, landfills and variable Made Ground, resulting in impacts and effects on the sensitive receptors stated in paragraph 19.5.3 above.

- 19.5.7 Further assessment of the EIA Scoping Area and its study area is required to identify any potential sources of significant existing contamination, and potential source-pathway-receptor linkages. No ground investigation works have been undertaken at the time of writing this chapter but will be undertaken to inform the evolution of the design of the Proposed Development and will be used to inform the assessment in the ground conditions chapter of the ES, where available. Therefore, as the potential for disturbance and mobilisation of existing contamination during the construction phase cannot be ruled out at this scoping stage, it is proposed to be scoped into the assessment in the ES.

*Discovery of Unexpected Contamination – Construction Phase*

- 19.5.8 There is potential for unexpected contamination to be encountered within the EIA Scoping Area and its study area during the construction phase, resulting in impacts and effects on sensitive receptors (including human health, controlled waters and built development). Although mitigation measures to be implemented include the development of a protocol for dealing with unexpected contamination in accordance with the EA's LCRM Guidance, due to the nature of the EIA Scoping Area and its study area as predominantly comprising agricultural land, there is the potential for undocumented disposal of waste materials or animal carcasses.
- 19.5.9 Therefore, the potential for unexpected contamination during the construction phase cannot be ruled out at this scoping stage and it is proposed to be scoped into the assessment in ground conditions chapter of the ES.

*Introduction of New Contamination – Construction, Operational and Decommissioning Phases*

- 19.5.10 Contamination releases and the introduction of new sources of contamination into the environment (for example, uncontrolled leaks, spills from machinery and bentonite/drilling mud breakout) during the

construction, operational and decommissioning phases of the Proposed Development have the potential to result in impacts and effects on sensitive receptors via pathways such as vertical and/or lateral migration or direct contact.

- 19.5.11 The Proposed Development is at an early design stage and will be reviewed as it evolves to identify any potential impacts from the introduction of new contamination, specifically from the potential bentonite/drilling mud breakouts at proposed trenchless crossings. The exact construction methodology of the trenchless crossings is yet to be determined at this scoping stage. However, some of these methodologies may involve the use of bentonite.
- 19.5.12 Therefore, as the potential introduction of new contamination during the Proposed Development's construction, operational and decommissioning phases cannot be ruled out at this scoping stage, it is proposed to be scoped into the assessment in the ground conditions chapter of the ES due to the current uncertainty with the construction methods and lack of available baseline data at this stage.

## 19.6 Impacts Scoped Out of the Assessment

### Land Contamination

#### *Disturbance and Mobilisation of Existing Contamination – Operational and Decommissioning Phases*

- 19.6.1 In the event that existing contamination is identified within the EIA Scoping Area and its study area, which has the potential to impact on sensitive receptors (including human health, controlled waters and built development), this would be appropriately dealt with during the construction phase of the Proposed Development, i.e. assessment and remediation (as appropriate) in accordance with the EA's LCRM Guidance, to ensure the Proposed Development is suitable for the proposed end use. Therefore, significant effects from the disturbance and mobilisation of existing contamination during the operational and decommissioning phases of the

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Proposed Development are considered unlikely and proposed to be scoped out of the assessment in the ground conditions chapter of the ES.

*Discovery of Unexpected Contamination – Operational and Decommissioning Phases*

- 19.6.2 As any unexpected contamination identified would be dealt with during the construction phase of the Proposed Development, significant effects from the discovery of unexpected contamination during the operational and decommissioning phases are considered unlikely and an assessment of these effects is therefore proposed to be scoped out of the assessment in the ground conditions chapter of the ES.

*Damage to Construction Materials from Contamination or Aggressive Ground Conditions – Construction, Operational and Decommissioning Phases*

- 19.6.3 There is potential for contamination or aggressive ground conditions to be present within the EIA Scoping Area and its study area during the construction phase resulting in impacts and effects on building materials such as concrete and pipes. Chemical data will be obtained as part of ground investigation works which will be used to inform concrete design and selection of pipe materials in accordance with Building Research Establishment [22] and UK Water Industry Research [23] guidance. Therefore, potential significant effects are unlikely, and damage to construction materials from contamination or aggressive ground conditions during the construction phase is proposed to be scoped out of the assessment in the ground conditions chapter of the ES.
- 19.6.4 In the event that contamination or aggressive ground conditions are identified within the EIA Scoping Area and its study area, which has the potential to impact on construction materials, this would be appropriately dealt with during the construction phase of the Proposed Development, i.e. during design and implemented in the construction phase, to ensure the Proposed Development is suitable for the proposed end use. Therefore, significant effects from the presence of contamination or aggressive ground conditions during the operational and decommissioning phases are



considered unlikely and an assessment of these effects is therefore proposed to be scoped out of the assessment in the ground conditions chapter of the ES.

### Land Stability

#### *Damage to Infrastructure, Assets and Structures from Geohazards and Ground Instability – Construction, Operational and Decommissioning Phases*

- 19.6.5 Ground instability in relation to site-specific ground conditions and geohazards has the potential to impact the Proposed Development and third-party assets. However, no ground stability issues have been identified in the baseline conditions assessment, with the exception of the proposed LSO section of the EIA Scoping Area and its study area. Due to the nature of the coastline, in which the proposed LSO pipeline options (Options 1, 2 and 3) would be installed, long-term cliff instability and coastal erosion have been identified as a risk. Although conventional methods will not be a feasible solution for the Proposed Development, assessment following intrusive investigations will inform design solutions to be implemented, such as directional drilling in which the entry point has been set back from the retreating cliff face to avoid exposure for the intended design life. Therefore, the consideration of site-specific conditions in the design phase of the proposed LSO options would result in no significant effects to the new infrastructure or third-party assets.
- 19.6.6 Strata such as Made Ground, Alluvium and Peat are likely to be low strength and/or high compressibility and susceptible to volume change (shrink/swell) and therefore be unsuitable bearing strata. However, these issues and any further evidence of geohazards or ground instability that may be identified during future ground investigation, will be considered during the design evolution of the Proposed Development and in the ES, which would include (in accordance with best practice and industry guidance) suitable consideration of site-specific ground conditions, potential ground instability and geohazard risks based on site-specific ground investigation, such that new infrastructure and third-party assets would not



be adversely affected and therefore significant effects are not considered likely. Therefore, geohazards and ground instability is proposed to be scoped out of the assessment in the ground conditions chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

### Geological Designated Sites

#### *Damage to designated Sites of Geological Importance – Construction, Operational and Decommissioning Phases*

- 19.6.7 One site of geological importance or geological SSSI, which is an active quarry site, has been identified within the proposed AWRP to River Waveney Pipeline section 250m study area, but not within the respective section of the EIA Scoping Area, as shown in Figure 19-3, and therefore is unlikely to be affected by the Proposed Development due to distance (it is located on the boundary of the 250m study area). On this basis, the Proposed Development will not interact with geological designated sites, and significant effects are considered unlikely. Therefore, geological designated sites are proposed to be scoped out of the assessment in the ground conditions chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

## 19.7 Proposed Approach to Mitigation

- 19.7.1 The likely mitigation measures that may be used to avoid, reduce or offset likely significant adverse effects are outlined below.

### Primary (Inherent) Mitigation

- 19.7.2 Primary mitigation is an inherent part of the Proposed Development's design. The following measures are relevant to the ground conditions assessment:
- Sensitive routeing and siting of infrastructure and temporary works to avoid sensitive features, as far as is practicable, such as geologically designated SSSIs and authorised and historical landfills.
  - Incorporating suitable consideration of the ground conditions in the design based on data from site-specific ground investigation and assessment, and therefore that any risks from ground instability,

chemical aggressivity [24] of the ground, UXO/UXB, ground gases and radon reports would be considered within the evolution of the design of the Proposed Development in accordance with good practice.

### Secondary (Foreseeable) Mitigation

19.7.3 The following secondary mitigation measures are considered necessary for the ground conditions assessment:

- Geo-environmental and geotechnical intrusive and non-intrusive ground investigation and assessment would be undertaken in accordance with current best practice including the British Standards Institution's ('BSI') BS5930 [25], BS10175 [26] and Eurocode 7 [27],[28] which would inform, if required, a Remediation Strategy and Verification Plan ('RSVP'), slope stability assessments, foundation design, and piling risk assessments, where appropriate. This would be undertaken as part of the detailed pre-construction survey and design for implementation during construction.
- A Foundation Works Risk Assessment ('FWRA') will be undertaken by the contractor where the use of piled foundations is anticipated and at trenchless crossings. The contractor will utilise construction methods such as appropriate piling techniques to minimise and avoid the risk of introducing new contamination (if required), creating new contamination pathways, and mixing of aquifer bodies. The FWRA would be undertaken once the proposed foundation solutions are known in accordance with the EA's Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention [29].
- The provision of a drilling fluid breakout method statement, where horizontal directional drilling is proposed at trenchless locations, will be developed by the Main Works Contractor(s), and will be informed by sufficient appropriate ground investigation and will include:
  - Detailed and appropriate design of all trenchless crossings including demonstration of a suitable drilling profile and depth to mitigate the risk of breakout.
  - Description of drilling procedure and demonstration of suitability, including removal of borehole cuttings during drilling.
  - Annular pressure monitoring.
  - Regular walkovers of the drill path to check for visible evidence of breakouts.
  - Measures to limit the volume of the drilling fluid loss.
  - Measures to contain the lost drilling fluid.
  - Measures to remove the lost drilling fluid.
  - Measures to seal the area of the breakout.
  - Measures to provide any remediation, if appropriate.

- A protocol for dealing within any unexpected contamination will be developed by the Main Works Contractor(s) and include:
  - Details of a watching brief and toolbox talks to be implemented throughout the construction phase.
  - Details regarding how any affected area will be delineated, protected, investigated and assessed.
  - The qualifications and competencies of the person appointed to oversee the works.
  - The preparation of a method statement for how the contamination will be dealt with or remediated (as appropriate).
  - An escalation policy describing when and how any notifications and approvals will be agreed with the relevant Local Planning Authorities.
  - Details of verification procedures for any mitigation or remediation works.

### Tertiary (Inexorable) Mitigation

19.7.4 The following tertiary mitigation measures are relevant to the ground conditions assessment:

- Use of appropriate occupational health and safety measures e.g. Personal Protective Equipment ('PPE'), and statutory health and safety compliance (e.g. compliance with The Confined Spaces Regulations 1997 [30] in relation to ground gas from working in confined spaces/trenches) to minimise the risks associated with anticipated/unexpected contamination which is based on risk assessment informed by site specific information.
- Appropriate training of construction and maintenance workers in the handling and use of potentially hazardous substances and the associated risks.
- All use and storage of chemicals and fuels are to be undertaken in accordance with EA guidance and The Control of Pollution (Oil Storage) (England) Regulations 2001 [31]. The use and storage of chemicals and fuels will also be controlled and monitored under the requirements of a Construction Environmental Management Plan ('CEMP') and Decommissioning Environmental Management Plan ('DEMP') in accordance with the Outline Construction Environmental Management Plan ('OCEMP') and Outline Decommissioning Environmental Management Plan ('ODEMP'), respectively, to be submitted in support of the DCO application. This will include, for example, procedures for good general construction site practices, environmental and waste management procedures, regular vehicle checks, use of spill kits, correct waste storage and disposal, use of oil-water separators as necessary (for example, for drainage from refuelling areas), collection of process water from the washout/ cleaning of ready-mix concrete vehicles and equipment for treatment/disposal.

- The control of earthworks or materials movement (including any re-use of materials) will be carried out under appropriate Environmental Permits, exemptions, or Materials Management Plans ('MMP') for each section, based on the Outline Materials Management Plan ('OMMP') being prepared in accordance with CL: AIRE's The Definition of Waste: The Development Industry Code of Practice (2011) [32].
- Stripping, storage and reuse of topsoils and subsoils will be carried out under a Soils Management Plan ('SMP') for each section, based on the Outline Soils Management Plan ('OSMP') as discussed in chapter 20.

## 19.8 Proposed Approach to the ES

19.8.1 This section describes the proposed scope, methodology and guidance to be used for the ground conditions chapter of the ES to determine the baseline conditions, sensitivity of receptors and magnitude of effects and sets out the significance criteria that will be used for the ground conditions assessment.

### Best Practice Guidance

19.8.2 The ground conditions assessment will be carried out in accordance with the following good practice guidance documents:

- LCRM Guidance [33].
- CIRIA's CIRIA 552: Contaminated Land Risk Assessment, A Guide to Good Practice (2001) [34].
- BSI's BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites. Code of Practice [35].
- The DMRB LA 109 Guidance [36].
- National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 113 Road Drainage and the Water Environment [37] ( the 'DMRB LA 113 Guidance').

19.8.3 Whilst the DMRB LA 109 Guidance and the DMRB LA 113 Guidance were published by National Highways (formerly Highways England) to inform the assessment of highways schemes, the use of these guidance documents for assessing impacts on ground conditions for other types of projects, including of the scale, size and nature of the Proposed Development is a widely accepted approach.

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## Assessment Methodology

- 19.8.4 This section sets out the proposed methodology for the assessment of likely significant effects on ground conditions in the ES. This is based on professional judgement and previous experience, together with the best practice guidance outlined in paragraph 19.8.2.
- 19.8.5 The baseline information will be used to identify potential source-pathway-receptor linkages and inform a risk-based assessment of the effects of the Proposed Development in relation to geology and hydrogeology. The risk-based assessment will be undertaken following a staged approach as recommended by guidance provided in the LCRM Guidance. This presents a three-stage process to the management of contaminated land:
- Stage 1 – risk assessment.
  - Stage 2 – options appraisal.
  - Stage 3 – remediation.
- 19.8.6 The Stage 1 risk assessment is undertaken in a phased manner, comprising three tiers, with progression through the different tiers dependant on the outcome of each previous tier, as follows:
- Tier 1 – Preliminary Risk Assessment ('PRA'): a qualitative assessment of historical and published information in order to develop a preliminary CSM to inform a preliminary risk assessment.
  - Tier 2 – Generic Risk Assessment: a quantitative assessment using published criteria to screen site specific ground condition data.
  - Tier 3 – Detailed Risk Assessment: a quantitative assessment involving the generation of site-specific assessment criteria.
- 19.8.7 The proposed assessment approach in the ground conditions chapter of the ES will be based on desk-based study information. In accordance with the Planning Inspectorate's NSIPs: Pre-Application Advice on Environmental Impact Assessment (July 2026) [38], a '*cautious 'worst case' approach*' to assumptions regarding the likely ground conditions would be made when assessing effects in the ES, determined from the desk-based study information.
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- 19.8.8 In the ground conditions chapter of the ES, potential contamination linkages with the Proposed Development will be identified and assigned a risk rating based on the potential for significant contamination to be present.
- 19.8.9 Those sources which are assessed to have a moderate, high or very high potential risk of contamination will be taken forward for further assessment to ensure that effects are assessed in areas where the potential for significant effects is likely. Where a very low or low risk rating is assessed, these areas will not be taken forward for further assessment in the ES on the basis they have a low likelihood of significant effects.
- 19.8.10 In order to evaluate whether the presence of a source of contamination could potentially lead to harmful consequences, a source-pathway-receptor methodology is adopted. The underlying principle of the assessment is that the identification of pollutant linkages consists of the following three elements:
- A source/hazard (a substance or situation that has the potential to cause harm or pollution).
  - A pathway (a means by which the hazard moves along/generates exposure).
  - A receptor/target (an entity that is vulnerable to the potential adverse effects of the hazard).
- 19.8.11 Whilst the contamination may be a hazard, it would not constitute a risk unless a pathway and sensitive receptor are also present, and a pollutant linkage can be determined. Therefore, in assessing the potential for contamination to cause a significant effect: the extent and nature of the potential source or sources of contamination must be assessed; any pathways present must be identified; and sensitive receptors or resources must be identified and appraised to determine their value and sensitivity to contamination related impacts.
- 19.8.12 The methodology adopted in this chapter is qualitative, with a progression from factual information (stated with reasonable certainty) regarding the baseline conditions and to appraisal informed by professional judgement on the relative significance. The assessment methodology to be adopted in the
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ground conditions chapter of the ES is qualitative, based on best available baseline data, and informed by professional judgement and best practice guidance on the significance of effects from the Proposed Development. It should be noted that there are some differences from the criteria set out in chapter 3 EIA methodology due to the application of the DMRB LA 109 Guidance and the DMRB LA 113 Guidance.

### Sensitivity of Receptors

19.8.13 The criteria used to determine the value and sensitivity of receptors for the ground conditions assessment are set out in Table 19-6. These values are based on Table 3.70 of the DMRB LA 113 Guidance [39], Table 3.11 of the DMRB LA 109 Guidance [40] and professional judgement.

Table 19-6: Value/Sensitivity Criteria

| Value/Sensitivity | General Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very High         | <p>Very high importance and rarity. International scale and limited potential for substitution.</p> <p><b>Contamination:</b></p> <ol style="list-style-type: none"> <li>1) Human health: very high sensitivity land use such as residential or allotments.</li> <li>2) Surface water: Watercourses having a WFD classification of 'high'. Surface water sites protected/designated under EC or UK legislation, Special Areas of Conservation, Special Protection Areas, SSSIs, Ramsar sites).</li> <li>3) Groundwater: Principal aquifer providing a regionally important resource and regionally important public water supplies, groundwater SPZ 1.</li> </ol> <p><b>Land Instability:</b></p> <p>Residential, commercial, education and employment development, motorways and A roads, mainline railway line, power transmission lines (grid), gas/oil pipelines.</p> <p><b>Geology:</b></p> <p>Very rare and of international importance with no potential for replacement (e.g. UNESCO World Heritage Sites, UNESCO Global Geoparks, SSSIs and Geological Conservation Review Sites, where citations indicate features of international importance). Geology meeting international designation criteria which is not designated as such.</p> |
| High              | <p>High importance and rarity. National scale and limited potential for substitution.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



| Value/Sensitivity | General Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | <p><b>Contamination:</b></p> <ol style="list-style-type: none"> <li>1) Human health: high sensitivity land use such as public open space.</li> <li>2) Surface water: Watercourses having a WFD classification of 'good'.</li> <li>3) Groundwater: Principal aquifer providing locally important resource or supporting a river ecosystem, groundwater SPZ 2.</li> </ol> <p><b>Land Instability:</b><br/>Dual carriageway, B roads, branch line railway, power distribution lines (local).</p> <p><b>Geology:</b><br/>Rare and of national importance with little potential for replacement (e.g. geological SSSI, National Nature Reserves). Geology meeting national designation citation criteria which is not designated as such.</p> |
| Medium            | <p>Medium or high importance and rarity, regional scale, limited potential for substitution.</p> <p><b>Contamination:</b></p> <ol style="list-style-type: none"> <li>1) Human health: medium sensitivity land use such as commercial or industrial.</li> <li>2) Surface water: Watercourses having a WFD classification of 'moderate'.</li> <li>3) Groundwater: Secondary A Aquifers and groundwater SPZ 3.</li> </ol> <p><b>Land Instability:</b><br/>Local services and C roads only.</p> <p><b>Geology:</b><br/>Regional importance with limited potential for replacement (e.g. Regionally Important Geological Sites). Geology meeting regional designation citation criteria which is not designated as such.</p>                  |
| Low               | <p>Low or medium importance and rarity, local scale.</p> <p><b>Contamination:</b></p> <ol style="list-style-type: none"> <li>1) Human health: low sensitivity land use such as highways and rail.</li> <li>2) Surface water: Watercourses having a WFD classification of 'poor'.</li> <li>3) Groundwater: Secondary B aquifer or Secondary Undifferentiated aquifer.</li> </ol> <p><b>Land Instability:</b><br/>Non-permanent structures.</p> <p><b>Geology:</b></p>                                                                                                                                                                                                                                                                     |



| Value/Sensitivity | General Criteria                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Local importance/interest with potential for replacement (e.g. non-designated geological exposures, former quarries/mining sites).                                                                                                                                                                                                                                                                                                             |
| Negligible        | <p>Very low importance and rarity, local scale.</p> <p><b>Contamination:</b></p> <ol style="list-style-type: none"> <li>1) Human health: undeveloped surplus land/no sensitive land use proposed.</li> <li>2) Surface water: not present.</li> <li>3) Groundwater: Unproductive strata.</li> </ol> <p><b>Land Instability:</b></p> <p>No infrastructure.</p> <p><b>Geology:</b></p> <p>No geological exposures, limited/no local interest.</p> |

### Impact Magnitude

19.8.14 The criteria used to determine the magnitude of change for ground conditions are set out in Table 19-7. These values are based on Table 3.12 of the DMRB LA 109 Guidance [41] and professional judgement.

Table 19-7: Magnitude Criteria

| Magnitude | General Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Major     | <p><b>Contamination Adverse:</b> significant existing contamination or newly introduced as a result of the Proposed Development identified, and contamination level significantly exceed human health and environmental assessment criteria with the potential for significant harm to be caused. Contamination heavily restricts future use of land.</p> <p><b>Contamination Beneficial:</b> substantial betterment of existing ground or groundwater quality/contamination conditions through remediation and/or mitigation.</p> <p><b>Land Instability Adverse:</b> severe damage to or total loss of asset/infrastructure.</p> <p><b>Land Instability Beneficial:</b> major improvement to asset/infrastructure.</p> <p><b>Geology Adverse:</b> loss of geological feature/designation and/or quality and integrity, severe damage to key characteristics, features or elements.</p> <p><b>Geology Beneficial:</b> N/A.</p> |
| Moderate  | <p><b>Contamination Adverse:</b> existing contamination levels or newly introduced contamination levels as a result of the Proposed Development marginally exceed human health and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Magnitude  | General Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | <p>environment assessment criteria. Control/remediation measures are required to reduce risks to human health/make land suitable for intended use.</p> <p><b>Contamination Benefit:</b> moderate betterment of existing ground or groundwater quality/contamination conditions through remediation and/or mitigation.</p> <p><b>Land Instability Adverse:</b> measurable damage to key characteristics or partial loss of asset/infrastructure requiring partial replacement.</p> <p><b>Land Instability Beneficial:</b> measurable improvement to key characteristics of asset/infrastructure.</p> <p><b>Geology Adverse:</b> partial loss of geological feature/designation, potentially adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.</p> <p><b>Geology Beneficial:</b> N/A</p>                                                                                                                                                                                                                         |
| Minor      | <p><b>Contamination Adverse:</b> existing contamination levels or newly introduced contamination levels as a result of the Proposed Development below human health and environment assessment criteria and remediation is not required. Significant contamination is unlikely with a low risk to human health. Best practice measures can be required to minimise risks to human health.</p> <p><b>Contamination Benefit:</b> slight betterment of existing ground or groundwater quality/contamination conditions through remediation and/or mitigation.</p> <p><b>Land Instability Adverse:</b> minor alteration to key characteristics of asset/infrastructure, requiring repair.</p> <p><b>Land Instability Beneficial:</b> minor addition to key characteristics of asset/infrastructure.</p> <p><b>Geology Adverse:</b> minor measurable change in geological feature/designation attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.</p> <p><b>Geology Beneficial:</b> N/A</p> |
| Negligible | <p><b>Contamination:</b> existing contamination levels or newly introduced contamination levels as a result of the Proposed Development substantially below human health and environment assessment criteria and remediation is not required. No requirement for control measures to reduce risks to human health/make land suitable for intended use.</p> <p><b>Land Instability Adverse:</b> Very minor observable loss or alteration of asset/infrastructure.</p> <p><b>Land Instability Beneficial:</b> Very minor observable positive addition or alteration of asset/infrastructure.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Magnitude | General Criteria                                                                                                                                                                                                                                   |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <p><b>Geology Adverse:</b> very minor loss or detrimental alteration to one or more characteristics, features or elements of geological feature/designation. Overall integrity of resource not affected.</p> <p><b>Geology Beneficial:</b> N/A</p> |

### Significance of Effect

- 19.8.15 Significance would be derived using the matrix set out in chapter 3 EIA methodology. This may be supplemented/informed by professional judgement, which, where used, would be explained to give the rationale behind the values assigned. Significant effects, in the context of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [42] and The Marine Works (Environmental Impact Assessment) Regulations 2007 [43] (as amended in 2017 [44]), would be effects of moderate or greater significance.

### Mitigation and Residual Effects

- 19.8.16 The ground conditions chapter of the ES will assess effects both before and after the implementation of mitigation measures, distinguishing between primary, secondary and tertiary mitigation measures. Where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES. Further details are provided in chapter 3 EIA methodology.

### In-combination Effects

- 19.8.17 Intra-project effects could occur on surface water, groundwater and ecological receptors. Where such likely significant intra-project effects occur, assessment will generally be reported in the ES chapter within the topic area that the receptor falls. Further information is presented below.
- 19.8.18 Likely significant effects of the Proposed Development on ecological receptors, including those supported by groundwater and surface water, will be considered within the terrestrial biodiversity and freshwater biodiversity chapters of the ES. However, the ground conditions chapter of the ES will

identify where potential land contamination within the EIA Scoping Area and its study area may impact groundwater or surface water that may be supporting these ecological receptors.

- 19.8.19 Likely significant effects of the Proposed Development on surface water and groundwater receptors, in terms of the WFD or deterioration of the WFD status, and subsequent impacts to groundwater receptors such as abstractions, springs or groundwater dependant terrestrial ecosystems, will be considered in the water environment chapter of the ES. However, the ground conditions chapter of the ES will identify where land contamination within the EIA Scoping Area and its study area may impact groundwater or surface water.

### Limitations and Assumptions

- 19.8.20 The proposed assessment approach in this chapter is based on published and readily available information, in accordance with a proportionate and robust approach. ‘*Cautious ‘worst case’’* assumptions regarding the likely ground conditions have been made when assessing effects, determined from the available baseline data and the early stage of the design of the Proposed Development at this scoping stage. At this scoping stage, based on this information, it is not considered that specific intrusive ground investigation data is required to support the assessment of likely significant effects in relation to ground conditions in the ES.
- 19.8.21 Historical maps and aerial photographs used as part of the desk-based studies provide a ‘snapshot’ in time of the conditions or activities within the EIA Scoping Area and its study area, and as such cannot be relied upon as indicators of any events or activities that may have taken place at other times.
- 19.8.22 Any changes to the existing hydrological regime of watercourses during the operational phase of the Proposed Development are not expected to result in likely significant ground conditions effects on sensitive receptors.

19.8.23 The key parameters and assumptions considered within the assessment include:

- Piling assumptions: Percussive piling may be required for the proposed AWRP component and pumping station subsidiary component of the Proposed Development, depending on ground conditions. The assessment set out in this chapter assumes that piling is required (as a *cautious ‘worst case’* scenario).
- Abstractions and discharges: it is assumed that any new abstractions or discharges will be subject to their own relevant permit applications.
- The assessment of likely significant effects in the ground conditions chapter of the ES will assess the maximum parameters and *‘cautious ‘worst case’* in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s Pre-Application Advice on Environmental Impact Assessment (July 2026) reference to basing assessments on a *‘cautious ‘worst case’ approach’*.

## 19.9 Summary of Impacts and Effects

19.9.1 Table 19-8 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is proposed to be scoped into or out of the assessment in the ground conditions chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 19-8: Summary of Ground Conditions Scope

| Receptor                                                                                                                                                                                       | Effects                                                 | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                           | Scoped in/ Scoped out |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Construction Phase</b>                                                                                                                                                                      |                                                         |                       |                                     |                                                |                                                                                                                      |                       |
| Human Health:<br><ul style="list-style-type: none"> <li>Construction workers</li> <li>Existing land users</li> <li>Future land users</li> <li>Neighbours and surrounding land users</li> </ul> | Disturbance and mobilisation of existing contamination. | Low - Moderate        | High                                | Significant                                    | Sensitive routing, design based on data from site-specific ground investigation and implementation of RSVP and FWRA. | Scoped in             |
|                                                                                                                                                                                                | Discovery of unexpected contamination.                  | Low - Moderate        | High                                | Significant                                    | Sensitive routing, design based on data from site-specific ground investigation and implementation of RSVP.          | Scoped in             |
|                                                                                                                                                                                                | Introduction of new contamination.                      | Low - Moderate        | High                                | Significant                                    | Implementation of measures set out in a CEMP in accordance with the OCEMP, OMMP/MMPs and RSVP.                       | Scoped in             |
| Controlled Waters:                                                                                                                                                                             | Disturbance and mobilisation of                         | Low - Moderate        | High - Medium                       | Significant                                    | Implementation of measures set out in                                                                                | Scoped in             |

| Receptor                                                                                                                                                                                                                                                           | Effects                                                                              | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                     | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------|
| <ul style="list-style-type: none"> <li>Underlying aquifers (Secondary A, Secondary Undifferentiated, Principal)</li> <li>Surface water features (for example the River Waveney and The Broads)</li> <li>Intertidal and coastal features (The North Sea)</li> </ul> | existing contamination.                                                              |                       |                                    |                                                | a CEMP in accordance with the OCEMP, RSVP and FWRA.                                            |                       |
|                                                                                                                                                                                                                                                                    | Discovery of unexpected contamination                                                | Low - Moderate        | High - Medium                      | Significant                                    | Implementation of measures set out in a CEMP in accordance with the OCEMP and RSVP.            | Scoped in             |
|                                                                                                                                                                                                                                                                    | Introduction of new contamination.                                                   | Low - Moderate        | High - Medium                      | Significant                                    | Implementation of measures set out in a CEMP in accordance with the OCEMP, OMMP/MMPs and RSVP. | Scoped in             |
| Built Development <ul style="list-style-type: none"> <li>Newly built infrastructure, assets and structures (above and below ground)</li> <li>Existing infrastructure, assets and</li> </ul>                                                                        | Damage to construction materials from contamination or aggressive ground conditions. | Minor                 | Medium - Low                       | Not significant                                | Primary design mitigation informed by data from site-specific ground investigation.            | Scoped out            |
|                                                                                                                                                                                                                                                                    | Damage to infrastructure, assets and                                                 | Negligible            | High - Low                         | Not significant                                | Primary design mitigation informed by data from site-                                          | Scoped out            |

| Receptor                                                                                                                                                                                       | Effects                                                 | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures     | Scoped in/ Scoped out |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|--------------------------------|-----------------------|
| structures (above and below ground)                                                                                                                                                            | structures from geohazards and ground instability.      |                       |                                     |                                                | specific ground investigation. |                       |
| Geological Designated Sites                                                                                                                                                                    | Damage to designated sites of geological importance.    | Negligible            | High and Negligible                 | Not Significant                                | None required.                 | Scoped out            |
| <b>Operational Phase</b>                                                                                                                                                                       |                                                         |                       |                                     |                                                |                                |                       |
| Human Health:<br><ul style="list-style-type: none"> <li>Construction workers</li> <li>Existing land users</li> <li>Future land users</li> <li>Neighbours and surrounding land users</li> </ul> | Disturbance and mobilisation of existing contamination. | Negligible            | High                                | Not Significant                                | None required.                 | Scoped out            |
|                                                                                                                                                                                                | Discovery of unexpected contamination.                  | Negligible            | High                                | Not Significant                                | None required.                 | Scoped out            |
|                                                                                                                                                                                                | Introduction of new contamination.                      | Low - Moderate        | High                                | Significant                                    | None required.                 | Scoped in             |
| Controlled Waters:<br><ul style="list-style-type: none"> <li>Underlying aquifers (Secondary A, Secondary Undifferentiated, Principal)</li> </ul>                                               | Disturbance and mobilisation of existing contamination. | Negligible            | High - Medium                       | Not Significant                                | None required.                 | Scoped out            |
|                                                                                                                                                                                                | Discovery of unexpected contamination.                  | Negligible            | High - Medium                       | Not Significant                                | None required.                 | Scoped out            |



| Receptor                                                                                                                                                                                                                        | Effects                                                                                 | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/ Scoped out |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------|-----------------------|
| <ul style="list-style-type: none"> <li>Surface water features (for example the River Waveney and The Broads)</li> <li>Intertidal and coastal features (The North Sea)</li> </ul>                                                | Introduction of new contamination.                                                      | Low - Moderate        | High - Medium                       | Significant                                    | None required.             | Scoped in             |
| Built Development <ul style="list-style-type: none"> <li>Newly built infrastructure, assets and structures (above and below ground)</li> <li>Existing infrastructure, assets and structures (above and below ground)</li> </ul> | Damage to construction materials from contamination or aggressive ground conditions.    | Negligible            | Medium - Low                        | Not Significant                                | None required.             | Scoped out            |
|                                                                                                                                                                                                                                 | Damage to infrastructure, assets and structures from geohazards and ground instability. | Negligible            | High - Low                          | Not significant                                | None required              | Scoped out            |
| Sites of geological importance                                                                                                                                                                                                  | Damage to designated sites of geological importance.                                    | Negligible            | High and Negligible                 | Not significant                                | None required              | Scoped out            |

| Receptor                                                                                                                                                                                               | Effects                                                 | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                          | Scoped in/ Scoped out |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Decommissioning Phase</b>                                                                                                                                                                           |                                                         |                       |                                     |                                                |                                                                                                                     |                       |
| Human Health:<br><ul style="list-style-type: none"> <li>• construction workers</li> <li>• Existing land users</li> <li>• Future land users</li> <li>• Neighbours and surrounding land users</li> </ul> | Disturbance and mobilisation of existing contamination. | Negligible            | High                                | Not Significant                                | Implementation of measures set out in a DEMP in accordance with the ODEMP.                                          | Scoped out            |
|                                                                                                                                                                                                        | Discovery of unexpected contamination.                  | Negligible            | High                                | Not Significant                                | Implementation of discovery strategy set out in RSVP.                                                               | Scoped out            |
|                                                                                                                                                                                                        | Introduction of new contamination.                      | Low - Medium          | High                                | Significant                                    | Implementation of measures set out in a DEMP in accordance with the ODEMP and in a MMP in accordance with the OMMP. | Scoped in             |
| Controlled Waters:<br><ul style="list-style-type: none"> <li>• Underlying aquifers (Secondary A, Secondary Undifferentiated, Principal)</li> </ul>                                                     | Disturbance and mobilisation of existing contamination. | Negligible            | High - Medium                       | Not Significant                                | None required.                                                                                                      | Scoped out            |
|                                                                                                                                                                                                        | Discovery of unexpected contamination.                  | Negligible            | High - Medium                       | Not Significant                                | Implementation of discovery strategy set out in RSVP.                                                               | Scoped out            |

| Receptor                                                                                                                                                                                                                        | Effects                                                                                 | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                          | Scoped in/ Scoped out |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------|
| <ul style="list-style-type: none"> <li>Surface water features (for example, the River Waveney and The Broads)</li> <li>Intertidal and coastal features (The North Sea)</li> </ul>                                               | Introduction of new contamination.                                                      | Low - Medium          | High - Medium                      | Significant                                    | Implementation of measures set out in a DEMP in accordance with the ODEMP and in a MMP in accordance with the OMMP. | Scoped in             |
| Built Development <ul style="list-style-type: none"> <li>Newly built infrastructure, assets and structures (above and below ground)</li> <li>Existing infrastructure, assets and structures (above and below ground)</li> </ul> | Damage to construction materials from contamination or aggressive ground conditions.    | Negligible            | Medium - Low                       | Not Significant                                | None required.                                                                                                      | Scoped out            |
|                                                                                                                                                                                                                                 | Damage to infrastructure, assets and structures from geohazards and ground instability. | Negligible            | High - Low                         | Not Significant                                | None required.                                                                                                      | Scoped out            |
| Geological Designated Sites                                                                                                                                                                                                     | Damage to designated sites of geological importance                                     | Negligible            | High and Negligible                | Not Significant                                | None required.                                                                                                      | Scoped out            |

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## 20 Agricultural Land and Soils

### 20.1 Introduction

20.1.1 This chapter defines the proposed scope for the assessment of likely significant effects on agricultural land and soils to be presented within the Environmental Statement ('ES') submitted in support of the application for a Development Consent Order ('DCO'). It identifies the relevant agriculture and soil receptors that could potentially be impacted by the Proposed Development. This includes a summary of baseline data, an evaluation of the potential construction, operational and decommissioning phase impacts, and outlines the proposed scope of work and assessment methodology to assess the potential impacts on these receptors.

20.1.2 The EIA Scoping Area is illustrated on Figure 1-1. This chapter should be read in conjunction with the following chapters of the Scoping Report:

- Chapter 2 The Proposed Development.
- Chapter 3 EIA Methodology.
- Chapter 9 Water Environment.
- Chapter 10 Landscape and Visual.
- Chapter 11 Terrestrial Historic Environment.
- Chapter 13 Traffic and Access.
- Chapter 16 Climate Change.
- Chapter 17 Socio-economics.
- Chapter 19 Ground Conditions.

20.1.3 The lead assessor is a Chartered Soil Scientist with over 20 years' experience, including the delivery of agricultural land and soils assessments under the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 in support of Nationally Significant Infrastructure Projects ('NSIPs'), including water resources infrastructure.

### 20.2 Study Area

20.2.1 The study area used to establish baseline conditions and identify potential impacts for this chapter is the EIA Scoping Area. Where relevant, the study

area has been broken down into the following sections of the EIA Scoping Area based on the following components of the Proposed Development (refer to Figure 1-3):

- Proposed Advanced Water Recycling Plant ('AWRP').
- Proposed Long Sea Outfall ('LSO').
- Proposed Central Service Reservoir ('CSR').
- Proposed Western Service Reservoir ('WSR').
- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
- Proposed CSR to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

20.2.2 Within the agricultural land and soils chapter of the ES, the study area will be refined for each receptor to reflect the nature of the potential effect being assessed, as follows:

- For soils supporting agricultural production, soils supporting ecological habitats, and soil carbon, the study area will be the proposed Order Limits.
- For agricultural land use, the study area will extend to include any land within a farm business or agricultural holding wider agricultural landholding that could be directly impacted by the construction, operational or decommissioning phases of the Proposed Development.

20.2.3 Appendix 20.1 to this chapter sets out the relevant legislation, policy and guidance for the agricultural land and soils chapter of the ES. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

## 20.3 Consultation and Engagement

20.3.1 A virtual Environmental Stakeholder Forum meeting was held on 26 February 2026, during which the proposed approach to the agricultural land and soils assessment was presented to Natural England ('NE') and other

environmental stakeholders. Following the meeting, NE requested that additional details be provided on the proposed methodology for the Agricultural Land Classification ('ALC') assessment. In response, an outline ALC survey methodology was prepared and issued for review and discussion with NE, as required. No specific comments were provided in Natural England's feedback that necessitated changes to the proposed scope of the agricultural land and soils assessment presented within this chapter.

- 20.3.2 Further engagement will be held with NE as the statutory consultee on soils, as required.

## 20.4 Baseline Environment

- 20.4.1 Agricultural land and soils receptors are considered for the purposes of this scoping exercise to comprise:

- Soils supporting agriculture: Soils whose primary function is to support agricultural production, including crop growth and livestock farming, and whose quality is principally reflected through the ALC system.
- Soils supporting ecological habitats: Soils that support habitats and ecological features of conservation value, including designated sites, ancient woodland and priority habitats.
- Soil carbon: Carbon stored within soils, including mineral soils, peaty soils and peat soils, which contributes to climate regulation and wider ecosystem functions.
- Agricultural land use: The use of land for agricultural purposes, including farming enterprises, field management, access arrangements and the operation of agricultural holdings.

- 20.4.2 The data sources set out below have been used to gather the baseline information on agriculture and soils:

- Post-1988 ALC data - Multi-Agency Geographic Information for the Countryside ('MAGIC') Online Viewer [1].
- Predictive ALC grade - Cranfield University's LandIS Portal [2].
- Soil type classification – Cranfield University's Soilscales - LandIS Soilscales Viewer [3].
- Superficial deposits - British Geological Survey geindex [4].
- Peat maps - England Peat Map [5].

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## Soils Supporting Agriculture

- 20.4.3 The value of soils for agricultural production is primarily evaluated by ALC grade. Best and most versatile ('BMV') agricultural land equates to grades 1, 2 and sub-grade 3a of the ALC system.
- 20.4.4 Post-1988 ALC data are available in isolated parts of the study area, with ALC grades 2, 3a, 3b, 4 and other land mapped [6]. This predictive ALC mapping shows the study area to comprise grades 1, 2, 3a, 3b and 4, as well as non-agricultural and 'urban' land [7]. However, it only provides an indication of the likely ALC grade such that site-specific surveys will be needed to confirm ALC grades within the study area where existing post-1988 data are not available. The ALC mapping is shown on Figure 20-2, showing Post-1988 ALC data where available and predictive ALC data.
- 20.4.5 Further details for the components of the Proposed Development and their associated sections of the study area are provided below. Post-1988 ALC data are referenced, where available.

## Soils Supporting Ecological Habitats

- 20.4.6 The role of soils in supporting ecological receptors within the study area has been considered. This has included soils that support designated nature conservation sites, ancient woodland and Priority Habitats, and where the condition and function of the soil contribute to the maintenance of ecological features of recognised value.
- 20.4.7 The presence of these receptors has been identified using publicly available spatial datasets and mapping, including designated site boundaries and habitat classifications.
- 20.4.8 The following sections describe the baseline conditions for soils supporting ecological receptors across the different sections of the study area.

## Soil Carbon

- 20.4.9 Soil carbon has been evaluated as a receptor due to the presence of peaty soils and mineral soils across the study area, as indicated on Figure 20-1.

The available baseline datasets do not reliably distinguish organic mineral soils at the resolution required for assessment. The presence and distribution of organic-mineral soils will be further investigated through the ALC and Soil Resource Survey ('SRS') to be undertaken and, where identified, will be reported within the ES.

### Agricultural Land Use

- 20.4.10 Agricultural land use within the study area is predominantly characterised by arable and mixed farming, reflecting the wider agricultural landscape across Suffolk and Norfolk. Land is primarily used for the cultivation of cereal and root crops, alongside areas of improved grassland supporting livestock grazing.
- 20.4.11 Detailed information on individual agricultural holdings, farm management practices and land ownership is not available at this scoping stage. Agricultural holdings within the study area are therefore assumed to be of varying size and configuration, with field patterns largely defined by historic land division and drainage infrastructure. Farm access is typically provided via a network of local roads and farm tracks, and land parcels may be interconnected or separated by features such as roads, watercourses and field boundaries. Where available, information gathered through landowner engagement and other project consultation and engagement activities will be used to refine the baseline and inform the assessment presented within the ES.

### Proposed AWRP

#### Soils Supporting Agriculture

- 20.4.12 The post-1988 ALC data shows the proposed AWRP section of the study area to have grade 2 and subgrade 3a soils. The predictive ALC mapping shows grade subgrade 3a.

#### Soils Supporting Ecological Habitats

- 20.4.13 The proposed AWRP section of the study area does not intersect with any designated sites or identified habitats of ecological importance.



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### Soil Carbon

- 20.4.14 Soils within the proposed AWRP section of the study area are predominantly mineral soils, comprising well-drained loamy textures. No peaty soils are mapped within this section of the study area.

### Proposed LSO

#### Soils Supporting Agriculture

- 20.4.15 The terrestrial area of the proposed LSO section of the study area is predominantly predicted to be subgrade 3a land with a very minor proportion of grade 5 land (located within the extent of the section containing North Beach) and a small proportion of land (located within Corton and Hopton-on-Sea) within the 'urban' ALC grade according to predictive ALC mapping.

#### Soils Supporting Ecological Habitats

- 20.4.16 The proposed LSO section of the study area intersects with the Southern North Sea Special Area of Conservation ('SAC'). However, this designation relates to marine habitats and species and is not considered a soil receptor for the purposes of this assessment.
- 20.4.17 The terrestrial elements of the proposed LSO section of the study area do not intersect with any designated sites or identified habitats of ecological importance.

### Soil Carbon

- 20.4.18 Soils within the proposed LSO section of the study area are predominantly mineral soils, comprising a mix of well-drained coarse loamy soils and slowly permeable clayey soils, which are seasonally waterlogged in places. No peaty soils are mapped within this section of the study area.

### Proposed CSR

#### Soils Supporting Agriculture

- 20.4.19 The proposed CSR section of the study area is located almost entirely on predicted subgrade 3b land, with a very minor proportion within the 'urban'

ALC grade (south of Threadbare Hall Farm). Areas that comprise subgrade 3b and 'urban' land are not BMV.

### Soils Supporting Ecological Habitats

20.4.20 The proposed CSR section of the study area does not intersect with any designated sites or identified habitats of ecological importance.

### Soil Carbon

20.4.21 Soils within the proposed CSR section of the study area are predominantly mineral soils, comprising slowly permeable clayey and fine loamy soils, which are seasonally waterlogged in places, together with calcareous clayey soils. No peaty soils are mapped within this section of the study area.

## Proposed WSR

### Soils Supporting Agriculture

20.4.22 The proposed WSR section of the study area is located almost equally on predicted grade 2 (in the centre of the study area) and subgrade 3a (in the south of the study area) land.

### Soils Supporting Ecological Habitats

20.4.23 The proposed WSR section of the study area does not intersect with any designated sites or identified habitats of ecological importance.

### Soil Carbon

20.4.24 Soils within this the proposed WSR section of the study area are predominantly mineral soils, comprising deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging, together with more slowly permeable, seasonally waterlogged loamy soils over clay. No peaty soils are mapped within this section of the study area.

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## Proposed AWRP to River Waveney Pipeline

### Soils Supporting Agriculture

- 20.4.25 The proposed AWRP to River Waveney Pipeline section of the study area is predominantly located on subgrade 3a land, with some areas of grade 2 (in the southwest of the study area) and subgrade 3b (in the southern part of the study area) land and small areas of grade 4 land, based on the predictive mapping.

### Soils Supporting Ecological Habitats

- 20.4.26 The proposed AWRP to River Waveney Pipeline section of the study area intersects with a number of priority habitats. These include areas of grazing marsh, reedbed, purple moor grass and rush pasture, as well as areas of broadleaved and mixed woodland and lowland dry acid grassland.

### Soil Carbon

- 20.4.27 Soils within the proposed AWRP to River Waveney Pipeline section of the study area are predominantly mineral soils, comprising a mix of loamy and clayey soil types with variable drainage characteristics, including both well-drained and seasonally waterlogged soils.
- 20.4.28 Peat soils are present locally in two areas: east of Ellingham, where the study area intersects approximately 500m of peatland, and south of Somerleyton, where the section of the study area crosses an area of peaty soils extending over approximately 2km within the floodplain of the River Waveney.

## Proposed Barsham WTW to CSR Pipeline

### Soils Supporting Agriculture

- 20.4.29 The predominant predicted ALC grade in the proposed Barsham WTW to CSR Pipeline section of the study area is subgrade 3a, with minor areas of grade 2 (mostly in the southern part of the study area), subgrade 3b (mostly in the south of the study area) and non-agricultural land (small areas throughout the study area).

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### Soils Supporting Ecological Habitats

- 20.4.30 The proposed Barsham WTW to CSR Pipeline section of the study area does not intersect with any designated sites or identified habitats of ecological importance.

### Soil Carbon

- 20.4.31 Soils within the proposed Barsham WTW to CSR Pipeline section of the study area are predominantly mineral soils, comprising slowly permeable clayey and loamy soils, many of which are seasonally waterlogged, together with areas of better-drained sandy soils.
- 20.4.32 Whilst NE's England Peat Map does not identify peat soils within this section of the study area, localised areas of peat soils are indicated by the National Soil Map data [8], associated with clayey over sandy substrates. These soils are therefore considered to comprise predominantly mineral soils with localised peat soils.

### Proposed CSR to WSR Pipeline

#### Soils Supporting Agriculture

- 20.4.33 The proposed CSR to WSR Pipeline section of the study area is located on land with predicted grade 2 (mostly in the eastern and western part of the study area), subgrades 3a and 3b (mostly in the eastern end of the study area). Subgrade 3a land is the predominant predicted ALC grade within this section.

#### Soils Supporting Ecological Habitats

- 20.4.34 The proposed CSR to WSR Pipeline section of the study area intersects predominantly with agricultural land and managed soils, with limited evidence of soils supporting habitats of ecological importance along most of the route.
- 20.4.35 No designated sites or semi-natural habitats of ecological importance have been identified.

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### Soil Carbon

- 20.4.36 Soils within the proposed CSR to WSR Pipeline section of the study area are predominantly mineral soils, comprising slowly permeable clayey and loamy soils, many of which are seasonally waterlogged, together with areas of better-drained loamy soils.
- 20.4.37 Peaty soils are present locally in two areas in this section of the study area, to the north and south of Eye, associated with crossings of the River Dove. These soils are primarily mineral in nature but include localised areas of peat or underlying peat deposits.

### Proposed CSR to Saxmundham Pipeline

#### Soils Supporting Agriculture

- 20.4.38 The proposed CSR to Saxmundham Pipeline section of the study area is located on land with predicted grade 2 (the northern and southern parts of the study area), subgrade 3a (the northern part of the study area) and subgrade 3b, along with minor proportions of 'urban' grade land (around Saxmundham). The predominant predicted ALC grade for land within this section is subgrade 3b.

#### Soils Supporting Ecological Habitats

- 20.4.39 The proposed CSR to Saxmundham Pipeline section of the study area does not intersect with any designated sites or identified habitats of ecological importance.

### Soil Carbon

- 20.4.40 Soils within the proposed CSR to Saxmundham Pipeline section of the study area are predominantly mineral soils, comprising slowly permeable calcareous clayey soils and slowly permeable clayey and fine loamy soils, which are seasonally waterlogged in places.
- 20.4.41 Peaty soils are present locally in this section of the study area, along with a limited area of this section of the study area (extending to approximately

70m) near the A1120 and Abbey Wood. These occur within an otherwise predominantly mineral soil environment in this section of the study area.

## **Proposed Saxmundham to SZC Pipeline**

### **Soils Supporting Agriculture**

20.4.42 The proposed Saxmundham to SZC Pipeline section of the study area is located on land with predicted grade 2 (the western part of the study area), subgrade 3a (the central part of the study area), subgrade 3b, as well as 'Non-agricultural land' (around Sizewell). The predominant predicted ALC grade for land within this section is subgrade 3b.

### **Soils Supporting Ecological Habitats**

20.4.43 The proposed Saxmundham to SZC Pipeline section of the study area does not intersect with any designated sites or identified habitats of ecological importance.

### **Soil Carbon**

20.4.44 Soils within the proposed Saxmundham to SZC Pipeline section of the study area are predominantly mineral soils, comprising slowly permeable clayey and loamy soils, many of which are seasonally waterlogged, together with areas of well-drained sandy soils.

20.4.45 Peat soils are present locally within a limited area of this section of the study area (extending to approximately 50m) around Hilton Covert and Dunwich Forest. This section of the study area therefore comprises predominantly mineral soils with a very limited area of peat soils.

## **Proposed Eastern Distribution Mains**

### **Soils supporting agriculture**

20.4.46 The proposed Eastern Distribution Mains section of the study area comprises predominantly subgrade 3a, grade 2, and 'urban' grade in order of area. Grade 2 land occurs in the northern part of the study area, subgrade 3a occurs in the central and southern parts of the study area,

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whilst 'urban' grade land occurs on the eastern and western parts of the boundary of this section of the study area.

### **Soil supporting Ecological Habitats**

- 20.4.47 The proposed Eastern Distribution Mains section of the study area intersects some Priority Habitats, comprising Good Quality Semi Improved Grassland and Deciduous Woodland.

### **Soils Supporting Soil Carbon**

- 20.4.48 The soils are predominately mineral soils comprising slowly permeable seasonally waterlogged fine loamy over clayey soils, with some of the soils being described as deep fine loam with slight seasonal waterlogging. There is no peat within this section of the study area.

## **Proposed Western Distribution Mains**

### **Soils Supporting Agriculture**

- 20.4.49 The soils in proposed Western Distribution Mains section of the study area are predominantly grade 2 soils, with a minor proportion of subgrade 3a soils in the northern and central parts of the study area. 'Urban' grade land occurs in the central part of this section of the study area.

### **Soil supporting Ecological Habitats**

- 20.4.50 The proposed Western Distribution Mains section of the study area does not interact with any designated sites or identified habitats of ecological importance.

### **Soils Supporting Soil Carbon**

- 20.4.51 The soils are predominantly mineral soils comprising fine loamy over clayey soils with slowly permeable subsoils and slight seasonally waterlogging. No peat is mapped within this section of the study area.

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## 20.5 Likely Significant Effects

- 20.5.1 The following potential impacts have been identified as having the potential to give rise to likely significant effects and have therefore been proposed to be scoped into the ES for further assessment.

### Construction Phase

- 20.5.2 During the construction phase, soil handling, trafficking and other construction activities have the potential to affect soils supporting agriculture through degradation of soil functions. An assessment of these effects is proposed to be scoped into the ES as soil quality and agricultural productivity could be adversely affected if soils are not managed appropriately.
- 20.5.3 Temporary land take associated with pipeline installation and permanent land take associated with above-ground infrastructure also have the potential to result in the loss of soil function within soils supporting agriculture. An assessment of these effects is proposed to be scoped into the ES as construction activities would impact on soils supporting agriculture.
- 20.5.4 Soil handling, trafficking and other construction activities have the potential to affect soils supporting ecological habitats through degradation of soil functions. An assessment of these effects is proposed to be scoped into the ES because construction activities could affect soils supporting habitats of very high value locally if not managed appropriately.
- 20.5.5 Soil handling, trafficking and other construction activities also have the potential to affect soil carbon through degradation of soil functions. An assessment of these effects is proposed to be scoped into the ES because peat and peaty soils are present along sections of the route and represent very high to high sensitivity receptors for soil carbon.
- 20.5.6 Construction activities associated with temporary land take for pipeline installation have the potential to disrupt agricultural activities and operations. An assessment of these effects is proposed to be scoped into



the ES because construction activities will temporarily affect agricultural land use across the pipeline components of the Proposed Development.

20.5.7 Above-ground infrastructure development has the potential to result in the permanent loss or change of agricultural land use. An assessment of these effects is proposed to be scoped into the ES because permanent land take will occur at discrete infrastructure locations associated with the proposed AWRP, CSR and WSR components of the Proposed Development.

20.5.8 Construction access and haul routes also have the potential to cause severance and disruption to farm access and operations. An assessment of these effects is proposed to be scoped into the ES because construction activities may disrupt access to, and the operation of, farm holdings during the construction phase of the Proposed Development.

### Decommissioning Phase

20.5.9 During the decommissioning phase of the Proposed Development, infrastructure is anticipated to either be left in situ or involve the removal of above-ground infrastructure components (including the proposed AWRP, CSR and WSR). The below-ground infrastructure including pipeline components (and their associated above ground fittings such as air valves and wash out valves) are anticipated to be left in situ but could potentially be removed.

20.5.10 The ES will assess the maximum parameters and ‘*cautious ‘worst case’’* in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s Nationally Significant Infrastructure Projects (‘NSIPs’): Pre-Application Advice on Environmental Impact Assessment (July 2026) [9] with reference to basing assessments on a ‘*cautious ‘worst case’ approach*’.

20.5.11 At this scoping stage, an assessment of likely significant decommissioning effects is proposed to be scoped into the ES, on the assumption that removal of infrastructure may be required. However, if the approach to decommissioning for the Proposed Development is confirmed to comprise

infrastructure remaining in situ at a later stage of the EIA process, an assessment of the effects of the removal of the relevant components may subsequently be scoped out of the ES.

- 20.5.12 The removal of the Proposed Development's pipeline components in the decommissioning phase will likely result in soil handling, trafficking and other construction activities during pipeline removal which have the potential to affect soils supporting agriculture. Therefore, an assessment of these effects is proposed to be scoped into the ES as soil quality and agricultural productivity could be adversely affected if soils are not managed appropriately.
- 20.5.13 Temporary land take associated with pipeline removal has the potential to result in the loss of soil function within soils supporting agriculture. Therefore, an assessment of these effects is proposed to be scoped into the ES as construction activities would impact on soils supporting agriculture.
- 20.5.14 Soil handling, trafficking and other construction activities during pipeline removal also have the potential to affect soils supporting ecological habitats through degradation of soil functions during the decommissioning phase. An assessment of these effects is proposed to be scoped into the ES because construction activities could affect soils supporting habitats of very high value locally if not managed appropriately.
- 20.5.15 Soil handling, trafficking and other construction activities caused by pipeline removal have the potential to affect soil carbon through degradation of soil functions. An assessment of these effects is proposed to be scoped into the ES because peat and peaty soils are present along sections of the study area and represent very high to high sensitivity receptors for soil carbon.
- 20.5.16 Decommissioning activities associated with temporary land take for pipeline removal has the potential to disrupt agricultural activities and operations. An assessment of these effects is proposed to be scoped into the ES because

construction will temporarily affect agricultural land use across the pipeline components of the Proposed Development.

- 20.5.17 Decommissioning access and haul routes associated with pipeline removal have the potential to cause severance and disruption to farm access and operations. An assessment of these effects is proposed to be scoped into the ES because construction activities may disrupt access to and operation of farm holdings during the decommissioning phase.

## 20.6 Impacts Scoped out of the Assessment

- 20.6.1 The following potential impacts have been considered and are proposed to be scoped out of the assessment in the ES because no likely significant effects are anticipated. This reflects the nature of the Proposed Development, embedded mitigation and the expected absence of ongoing disturbance following construction and reinstatement.

### Operational Phase

- 20.6.2 During the operational phase, the presence of the Proposed Development's buried pipeline components (and their above ground fittings such as air valves and wash out valves) and above-ground infrastructure (the proposed AWRP, CSR and WSR) is not anticipated to have a discernible impact on soil structure or agricultural function. An assessment of these effects is therefore proposed to be scoped out of the ES as the pipeline components will be buried and soils reinstated during the construction phase, with no ongoing disturbance to soil function anticipated, including in respect of these components above ground fittings. The above-ground infrastructure components (the proposed AWRP, CSR and WSR) will result in permanent land take during the Proposed Development's construction phase, but there will be no ongoing impact on soils during its operational phase.
- 20.6.3 The effects associated with permanent land take for the proposed AWRP, CSR and WSR arise during construction and will therefore be assessed within the construction phase assessment in the ES. No additional permanent land take would occur during the Proposed Development's

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- operational or decommissioning phases and no ongoing impacts to surrounding soils are anticipated.
- 20.6.4 Operation and maintenance activities may result in localised disturbance to soils supporting agriculture during occasional maintenance works. However, an assessment of these effects is proposed to be scoped out of the ES as maintenance activities are expected to be infrequent, temporary and highly localised.
- 20.6.5 The operation of the Proposed Development is not expected to result in ongoing disturbance to soils supporting ecological receptors for both the above and below-ground components. An assessment of this effect is therefore proposed to be scoped out of the ES, as no routine operational activities are anticipated to affect soils supporting habitats following construction and reinstatement.
- 20.6.6 The presence of buried infrastructure within peaty soils is not expected to result in any ongoing loss of soil carbon during the Proposed Development's operational phase. An assessment of this effect is therefore proposed to be scoped out of the ES as any disturbance to carbon stores would occur during the construction phase, with no additional impacts anticipated during operation.
- 20.6.7 Agricultural land subject to temporary disturbance during construction is expected to be reinstated and returned to its baseline agricultural use. Consequently, an assessment of effects associated with continued land use following reinstatement is proposed to be scoped out of the ES.
- 20.6.8 Operational access for maintenance activities may result in temporary disruption to agricultural land use. However, an assessment of this effect is proposed to be scoped out of the ES as maintenance access is expected to be infrequent and temporary, with a negligible impact on overall land use.
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## 20.7 Proposed Approach to Mitigation

### Primary (Inherent) Mitigation

20.7.1 These primary measures are embedded within the design of the Proposed Development and will be refined as the design progresses:

- A design approach that seeks to reduce the extent of permanent and temporary land take, for agricultural land, peat/peaty soils and ecological habitats as far as practicable.
- The use of trenchless installation techniques (e.g. Horizontal Directional Drilling ('HDD')) at selected locations, where appropriate, to reduce disturbance to sensitive soils, peat resources, watercourses and habitats.

### Secondary (Foreseeable) Mitigation

20.7.2 These are additional, project specific measures that are reasonably foreseeable but cannot be finalised until later in the design process:

- Measures to avoid or reduce disruption to ongoing agricultural and forestry operations during construction, to be defined in more detail as the design of the Proposed Development evolves.

### Tertiary (Inexorable) Mitigation

20.7.3 These measures are those that will inevitably be implemented because they are standard practice or requirements to comply with legislation and regulation:

- Implementation of a Code of Construction Practice ('CoCP') for the Proposed Development, which will set out mandatory construction management measures relating to the soil protection, land management, access arrangements and protection of agricultural interests.
- Implementation of mitigation measures set out in a Soil Management Plan ('SMP') in accordance with the Outline Soil Management Plan ('OSMP') submitted in support of the DCO application.
- Implementation of measures relevant to soil protection set out within the Construction Environmental Management Plan ('CEMP') in accordance with the Outline Construction Environmental Management Plan ('OCEMP').
- Adoption of industry good practice for the conservation, handling, temporary storage and reinstatement of soil resources, including the segregation of soil horizons and reinstatement of soils to their original locations and profiles where practicable.

- Compliance with relevant legal and regulatory requirements governing soil conservation, pollution prevention and site management.
- Implementation of measures relevant to soil protection set out within the Decommissioning Environmental Management Plan ('DEMP') in accordance with the Outline Decommissioning Environmental Management Plan ('ODEMP') where decommissioning activities are required.

## 20.8 Proposed Approach to the ES

### Best Practice Guidance

- 20.8.1 The agricultural land and soils assessment will be informed by relevant industry best practice guidance relating to the assessment of soils, agricultural land and soil health within Environmental Impact Assessment ('EIA').
- 20.8.2 The primary source of best practice guidance is the Institute of Sustainability and Environmental Professionals' ('ISEP') (formerly the Institute of Environmental Management Assessment ('IEMA')) A New Perspective on Land and Soil in Environmental Impact Assessment (2022) [10] guidance (the 'ISEP Guidance'). This guidance provides a framework for the identification of soil receptors, assessment of soil functions, determination of receptor sensitivity and impact magnitude, and evaluation of likely significant effects on land and soils within the EIA process. The assessment methodology presented in this chapter has been developed with reference to this guidance.
- 20.8.3 Consideration will also be given to the ISEP Advice Note Soil Health and Environmental Assessment (2025) [11]. This document promotes the proportionate consideration of soil health within environmental assessment and provides guidance on the use of soil health indicators, soil functions and ecosystem services. The findings of the ALC and SRS will be used to determine whether additional soil health indicators should be included within the ES.

## Assessment Methodology

- 20.8.4 The assessment methodology has been developed using ISEP Guidance and National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 109 - Geology and Soils (2019) [12]. Whilst this guidance was published to inform the assessment of highways schemes, it is a widely adopted methodology for assessing impacts on agricultural land and soils for other types of projects, including of the scale, size and nature of the Proposed Development. It is considered to comprise best practice guidance for the assessment of likely significant effects on agricultural land and soils from the Proposed Development.
- 20.8.5 With regard to agricultural land use, the assessment will consider land-take and change of use, severance, accessibility and loss of farm infrastructure (e.g. access tracks, drainage systems, irrigation infrastructure or other features supporting agricultural land use). It will also consider whether this would affect the viability of the existing land use. The economic impacts on agricultural land use will be considered within the socio-economics chapter of the ES.
- 20.8.6 The resilience of soils to structural damage during handling varies based on interactions between soil texture, moisture, structure and climate. This is important to recognise when determining the sensitivity of soil receptors. Table 20-1 sets out the criteria that will be followed to define resilience.

Table 20-1: Resilience of Soil Receptors

| Resilience | Description                                                                                                                                                                                                                                                                                                                                                                                           |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low        | Soils with high clay and silt fractions (clays, silty clays, sandy clays, heavy silty clay loams and heavy clay loams) and organo-mineral and peaty soils where the Field Capacity Days ('FCDs') are 150 or greater. Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where the FCDs are 225 or greater. All soils in wetness class (WCV or WCVI). |
| Medium     | Clays, silty clays, sandy clays, heavy silty clay loams, heavy clay loams, silty loams and organo-mineral and peaty soils where the FCDs are fewer than 150. Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where                                                                                                                                |

| Resilience | Description                                                                                                                                                           |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | FCDs are fewer than 225. Sands, loamy sands, sandy loams and sandy silt loams where the FCDs are 225 or greater or are in wetness classes WCIII and WCIV.             |
| High       | Soils with a high sand fraction (sands, loamy sands, sandy loams and sandy silt loams) where FCD are fewer than 225 and are in WCI (rarely wet) or WCII (seldom wet). |

## Sensitivity of Receptors

20.8.7 The value/sensitivity of agriculture and soils receptors for the assessment in the agricultural land and soils chapter of the ES will be determined by the criteria set out in Table 20-2. For soil receptors, the resilience of the soils to structural damage during handling (as explained in paragraph 20.8.6) will also be considered.

Table 20-2: Sensitivity Criteria for Agriculture and Soils Receptors (amended from the ISEP Guidance, Table 2)

| Value/Sensitivity | Sensitive Receptor                   | Description                                                                                                                                                                                                                                                   |
|-------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very high         | Soils supporting agriculture         | BMV soils/land - ALC grades 1 and 2.                                                                                                                                                                                                                          |
|                   | Soils supporting ecological habitats | Soils supporting protected features in international sites (e.g. SACs, Special Protection Areas ('SPAs'), Ramsar sites), or ancient woodland.                                                                                                                 |
|                   | Soil carbon                          | Peat soils - soils with a soil organic matter content greater than 50%.                                                                                                                                                                                       |
|                   | Agriculture environmental standards  | Land managed organically.                                                                                                                                                                                                                                     |
|                   | Agricultural land use                | Areas of land in which the enterprise is wholly reliant/fully dependent on the spatial relationship of land to key agricultural infrastructure (e.g. intensive livestock production such as dairy cattle or irrigated cropping and field-scale horticulture). |
| High              | Soils supporting agriculture         | BMV soils/land - ALC subgrade 3a.                                                                                                                                                                                                                             |



| Value/Sensitivity | Sensitive Receptor                   | Description                                                                                                                                                                                                                                                                                                                         |
|-------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Soils supporting ecological habitats | Soils supporting protected features in UK designated sites (e.g. Site of Special Scientific Interest ('SSSI') or National Nature Reserve ('NNR')).                                                                                                                                                                                  |
|                   | Soil carbon                          | Peaty soils - soils with a soil organic matter content greater than 20-25% (variable depending on clay content).                                                                                                                                                                                                                    |
|                   | Agriculture environmental standards  | Land managed in accordance with higher-level stewardship scheme or higher-tier countryside stewardship scheme land management agreements.                                                                                                                                                                                           |
|                   | Agricultural land use                | Areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure (e.g. intensive livestock production such as dairy cattle or field-scale horticulture).                                                                                                                   |
| Medium            | Soils supporting agriculture         | ALC subgrade 3b soils/land.                                                                                                                                                                                                                                                                                                         |
|                   | Soils supporting ecological habitats | Soils supporting non-statutory designated sites (e.g. Local Nature Reserves ('LNRs'), Sites of Nature Conservation Interest ('SNCIs')).                                                                                                                                                                                             |
|                   | Soil carbon                          | Organic mineral soils.                                                                                                                                                                                                                                                                                                              |
|                   | Agriculture environmental standards  | Land managed in accordance with entry-level stewardship or mid-tier countryside stewardship scheme land management agreements.                                                                                                                                                                                                      |
|                   | Agricultural land use                | Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure (e.g. combinable cropping and grazing livestock, other than dairying); and<br>Access between land and key agricultural infrastructure is required on a reasonably frequent basis (e.g. weekly). |
| Low               | Soils supporting agriculture         | ALC grades 4 and 5 soils/land.                                                                                                                                                                                                                                                                                                      |

| Value/Sensitivity | Sensitive Receptor                   | Description                                                                                                                                                                                                                                                                             |
|-------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Soils supporting ecological habitats | Soils in non-designated notable habitats or priority habitats.                                                                                                                                                                                                                          |
|                   | Soil carbon                          | Mineral soils.                                                                                                                                                                                                                                                                          |
|                   | Agriculture environmental standards  | Land maintained in accordance with former cross-compliance standards including Good Agricultural and Environmental Conditions ('GAEC') and Statutory Management Requirements, which ended in 2023, but whose soil and environmental requirements continue under current UK regulations. |
|                   | Agricultural land use                | Areas of land in which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure.                                                                                                                                                          |
| Very low          | Soils supporting agriculture         | Soils outside agricultural land (non-agricultural or urban).                                                                                                                                                                                                                            |
|                   | Soils supporting ecological habitats | Soils outside any of the habitats identified above.                                                                                                                                                                                                                                     |
|                   | Soil carbon                          | No very low sensitivity category defined. All soil carbon receptors are captured within the very high to low sensitivity categories above.                                                                                                                                              |
|                   | Agriculture environmental standards  | No very low sensitivity category defined. Agricultural land not managed under recognised agricultural or environmental standards would not constitute a receptor within this category.                                                                                                  |
|                   | Agricultural land use                | Areas of land which are infrequently used on a non-commercial basis.                                                                                                                                                                                                                    |

## Impact Magnitude

- 20.8.8 The magnitude of an impact for the agriculture and soils assessment will be determined by the criteria set out in Table 20-3.
- 20.8.9 Agricultural land-take is considered both at a regional level and on a holding-specific basis.

20.8.10 Professional judgement may be used in certain cases to modify the magnitude of change. This would take into account the spatial and temporal extent of effect e.g. where only limited volumes of soils are affected, a magnitude of change may be reduced. Any such modifications will be explained and justified within the assessment of likely significant effects.

Table 20-3: Impact Magnitude Criteria for Agriculture and Soils Receptors (amended from the ISEP Guidance, Table 3)

| Magnitude of Impact | Sensitive Receptor        | Description                                                                                                                                                                                   |
|---------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Major               | Soils                     | Permanent, irreversible sealing or loss of one or more soil functions (including downgrading of ALC) over an area of more than 20 hectares ('ha').                                            |
|                     | Land-take                 | Permanent loss of >20'ha of agricultural land through sealing or land acquisition.                                                                                                            |
|                     | Severance                 | No access available to severed land.                                                                                                                                                          |
|                     | Infrastructure            | Permanent loss of building or other key agricultural infrastructure.                                                                                                                          |
|                     | Land management standards | Permanent impact on land management standards or agreements which compromises environmental objectives (e.g. soil conservation, water quality, habitat protection, biodiversity obligations). |
|                     | Agricultural land use     | High degree of disruption to cultivation patterns, high risk of change in land use.                                                                                                           |
| Moderate            | Soils                     | Permanent, irreversible sealing or loss of one or more soils functions (including downgrading of ALC) over an area between 5ha and 20ha.                                                      |
|                     | Land-take                 | Permanent loss of between 5ha and 20ha of agricultural land through sealing or land acquisition.                                                                                              |
|                     | Severance                 | Access available to severed land via public highway.                                                                                                                                          |
|                     | Infrastructure            | Temporary loss or disruption to use of key agricultural infrastructure that is integral to land use.                                                                                          |
|                     | Land management standards | Temporary impact on land management standards or agreements which compromises environmental objectives.                                                                                       |

| Magnitude of Impact | Sensitive Receptor        | Description                                                                                                                                                                                         |
|---------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Agricultural land use     | Moderate degree of disruption to cultivation patterns, moderate risk of change in land use, small changes to the woodland over a wide area or a noticeable change over a limited area.              |
| Minor               | Soils                     | Permanent, irreversible sealing or loss of one or more soil functions (including downgrading of ALC) over an area of less than 5ha, or a temporary, reversible loss of one or more soil functions.  |
|                     | Land-take                 | Permanent land-take of <5ha or temporary land-take.                                                                                                                                                 |
|                     | Severance                 | Access available to severed land via private way.                                                                                                                                                   |
|                     | Infrastructure            | Loss or disruption to use of agricultural infrastructure that is not material to land use.                                                                                                          |
|                     | Land management standards | Temporary impact on land management standards or agreements that do not compromise environmental objectives (e.g., soil conservation, water quality, habitat protection, biodiversity obligations). |
|                     | Agricultural land use     | Minimal degree of disruption to cultivation patterns, minimal risk of change in land use, very minor changes to the woodland over a wide area or minor changes over a limited area.                 |
| Negligible          | Soils                     | No discernible loss, reduction or improvement of soil functions that restrict or decrease restrictions to current or proposed land use.                                                             |
|                     | Land-take                 | Temporary land-take of <5ha.                                                                                                                                                                        |
|                     | Agricultural land use     | No discernible disruption to cultivation patterns or risk of change in land use, very minor changes to the woodland over a wide area or minor changes over a limited area.                          |

## Effect Significance

20.8.11 As set out in Table 20-4, the overall significance of effects on the identified sensitive receptors will be assessed using the magnitude of the impact compared against the sensitivity of the receptor to provide an overall significance of effect, ranging from negligible to major. Effects will be

classified according to their significance (negligible, minor, moderate or major) and their nature (adverse, neutral or beneficial).

Table 20-4: Effect Significance (adapted from the ISEP Guidance, Table 5)

|                     |            | Sensitivity of Receptor |                      |                      |                      |                      |
|---------------------|------------|-------------------------|----------------------|----------------------|----------------------|----------------------|
|                     |            | Very High               | High                 | Medium               | Low                  | Very Low             |
| Magnitude of Impact | Very High  | Major                   | Major                | Major/<br>Moderate   | Moderate             | Minor                |
|                     | High       | Major                   | Major                | Major/<br>Moderate   | Moderate/<br>Minor   | Minor/<br>Negligible |
|                     | Medium     | Major/<br>Moderate      | Major/<br>Moderate   | Moderate             | Minor                | Minor/<br>Negligible |
|                     | Low        | Moderate                | Moderate/<br>Minor   | Minor                | Minor/<br>Negligible | Negligible           |
|                     | Negligible | Minor                   | Minor/<br>Negligible | Minor/<br>Negligible | Negligible           | Negligible           |

20.8.12 The effect significance matrix is adapted from the ISEP Guidance, which provides illustrative examples intended to support professional judgement rather than prescribe a fixed methodology. The matrix has been modified to align an EIA best practice approach to significance terminology and to reflect the proportionate level of assessment appropriate at this scoping stage. These adaptations do not change the intent or application of the ISEP Guidance.

### Soil Health Considerations

20.8.13 In line with the ISEP Advice Note Soil Health and Environmental Assessment, soil health will be considered in the ES through the assessment of soil functions and, where appropriate, supplementary soil indicators. As soil biological and chemical properties cannot be reliably characterised without site-specific data, the selection of relevant soil health indicators will follow the desk-based review and will be refined during the ALC/SRS. The final scope of soil health assessment will be determined proportionately based on baseline findings and the characteristics of the soils within the study area.

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## Mitigation and Residual Effects

20.8.14 The agricultural land and soils chapter of the ES will assess effects both before and after the implementation of mitigation measures, distinguishing between primary, secondary and tertiary mitigation measures. Where secondary mitigation is required to reduce effects to acceptable levels, this will be identified and its effectiveness assessed. Residual effects (those remaining after all mitigation) will be clearly reported within the ES. Further details are provided in chapter 3 EIA methodology.

## 20.9 In-combination Effects

20.9.1 Agricultural soils have limited interacting effects because soils in-combination effects are considered in other chapters. For example, soil stripping could lead to dust generation which would interact with air quality and human health, but normal mitigation measures would make the effects of this negligible. Other in-combination effects could comprise soil erosion impacting watercourses, but standard mitigation measures would be implemented to prevent this from occurring.

20.9.2 Interactions with climate change has also been considered. While climate change may influence soil conditions over the longer term (e.g. increased rainfall intensity or prolonged dry periods), these processes operate over timescales extending beyond the construction and early operational phases of the Proposed Development. In addition, good practice soil handling, restoration and management measures would support soil resilience and are not expected to interact cumulatively with climate change effects in a manner that would result in significant in combination effects at this scoping stage.

20.9.3 As set out in chapter 3 EIA methodology, cumulative effects with other existing and, or approved development (inter-project effects), will be assessed within the cumulative effects assessment chapter the ES.

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## 20.10 Limitations and Assumptions

- 20.10.1 The available predictive ALC survey data, NE's England Peat Map and National Soil Map data only provide an indication of likely soil properties and sensitivities. They are derived from a combination of mapped and modelled data and therefore have an inherent level of uncertainty at the site-specific scale. Therefore, refinement via site-specific surveys such as an ALC and SRS will be carried out at a later stage and reported in the ES.
- 20.10.2 Changes to the hydrological regime of watercourses during operation of the Proposed Development have the potential to influence localised flood risk beyond the Proposed Development boundary. These matters will be assessed within the water environment chapter of the ES. The agricultural land and soils assessment will have regard to the findings of the water environment assessment; however, significant effects on agricultural land and soils receptors are not anticipated.

### Data Gathering

- 20.10.3 Baseline soil information for the ES will be obtained through an ALC survey and an SRS. These surveys will be undertaken concurrently in accordance with NE guidance [13] and the ISEP Guidance and will provide information needed to accurately assess potential impacts on soil functions.

## 20.11 Summary of Impacts and Effects

- 20.11.1 Table 20-5 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the agricultural land and soils chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 20-5: Summary of Agricultural Land and Soils Scope

| Receptor                             | Effects                                                           | Anticipated Magnitude      | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                 | Scoped in/Scoped out |
|--------------------------------------|-------------------------------------------------------------------|----------------------------|------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Construction Phase</b>            |                                                                   |                            |                                    |                                                |                                                                                                                                                                            |                      |
| Soils supporting agriculture         | Soil handling and trafficking.                                    | Low                        | Very Low to Very High              | Significant                                    | CoCP and good practice soil handling and reinstatement, measures set out in an SMP, in accordance with the OSMP. Measures set out in a CEMP, in accordance with the OCEMP. | Scoped in            |
| Soils supporting agriculture         | Temporary and permanent land-take.                                | Medium (localised)         | Very Low to Very High              | Significant                                    | Design minimisation and efficient land take, measures set out in an SMP, in accordance with the OSMP. Measures set out in a CEMP, in accordance with the OCEMP.            | Scoped in            |
| Soils supporting ecological habitats | Disturbance of soils supporting priority habitats (proposed AWRP) | Low (linear and temporary) | Low                                | Significant                                    | Route refinement, avoidance and appropriate reinstatement, measures set out in                                                                                             | Scoped in            |



| Receptor              | Effects                                                              | Anticipated Magnitude     | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                   | Scoped in/Scoped out |
|-----------------------|----------------------------------------------------------------------|---------------------------|------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                       | to River Waveney Pipeline section).                                  |                           |                                    |                                                | an SMP, in accordance with the OSMP. Measures set out in a CEMP, in accordance with the OCEMP.                                                                               |                      |
| Soil carbon           | Soil handling and trafficking.                                       | Low to Medium (localised) | Low to Very High                   | Significant                                    | Design minimisation and trenchless techniques (e.g. HDD), measures set out in an SMP, in accordance with the OSMP. Measures set out in a CEMP, in accordance with the OCEMP. | Scoped in            |
| Agricultural land use | Temporary disruption to agricultural activities and farm operations. | Low                       | Medium                             | Significant                                    | Access management and reinstatement, measures set out in an SMP, in accordance with the OSMP. Measures set out in a CEMP, in accordance with the OCEMP.                      | Scoped in            |

| Receptor                     | Effects                                                                                                                                                                   | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|----------------------------|----------------------|
| Agricultural land use        | Permanent loss or change of agricultural land use at above-ground infrastructure locations at the proposed AWRP, CSR and WSR components.                                  | Medium (localised)    | Medium                             | Significant                                    | Design optimisation        | Scoped in            |
| <b>Operational Phase</b>     |                                                                                                                                                                           |                       |                                    |                                                |                            |                      |
| Soils supporting agriculture | No ongoing disturbance to soil structure or function following the installation of the pipeline components and construction of the proposed AWRP, CSR and WSR components. | Negligible            | Very Low to Very High              | Not Significant                                | None required.             | Scoped out           |
| Soils supporting agriculture | No further permanent or temporary land                                                                                                                                    | None                  | None                               | Not Significant                                | None.                      | Scoped out           |

| Receptor                             | Effects                                                                                                             | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                          | Scoped in/Scoped out |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                                      | take during the operational phase.                                                                                  |                       |                                    |                                                |                                                                                                                                                     |                      |
| Soils supporting ecological habitats | No ongoing disturbance to soils supporting habitats.                                                                | Negligible            | Low to Very High                   | Not Significant                                | None required.                                                                                                                                      | Scoped out           |
| Soil carbon                          | No ongoing loss or disturbance of soil carbon.                                                                      | Negligible            | Low to Very High                   | Not Significant                                | None required.                                                                                                                                      | Scoped out           |
| Agricultural land use                | Return to baseline agricultural land use following reinstatement following installation of the pipeline components. | Negligible            | Medium                             | Not Significant                                | None required.                                                                                                                                      | Scoped out           |
| <b>Decommissioning Phase</b>         |                                                                                                                     |                       |                                    |                                                |                                                                                                                                                     |                      |
| Soil supporting agriculture          | Soil handling and trafficking.                                                                                      | Medium (localised)    | Very Low to Very High              | Significant                                    | CoCP and good practice soil handling and reinstatement, Measures set out in the SMP, in accordance with the OSMP and measures set out in a DEMP, in | Scoped in            |

| Receptor                             | Effects                                                                                              | Anticipated Magnitude      | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                          | Scoped in/Scoped out |
|--------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                                      |                                                                                                      |                            |                                    |                                                | accordance with the ODEMP.                                                                                                                                          |                      |
| Soils supporting agriculture         | Temporary land-take                                                                                  | Medium (localised)         | Very Low to Very High              | Significant                                    | Design minimisation and efficient land take. Measures set out in the SMP, in accordance with the OSMP and measures set out in a DEMP, in accordance with the ODEMP. | Scoped in            |
| Soils supporting ecological habitats | Disturbance of soils supporting priority habitats (Proposed AWRP to River Waveney Pipeline section). | Low (linear and temporary) | Low                                | Significant                                    | Avoidance and appropriate reinstatement. Measures set out in the SMP, in accordance with the OSMP and measures set out in a DEMP, in accordance with the ODEMP.     | Scoped in            |
| Soil carbon                          | Soil handling and trafficking.                                                                       | Low to Medium (localised)  | Low to Very High                   | Significant                                    | Design minimisation. Measures set out in the SMP, in accordance with the OSMP and measures set out in a DEMP, in                                                    | Scoped in            |

| Receptor              | Effects                                                              | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                  | Scoped in/Scoped out |
|-----------------------|----------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                       |                                                                      |                       |                                    |                                                | accordance with the ODEMP.                                                                                                                                  |                      |
| Agricultural land use | Temporary disruption to agricultural activities and farm operations. | Low                   | Medium                             | Significant                                    | Access management and reinstatement. Measures set out in the SMP, in accordance with the OSMP and measures set out in a DEMP, in accordance with the ODEMP. | Scoped in            |

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## 21 Materials and Waste

### 21.1 Introduction

21.1.1 This chapter describes the proposed approach which will be undertaken for the assessment of the likely significant effects resulting from the Suffolk Water Recycling, Transfer and Storage Project (the ‘Proposed Development’) on materials and waste [1]. The assessment will be presented within the Environmental Statement (‘ES’) submitted in support of the application for a Development Consent Order (‘DCO’). This chapter describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions, together with the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed.

21.1.2 The EIA Scoping Area is illustrated on Figure 1-1. This chapter should be read in conjunction with the following chapters of the Scoping Report:

- Chapter 2 The Proposed Development.
- Chapter 3 EIA Methodology.
- Chapter 9 Water Environment.
- Chapter 10 Landscape and Visual.
- Chapter 13 Traffic and Access.
- Chapter 15 Air Quality and Odour.
- Chapter 16 Climate Change.
- Chapter 17 Socio-economics.
- Chapter 18 Human Health.
- Chapter 19 Ground Conditions.
- Chapter 22 Major Accidents and Disasters.

21.1.3 The competent expert for this assessment is a Principal Environmental Consultant with a degree in Environmental Science. They are a Full Member of the Institution of Environmental Sciences (MIEnvSc). With over 23 years of professional experience, they have led materials and waste EIAs for major infrastructure and linear schemes, including water resources infrastructure projects.

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## 21.2 Study Area

- 21.2.1 In accordance with the Institute of Sustainability and Environmental Professionals' ('ISEP') (formerly the Institute of Environmental Management and Assessment ('IEMA')) Guide to Materials and Waste in Environmental Impact Assessment (2020) (the 'ISEP Guidance'), the assessment of materials and waste utilises the following spatial scope to assess the consumption of material resources, sterilisation of allocated mineral sites and the generation and disposal of waste:
- EIA Scoping Area – corresponding to the area where materials would be consumed, allocated mineral sites could be sterilised, and waste would be generated.
  - Expansive study area – extending to reflect the availability of construction materials and the capacity of waste management infrastructure, including remaining landfill void space.
- 21.2.2 The extent of the expansive study area depends on the types of materials required and the wastes to be generated. Where materials can be sourced and wastes managed locally or sub-regionally at a county level, the expansive study area will be commensurate to these spatial areas.
- 21.2.3 Additionally, the delineation of the expansive study area has been informed by likely materials sourcing and waste management, and the availability and spatial coverage of published baseline data and stakeholder information.
- 21.2.4 Where specialist materials or waste management is required, the expansive study area may extend to the regional or national level, and in limited cases internationally, consistent with supply chain characteristics and the ISEP Guidance.
- 21.2.5 For the purposes of the Proposed Development, the following expansive study areas have been defined:
- Materials availability: Sub-regional (Suffolk and Norfolk); regional (East of England); national (UK); and/or international.
  - Allocated mineral sites and other safeguarded mineral sites or areas: Sub-regional (Suffolk and Norfolk), together with relevant inshore marine safeguarding designations.

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- Waste disposal: Sub-regional (Suffolk and Norfolk) for inert and non-hazardous waste, and national (England) for hazardous waste.
- 21.2.6 Given the current limitations regarding materials provenance and waste management, as outlined in paragraphs 21.8.43 to 21.8.62, the desk-based assessment presented in Section 21.4 is based on professional judgment and the available baseline information.
- 21.2.7 The expansive study area will be more accurately defined at the ES stage of the EIA, when further details on the materials to be consumed and wastes to be managed become available.
- 21.2.8 Impacts arising from the consumption of material resources and the generation and disposal of waste, such as depletion of material resources and use of landfill void capacity, are generally dispersed rather than concentrated at specific receptor locations.
- 21.2.9 The baseline environment for this aspect therefore comprises the following key receptors:
- Materials availability: sub-regional availability (or, where justified, national or international availability) of key construction and operational materials within the expansive study area, including stocks, production and sales.
  - Mineral safeguarding sites: Presence of allocated mineral sites, Mineral Safeguarding Areas ('MSAs'), Mineral Consultation Areas ('MCAs') and relevant marine mineral safeguarding designations within or in proximity to the EIA Scoping Area.
  - Landfill void capacity: Sub-regional availability (or, where justified, national) of inert, non-hazardous and hazardous landfill void capacity within the expansive study area.
- 21.2.10 Appendix 21.1 sets out the relevant legislation, policy and guidance relevant to materials and waste. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.
- 21.2.11 A desk-based assessment has been undertaken to collect baseline data on materials availability, allocated mineral sites or areas, waste management infrastructure, waste disposal and remaining landfill void capacity. The
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assessment has been informed by the following sources, which represent the most recent and robust information available at the time of writing:

- British Geological Survey - UK Minerals Yearbook 2025 (2026) [2].
- British Plastics Federation - Annual Review 2024 (2024) [3].
- ChemAnalyst - Sodium Tripolyphosphate Market Analysis: Industry Size and Production, 2015–2035 (2025) [4].
- Crown Estate - Aggregates Site Agreements (England, Wales & Northern Ireland) (2026) [5].
- East of England Aggregate Working Party - Annual Report 2024 (2025) [6].
- Environment Agency ('EA') - 2024 Waste Data Interrogator (2025) [7].
- Forest Research - Forestry Statistics 2025 (2025) [8].
- Global Market Insights - Geotextiles Market Size by Material, Product and Application (2017) [9].
- Global Info Research - Global Sodium Dodecyl Sulfonate Market 2025 by Manufacturers, Regions, Type and Application, Forecast to 2031 (2025) [10].
- Global Info Research - Global Polyacrylamide Supply, Demand and Key Producers, 2024-2030 (2024) [11].
- Global Info Research - Global Sodium Bisulphite Supply, Demand and Key Producers, 2024-2030 (2024) [12].
- IMARC Group - Citric Acid Market Report by Application, Form and Region, 2025-2033 (2025) [13].
- IndexBox - Europe's Bentonite Market Forecast Shows Steady Growth with 2.8 percent CAGR in Value (2025) [14].
- IndexBox - United Kingdom Caustic Soda Market Overview 2024 and Forecast to 2035 (2025) [15].
- IndustryResearch.biz - Sodium Hypochlorite Market Size, Share, Growth, and Industry Analysis, Forecast to 2034 (2022) [16].
- Marine Management Organisation ('MMO') - Marine Plans Explorer (2024) [17].
- Mineral Products Association - Profile of the UK Mineral Products Industry 2025 Edition (2023) [18].
- Mordor Intelligence - Chelating Agents Market Size & Share Analysis - Growth Trends & Forecasts 2025-2030 (2025) [19].
- Mordor Intelligence - Hydrogen Peroxide Market Size and Share Analysis, 2019-2030 (2025) [20].
- Norfolk County Council - Norfolk Minerals and Waste Local Plan: Interactive Policies Map (2025) [21].

- Research Nester (2025) – Ferric Sulphate and Polyferric Sulphate Market Size and Share, 2025–2037 [22].
- Suffolk County Council (2025) – Suffolk Minerals & Waste Local Plan: Interactive Map of Minerals and Waste Locations of Interest [23].
- Statista (2025) – Chlorine global market volume, 2015–2030 [24].
- Statista (2025) – Sulfuric acid global market volume, 2015–2030 [25].
- UK Steel (2025) – Key Statistics Guide 2025 [26].

## 21.3 Consultation and Engagement

- 21.3.1 Engagement has been undertaken with the relevant Local Planning Authorities being those with planning responsibilities for the areas where waste will be generated, transported, managed or potentially affected by the proposed activities. These authorities are considered relevant because they have a direct interest in ensuring the proposal aligns with local planning policies and appropriately addresses any potential environmental and community impacts.
- 21.3.2 A virtual meeting was held with the following stakeholders on 11 March 2026 to discuss the proposed approach to the assessment of the Proposed Development's likely significant effects on materials and waste:
- Suffolk County Council ('SCC').
  - Norfolk County Council ('NCC').
  - East Suffolk Council ('ESC').
  - Mid Suffolk District Council ('MSDC').
  - South Norfolk District Council ('SNDC').
- 21.3.3 While no changes to the assessment scope or methodology were proposed by the consultees, relevant stakeholder comments received during the virtual meeting are summarised below:
- SCC requested that material requirements for haul roads are considered, including Type 1 aggregate imports, reuse, recycling and potential sharing between projects (such as the Proposed Development and other DCO projects). Haul road material requirements, including potential Type 1 aggregate imports and opportunities for reuse, recycling and sharing between projects (such as the Proposed Development and other DCO projects), will therefore be considered through the materials

and waste assessment in the ES. Links with related ES topics, including Climate Change, will also be considered where relevant.

- NCC noted that Norfolk is reliant on imports of crushed rock. The baseline will recognise relevant regional aggregate supply considerations, including Norfolk's reliance on imports of crushed rock, and this will be taken into account in the materials and waste assessment in the ES.
- NCC also noted that one route option crossed an allocated mineral site, which is now also subject to an application. The route option that previously crossed an allocated mineral site has been removed through optioneering and route refinement. The current EIA Scoping Area does not intersect with allocated or candidate mineral sites, and no permanent land take from allocated or candidate mineral sites is currently anticipated.
- NCC and SCC advised that further engagement is required in relation to Minerals Safeguarding Areas. Further engagement with the Mineral and Waste Planning Authorities ('MWPAs') will be undertaken to inform the approach to mineral safeguarding. This engagement will also inform whether a Mineral Resource Assessment ('MRA') is required and, if so, its scope.
- SNDC and BDC noted that two route options pass through historic landfill sites. A review of the EIA Scoping Area indicates that historic landfill sites remain within or close to parts of the EIA Scoping Area. Historic landfill constraints will be considered through design development and the Ground Conditions assessment. Any contaminated materials or waste arisings requiring off-site management will be considered, where relevant, in the construction-phase waste assessment in the ES.

21.3.4 Two additional virtual meetings were held with NCC and SCC to discuss the mineral safeguarding matters relating to the Proposed Development, with NCC on 7 July 2026 and SCC on 13 July 2026. The key comments and agreed actions from these meetings are summarised below:

- NCC advised that mineral resources along the pipeline route are relatively patchy and that the shallow pipeline works are unlikely to reach the main resource. NCC considered that any mineral sterilisation would therefore be limited in scale.
- NCC welcomed the avoidance of the permitted mineral site at Haddiscoe and confirmed that no additional mineral or waste constraints had been identified from the information available at the time of the meeting.
- NCC requested a proportionate, light-touch MRA. This should focus on permanent infrastructure (above and below ground) within MSAs, the scale of permanent works and excavation arisings, and opportunities to

reuse excavated material on site (where relevant) to reduce imports and HGV movements.

- NCC advised that a standalone mineral safeguarding document, referenced in the Planning Statement, would be its preferred approach if mineral safeguarding is scoped out of the ES. Further engagement would be beneficial once the design and anticipated material quantities are better understood.
- NCC requested that the updated EIA Scoping Area GIS information be shared with it when available, followed by the Order Limits at a later stage to support a final review. NCC will review the updated information and provide any relevant revised minerals and waste GIS datasets where necessary. NCC will also notify the project team if any new mineral or waste developments emerge within the EIA Scoping Area.
- SCC advised that the Proposed Development is unlikely to present a substantive mineral safeguarding issue because it does not affect the Westleton Beds [27]. However, any permanent sterilisation associated with the pipeline components should be quantified and clearly shown on mapping.
- SCC agreed that mineral safeguarding could be scoped out of the ES, provided it is addressed appropriately elsewhere in the DCO documentation. SCC considered that this could be achieved through an appendix to the Planning Statement or a standalone mineral safeguarding document.
- SCC noted that safeguarded sand and gravel represents a valuable, generally high-quality resource and should not be exported. The proposed assessment approach would distinguish between temporary works, components and permanent above-ground components.
- SCC recommended using BGS geological and borehole records, historic MRA reports, particularly those relating to the Waveney Valley, and the Minerals and Waste Plan evidence base, including any relevant emerging proposals, to inform the safeguarding assessment. SCC recommended engaging with NSIP promoters of other projects operating in the SCC administrative area to identify relevant ground investigation data and avoid duplication of survey work.
- SCC noted that offshore aggregate extraction is unlikely to occur close to shore (for the LSO component), with most extraction taking place further offshore. However, SCC advised that capital dredging may warrant consideration in relation to the Area of Future Technical Marine Aggregates Opportunity, including whether any suitable dredged material could be beneficially used and how it would be managed.

21.3.5 The engagement findings above will inform the consideration of likely significant effects on mineral sites and safeguarding designations, the proposed scope of the ES and the scope of any supporting mineral safeguarding assessment. The proposed approach is set out in Section

21.6. Further engagement will be undertaken as the design; anticipated material quantities and the proposed Order Limits are refined.

## 21.4 Baseline Environment

21.4.1 This section summarises the existing and anticipated future baseline environment for materials and waste. Section 21.8 explains how baseline conditions will be assessed for the ES, including the data sources and surveys that will inform the assessment.

### Existing Baseline Conditions

#### Materials Availability

- 21.4.2 The availability of key materials, including water treatment chemicals and wastewater treatment chemicals, required for the construction/decommissioning and/or operation of the Proposed Development at sub-regional, regional, national, international levels as applicable is summarised in Table 21-1, subject to the limitations outlined in Section 21.2.
- 21.4.3 This summary is based on professional judgement, informed by the description of the Proposed Development, the anticipated geographic extent of materials sourcing and waste management, and the availability of published information. At this scoping stage, the quantities of key materials are not yet known and will be reviewed further in the ES.
- 21.4.4 As the design of the Proposed Development is still evolving, detailed information on specific material requirements is currently limited. Consequently, it has not been possible to obtain data for the mechanical and electrical ('M&E') plant likely to be required during construction/decommissioning and/or operation, nor for the materials and products expected to be used in the building fit-out (e.g. partitions, walls, flooring, ceilings; mechanical, electrical and plumbing components; fixtures, fittings and decorative finishes).
- 21.4.5 Nonetheless, based on professional judgement and the operational nature of the Proposed Development, the M&E plant and fit-out materials are

expected to represent a negligible proportion of the overall materials consumed. Furthermore, published information on the availability of these materials is likely to be limited due to supplier confidentiality.

- 21.4.6 At this scoping stage, any specific use of critical raw materials (minerals and metals considered essential to the UK economy and subject to supply risks) is not yet known in the Proposed Development. However, the proposed Advanced Water Recycling Plant ('AWRP') component is expected to require components commonly made from materials on the UK critical minerals list [28], including pumps, tanks, structural steel, pipework, control systems and Supervisory Control and Data Acquisition ('SCADA') equipment.
- 21.4.7 Due to the potential for saline intrusion into the proposed AWRP, certain tanks and pipework will likely need to be constructed from stainless steel to ensure corrosion resistance and long-term durability. This typically requires the use of UK critical minerals such as chromium, nickel and manganese, which provide essential corrosion-resistant properties.

Table 21-1: Baseline Materials Availability in the Expansive Study Area

| Material             | Availability (Mtpa) | Reporting Metric           | Source/ Reporting Year       | Potential Uses of Sustainable Features/Benefits in Water Resources Infrastructure                                                                 |
|----------------------|---------------------|----------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>International</b> |                     |                            |                              |                                                                                                                                                   |
| Bentonite            | 6.8                 | European annual production | IndexBox, 2024               | Can incorporate reclaimed bentonite or suitable industrial by products to reduce virgin extraction.                                               |
| Geotextiles          | 3.6                 | Global annual production   | Global Market Insights, 2024 | Can be manufactured from recycled polymers. Some products are designed for reuse or made from biodegradable fibres to reduce end of life impacts. |

| Material                          | Availability (Mtpa) | Reporting Metric         | Source/ Reporting Year     | Potential Uses of Sustainable Features/Benefits in Water Resources Infrastructure                                                     |
|-----------------------------------|---------------------|--------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Polyelectrolytes/ polyacrylamides | 2.01                | Global annual production | Global Info Research, 2024 | Bio-based chemistries and improved biodegradability are emerging to reduce lifetime impacts.                                          |
| Chloramine (Chlorine)             | 97.3                | Global annual production | Statista, 2022             | Offers longer lasting residuals than chlorine, reducing dosing frequency and chemical use.                                            |
| Sodium hypochlorite               | 3.7                 | Global annual production | IndustryResearch.biz, 2022 | On-site electrolysis using renewable electricity can produce hypochlorite. Optimised dosing lowers lifetime chemical use.             |
| Sulphuric acid                    | 265.0               | Global annual production | Statistica, 2022           | Can be recovered from industrial processes such as smelting of sulphide ores, supporting circular use and reducing virgin production. |
| Citric Acid                       | 3.0                 | Global annual production | IMARC Group, 2024          | Biodegradable and low toxicity. Often produced by fermentation from renewable sugars.                                                 |
| Sodium tripolyphosphate           | 3.3                 | Global annual production | ChemAnalyst 2024           | Lower phosphate alternatives and optimised formulations can reduce eutrophication risk and lifetime impacts.                          |
| Sodium dodecyl sulfonate          | 3.8                 | Global annual production | Global Info Research, 2025 | Can be sourced from bio based feedstocks. Improved biodegradability and lower aquatic toxicity reduce lifetime impacts.               |



| Material                                          | Availability (Mtpa) | Reporting Metric         | Source/ Reporting Year             | Potential Uses of Sustainable Features/Benefits in Water Resources Infrastructure                                                                 |
|---------------------------------------------------|---------------------|--------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Sodium ethylene-diamine-tetraacetic acid ('EDTA') | 0.6                 | Global annual production | Mordor Intelligence, 2025          | Closed loop capture and reuse can reduce discharges. Biodegradable chelating alternatives can substitute EDTA to lower environmental persistence. |
| Hydrogen peroxide                                 | 6.1                 | Global annual production | Mordor Intelligence, 2025          | Decomposes to water and oxygen. On-site generation reduces transport and storage impacts.                                                         |
| Sodium bisulphite                                 | 1.1                 | Global annual production | Market Reports World, 2024         | Can be produced from recovered sulphur bearing streams. Use in closed loop treatment enables optimised dosing and reduced waste.                  |
| <b>National</b>                                   |                     |                          |                                    |                                                                                                                                                   |
| Clays                                             | 2.8                 | UK production            | British Geological Survey, 2024    | Can incorporate reclaimed clay or suitable by products to reduce virgin extraction.                                                               |
| Bricks (all types)                                | 3.0                 | UK production            | British Geological Survey, 2024    | Can incorporate reclaimed bricks or crushed brick fines. Design for disassembly enables reuse and reduces demolition waste.                       |
| Concrete products                                 | 22.4                | UK annual production     | Mineral Products Association, 2023 | Precast elements can integrate recycled aggregates and cement substitutes. Off-site manufacture reduces waste and improves efficiency.            |



| Material                | Availability (Mtpa) | Reporting Metric     | Source/ Reporting Year             | Potential Uses of Sustainable Features/Benefits in Water Resources Infrastructure                                                                  |
|-------------------------|---------------------|----------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Cement-itious materials | 8.6                 | UK production        | Mineral Products Association, 2023 | Can use low carbon cement alternatives and supplementary cementitious materials such as fly ash and ground granulated blast-furnace slag ('GGBS'). |
| Mortar                  | 3.2                 | GB annual production | Mineral Products Association, 2023 | Can use lime based or low carbon binders and recycled sand. Formulations optimised for reversibility enable future reuse of masonry.               |
| Plastic products        | 3.5                 | UK annual sales      | British Plastics Federation, 2024  | High potential for recycled polymer content. Design for recyclability and durability reduces lifetime impacts.                                     |
| Crude steel             | 4.0                 | UK annual production | UK Steel, 2025                     | Steel is highly recyclable. Electric arc furnace routes with high scrap content can significantly lower embodied carbon.                           |
| Wood products           | 9.5                 | UK annual production | Forest Research, 2024              | Sourced from certified sustainable forests (FSC/PEFC) [29]. Use of reclaimed timber and engineered wood products reduces waste and resource use.   |
| Ferric sulphate         | 0.5                 | UK annual production | Research Nester, 2024              | Can be sourced from industrial by products, supporting circular use of iron rich waste streams.                                                    |

| Material                       | Availability (Mtpa) | Reporting Metric     | Source/ Reporting Year                         | Potential Uses of Sustainable Features/Benefits in Water Resources Infrastructure                                                                      |
|--------------------------------|---------------------|----------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sodium hydroxide/ caustic soda | 1.7                 | UK annual production | IndexBox, 2024                                 | Electrolysis using renewable electricity can reduce embodied carbon. Closed loop recovery and reuse within processes reduces waste.                    |
| Lime                           | 1.2                 | UK annual production | BGS Minerals Yearbook, 2023                    | Opportunities for fuel substitution, kiln efficiency and carbon capture can reduce embodied impacts.                                                   |
| <b>East of England</b>         |                     |                      |                                                |                                                                                                                                                        |
| Recycled aggregate             | 2.6                 | 3-year average sales | East of England Aggregates Working Party, 2024 | Directly supports circular economy by reusing construction waste. Reduces demand for virgin aggregates and associated impacts.                         |
| Ready-mixed concrete           | 2.9                 | Annual sales         | Mineral Products Association, 2022             | Can include supplementary cementitious materials (e.g., fly ash, GGBS) and recycled aggregates. Low carbon cement alternatives reduce embodied carbon. |
| Asphalt                        | 2.41                | Annual sales         | Mineral Products Association, 2022             | Can incorporate reclaimed asphalt pavement and recycled materials such as rubber crumb. Warm mix technologies reduce energy use during production.     |

| Material                   | Availability (Mtpa) | Reporting Metric     | Source/ Reporting Year                         | Potential Uses of Sustainable Features/Benefits in Water Resources Infrastructure                                              |
|----------------------------|---------------------|----------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Suffolk County</b>      |                     |                      |                                                |                                                                                                                                |
| Land-won sand and gravel*  | 0.9                 | 3-year average sales | East of England Aggregates Working Party, 2024 | Limited direct reuse. Substitution with recycled aggregates from construction and demolition waste reduces extraction impacts. |
| Marine-won sand and gravel | 0.4                 | 3-year average sales | East of England Aggregates Working Party, 2024 | Similar to land won aggregates. Focus on using secondary or recycled alternatives and reducing transport impacts.              |
| Crushed rock*              | N/A                 | 3-year average sales | East of England Aggregates Working Party, 2024 | Can be replaced with recycled aggregates from demolition waste, reducing quarrying and associated emissions.                   |
| <b>Norfolk County</b>      |                     |                      |                                                |                                                                                                                                |
| Land-won sand and gravel*  | 1.4                 | 3-year average sales | East of England Aggregates Working Party, 2024 | Limited direct reuse. Substitution with recycled aggregates from construction and demolition waste reduces extraction impacts. |
| Marine-won sand and gravel | 0.0                 | 3-year average sales | East of England Aggregates Working Party, 2024 | Similar to land won aggregates. Focus on using secondary or recycled alternatives and reducing transport impacts.              |
| Crushed rock*              | Confidential        | 3-year average sales | East of England Aggregates Working Party, 2024 | Can be replaced with recycled aggregates from demolition waste, reducing quarrying and associated emissions.                   |

| Material                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Availability (Mtpa) | Reporting Metric | Source/ Reporting Year | Potential Uses of Sustainable Features/Benefits in Water Resources Infrastructure |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------|------------------------|-----------------------------------------------------------------------------------|
| <p><u>Notes:</u> * At the end of 2024, Suffolk and Norfolk had landbanks of 8.7 and 12.6 years respectively for sand and gravel, while the East of England had a landbank of 11.6 years for crushed rock. These figures exceed the NPPF’s minimum thresholds of 7 years for sand and gravel and 10 years for crushed rock, indicating a sufficient supply of permitted reserves across the sub-regions and region. Due to its underlying geology, Suffolk has no indigenous sources of crushed rock and relies on imports from the South West, East Midlands and continental Europe. In Norfolk, crushed rock (Carstone) data is combined with limestone figures from Cambridgeshire and Peterborough, and since 2019, also with sandstone figures from Bedfordshire. This aggregation is necessary to protect commercially sensitive information. As a result, crushed rock sales data for the East of England is reported only at the regional level.</p> |                     |                  |                        |                                                                                   |

Allocated Mineral Sites

- 21.4.8 A review of SCC’s Interactive Map of Minerals and Waste Locations of Interest (2025) [30], NCC’s Adopted Minerals and Waste Local Plan Policies Map (2025) [31] and MMO’s Marine Plans Explorer (2024) [32] confirms that there are no allocated mineral sites within the EIA Scoping Area. Other safeguarded mineral designations in the Suffolk and Norfolk sub-regions are shown in Figure 21-1 in Volume III of this Scoping Report.
- 21.4.9 Although the ISEP Guidance’s methodology primarily addresses sterilisation risks to allocated mineral sites, defined as mineral deposits specifically identified in a Local Plan as those that will be mined or extracted, the review of the policies maps also confirmed the absence of any other mineral-related sites within the EIA Scoping Area. This includes facilities essential for extraction, handling, processing, transportation, and storage of minerals. However, the EIA Scoping Area intersects with an MCA.
- 21.4.10 The EIA Scoping Area intersects with the MCA for Kirby Cane Quarry, but neither the buried pipeline component nor its 200m buffer extends into the safeguarded site itself. The MCA identifies where the amenity implications of sensitive development, including quarry-related noise and dust, should be considered. As the pipeline would be underground it would not constitute

a sensitive land use or constrain quarry operations, it is unlikely to affect the future functioning or viability of Kirby Cane Quarry.

- 21.4.11 Notwithstanding the above, policy maps indicate the presence of MSAs within the EIA Scoping Area for sand and gravel in both the Suffolk and Norfolk sub-regions. MSAs are designated to protect known, economically important mineral deposits from unnecessary sterilisation by non-mineral development. Their purpose is to ensure that valuable mineral resources remain accessible for future extraction, thereby supporting long-term resource security and reducing reliance on imported aggregates.
- 21.4.12 The Suffolk and Norfolk MWPA's aim to safeguard MSAs from proposed developments exceeding 5 hectares ('ha') in area in Suffolk and 2ha in area in Norfolk. SCC and NCC would generally not support such development unless it can be demonstrated that: the sand and gravel present is not of economic value; extraction is not practically or environmentally feasible; or the mineral will be worked prior to development or utilised within it.
- 21.4.13 The MMO's Marine Plans Explorer shows that Areas of Future Technical Marine Aggregates Opportunity are present within the EIA Scoping Area, although the overlap is highly localised (refer to Figure 21-1: Allocated Mineral Sites and Other Designations).
- 21.4.14 These areas are safeguarded under Policy AGG3 (Areas of Optimal Aggregate Resource) in the East Inshore and East Offshore Marine Plans [33]. No existing or proposed marine aggregate extraction agreement, licence or lease areas have been identified within the affected part of the EIA Scoping Area.
- 21.4.15 Policy AGG3 of the East Inshore and East Offshore Marine Plans require applicants in these areas to demonstrate either that no viable sand and gravel resource is present, or that their proposal will; not prevent future extraction. Where this cannot be demonstrated, the policy provides for consideration of matters including the development footprint, alternative locations, prior extraction and the justification for the proposed location.

21.4.16 Engagement with SCC and NCC provided further information on the nature and potential importance of mineral resources within the EIA Scoping Area. NCC advised that mineral resources along the route are relatively patchy and that the shallow pipeline works are unlikely to reach the principal resource. SCC advised that the Proposed Development is unlikely to present a substantive mineral safeguarding issue because it does not affect the Westleton Beds.

### Waste Infrastructure Capacity

21.4.17 The current provision of regional and sub-regional waste management infrastructure across the expansive study area is summarised in Table 21-2. This table, prepared from the EA's Waste Data Interrogator 2024 (2025) [34], outlines the range and capacities of operational facilities.

Table 21-2: Throughput or Capacity of Transfer, Treatment, Metal Recycling and Incineration in the Expansive Study Area, 2024

| Site Type                                                 | England<br>(000s tonnes) | East of<br>England<br>(000s tonnes) | Suffolk<br>(000s tonnes) | Norfolk<br>(000s tonnes) |
|-----------------------------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>Transfer (annual throughput)</b>                       |                          |                                     |                          |                          |
| Hazardous waste transfer stations                         | 7,110                    | 281                                 | 152                      | 129                      |
| Household, industrial, commercial waste transfer stations | N/A                      | 885                                 | 420                      | 465                      |
| Non-biodegradable waste transfer stations                 | N/A                      | 0                                   | -                        | -                        |
| <b>Treatment and metal recycling (annual throughput)</b>  |                          |                                     |                          |                          |
| Material recovery                                         | N/A                      | 339                                 | 211                      | 128                      |
| Physical                                                  | N/A                      | 1,721                               | 747                      | 974                      |
| Physico-chemical                                          | N/A                      | 514                                 | 221                      | 293                      |
| Chemical                                                  | N/A                      | 7                                   | 0                        | 7                        |
| Composting                                                | N/A                      | 194                                 | 92                       | 102                      |
| Biological                                                | N/A                      | 274                                 | 103                      | 171                      |
| Metal recycling                                           | N/A                      | 334                                 | 93                       | 241                      |
| <b>Incineration (annual capacity)</b>                     |                          |                                     |                          |                          |
| Municipal and/or Industrial & Commercial                  | N/A                      | 285                                 | 285                      | -                        |

| Site Type                          | England<br>(000s tonnes) | East of<br>England<br>(000s tonnes) | Suffolk<br>(000s tonnes) | Norfolk<br>(000s tonnes) |
|------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| Co-Incineration of Hazardous Waste | 764                      | -                                   | -                        | -                        |
| Hazardous                          | 222                      | -                                   | -                        | -                        |

21.4.18 Where waste cannot be reused, recycled or recovered, landfill disposal is required. Table 21-3 summarises current landfill disposal levels at regional, sub-regional and, where relevant, national scales. Table 21-4 sets out the corresponding availability of merchant landfill void capacity. Based on EA data (2025), these tables illustrate the scale of residual waste disposal and the remaining capacity to accommodate it.

Table 21-3: Waste Disposal to Landfill in the Expansive Study Area, 2024

| Waste Classification                                                                                                                                                                                                                                                                                                                                                                                                             | England<br>(000s tonnes) | East of<br>England<br>(000s tonnes) | Suffolk<br>(000s tonnes) | Norfolk<br>(000s tonnes) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| Inert                                                                                                                                                                                                                                                                                                                                                                                                                            | N/A                      | 813                                 | 449                      | 364                      |
| Non-hazardous                                                                                                                                                                                                                                                                                                                                                                                                                    | N/A                      | -                                   | -                        | -                        |
| Non-hazardous with SNRHW cell*                                                                                                                                                                                                                                                                                                                                                                                                   | N/A                      | 376                                 | 376                      | -                        |
| Hazardous Merchant                                                                                                                                                                                                                                                                                                                                                                                                               | 796                      | 4                                   | 4                        | -                        |
| <b>Total</b>                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>796</b>               | <b>1,194</b>                        | <b>830</b>               | <b>364</b>               |
| <b>Notes:</b> * Some non-hazardous sites can accept some Stable Non-Reactive Hazardous Wastes ('SNRHW') into a dedicated cell, but this is usually a small part of the overall capacity of the site. The EA (2025) also reports that an additional 425,953 tonnes, 221,194 tonnes and 204,759 tonnes of inert / non-hazardous waste was deposited in landfills in the East of England, Suffolk and Norfolk respectively in 2024. |                          |                                     |                          |                          |

Table 21-4: Landfill Void Capacity in the Expansive Study Area, 2024

| Site Type          | England<br>(000s tonnes) | East of<br>England<br>(000s tonnes) | Suffolk<br>(000s tonnes) | Norfolk<br>(000s tonnes) |
|--------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| Inert              | N/A                      | 11,075                              | 8,761                    | 2,315                    |
| Non-hazardous      | N/A                      | 2,872                               | -                        | 2,872                    |
| Non-hazardous with | N/A                      | 2,033                               | 2,033                    | -                        |

| Site Type                                                                                                                                                                                                                                            | England<br>(000s<br>tonnes) | East of<br>England<br>(000s<br>tonnes) | Suffolk<br>(000s<br>tonnes) | Norfolk<br>(000s<br>tonnes) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------|-----------------------------|-----------------------------|
| SNRHW cell*                                                                                                                                                                                                                                          |                             |                                        |                             |                             |
| Hazardous merchant                                                                                                                                                                                                                                   | 13,751                      | -                                      | -                           | -                           |
| <b>Total</b>                                                                                                                                                                                                                                         | <b>13,751</b>               | <b>15,980</b>                          | <b>10,794</b>               | <b>5,187</b>                |
| <b>Notes:</b> * Converted from cubic metres through adoption of the following conversion factors: inert landfills 1.5 tonnes/m <sup>3</sup> , non-hazardous landfills 0.83 tonnes/m <sup>3</sup> and hazardous landfills 1.5 tonnes/m <sup>3</sup> . |                             |                                        |                             |                             |

## Future Baseline Conditions

- 21.4.19 The anticipated construction period for the Proposed Development is currently 2029 to 2032. For the purposes of reporting future baseline conditions, 2030 to 2032 has been used as a representative construction-period baseline. This is because 2030 to 2032 is expected to capture the main period of construction activity, whereas 2029 is anticipated to comprise mobilisation, enabling works and/or a partial construction year.
- 21.4.20 This approach avoids placing undue reliance on a partial year when estimating future baseline conditions, including materials availability and landfill void capacity. The assumption will be reviewed and updated, as required, in the ES once the construction programme is further developed.

## Materials Availability

- 21.4.21 For the future baseline, it is assumed that, in line with current and emerging policy (refer to Appendix 21.1 in Volume II of this Scoping Report), both industry and government would maintain a steady and sufficient supply of indigenous materials throughout the construction, operational and decommissioning phases of the Proposed Development.
- 21.4.22 This supply would meet demand while also supporting a shift towards a more diversified resource base, in line with circular economy principles. For example, Defra's 25 Year Environment Plan (2023) [35] includes a national target to double resource productivity by 2050, aiming to maximise the value and benefits derived from materials.



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### Allocated Mineral Sites

- 21.4.23 For the future baseline, it is assumed that the size and location of allocated mineral sites are expected to remain largely unchanged from current baseline conditions, as these aspects are largely determined by geology.
- 21.4.24 While new sites emerging cannot be completely discounted, the likelihood of additional allocations within the EIA Scoping Area is low because the Suffolk and the Norfolk Minerals and Waste Local Plans already provide for minerals development up to 2036 and 2038, respectively, which is during the operational phase of the Proposed Development.
- 21.4.25 The EIA Scoping Area is also likely to be safeguarded for the Proposed Development under local Minerals and Waste Planning should consent be granted, making it unlikely that MWPAs and/or the MMO/The Crown Estate would license and grant new allocated mineral sites within this area.

### Waste Infrastructure Capacity

- 21.4.26 Trends in waste generation and disposal, landfill void capacity, waste management, and the timeline of landfill waste diversion policies, would suggest that there is likely to be a continued demand for landfill for the foreseeable future (until at least 2050).
- 21.4.27 This assumption is made with reference to the current UK policy for waste, as set out in Defra's 25 Year Environment Plan (2023), which sets a national target to achieve zero avoidable waste by 2050.
- 21.4.28 In the meantime, it is assumed that MWPAs will continue to plan for additional landfill capacity, maintaining provision at existing sites as void space is exhausted and permitting new sites, for example for quarry restoration. Subject to planning permission, new landfill void capacity is likely to be provided to meet any future gaps at a sub-regional, regional (or where justified, national) level.
- 21.4.29 Notwithstanding this, EA data on annual landfill disposal and void capacity changes (2005-2024) has been used to estimate disposal without the

Proposed Development and the void likely available during its construction (approximately 2029 to 2032). These estimates are shown in Table 21-5 and Table 21-6 respectively. Future forecasts for waste disposal and landfill void capacity will be updated in the ES, should new data from the EA become available.

Table 21-5: Estimated Average Waste Disposal to Landfill, 2030-2032

| Waste Classification                                                                                                                                                                                                                                                                                                                                         | England (000s tonnes)* | East of England (000s tonnes)* | Suffolk and Norfolk (000s tonnes)* |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------|------------------------------------|
| Inert                                                                                                                                                                                                                                                                                                                                                        | N/A                    | 4,415                          | 994                                |
| Non-hazardous                                                                                                                                                                                                                                                                                                                                                | N/A                    | 3,851                          | 204                                |
| Hazardous merchant                                                                                                                                                                                                                                                                                                                                           | 612                    | N/A                            | N/A                                |
| <b>Total</b>                                                                                                                                                                                                                                                                                                                                                 | <b>612</b>             | <b>8,266</b>                   | <b>1,199</b>                       |
| <b>Notes:</b> * These estimates assume the continuation of the following median annual capacity change, in waste disposal, as that reported by the EA for 2005 to 2024: East of England: inert and non-hazardous landfill (1.6% and -1.7%); Suffolk and Norfolk: inert and non-hazardous landfill (2.9% and -8.4%); and England: hazardous landfill (-3.7%). |                        |                                |                                    |

Table 21-6: Estimated Average Annual Landfill Void Capacity, 2030-2032

| Site Type                                                                                                                                                                                                                                                                                                                                                                                   | England (000s tonnes)* | East of England (000s tonnes)* | Suffolk and Norfolk (000s tonnes)* |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------|------------------------------------|
| Inert                                                                                                                                                                                                                                                                                                                                                                                       | N/A                    | 67,548                         | 12,666                             |
| Non-hazardous                                                                                                                                                                                                                                                                                                                                                                               | N/A                    | 13,447                         | 3,448                              |
| Hazardous merchant                                                                                                                                                                                                                                                                                                                                                                          | 11,194                 | N/A                            | N/A                                |
| <b>Total</b>                                                                                                                                                                                                                                                                                                                                                                                | <b>11,194</b>          | <b>80,995</b>                  | <b>16,114</b>                      |
| <b>Notes:</b> * These estimates assume the continuation of the following median annual capacity change, in the subtraction/addition of lan void capacity, as that reported by the EA for 2005 to 2024: East of England: inert and non-hazardous landfill (7.2% and -6.0%); Suffolk and Norfolk: inert and non-hazardous landfill (1.9% and -4.9%); and England: hazardous landfill (-2.9%). |                        |                                |                                    |

## Sensitivity of Receptors

21.4.30 A summary of the provisional sensitivity of the materials and waste baseline receptors is provided in Table 21-7. Professional judgement has been applied in order to determine the sensitivity of these receptors according to the ISEP Guidance thresholds/criteria set out in Table 21-9 and Table 21-10

within Section 21.8. This is based on the anticipated future baseline conditions.

Table 21-7: Sensitivity of Receptors, 2030-2032

| Matters                                        | Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Sensitivity                            |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Materials availability                         | Overall, the materials required for the construction/decommissioning and/or operation of the Proposed Development are expected to include a proportion that would experience known supply or stock issues and/or offer limited sustainable features. This also reflects uncertainty about possible use of critical raw materials.                                                                                                                                                                                                                                                                      | High*                                  |
| Allocated mineral sites                        | There are unlikely to be any allocated mineral sites present within the EIA Scoping Area at the time of constructing/decommissioning and/or operating the Proposed Development. The EIA Scoping Area intersects MSAs in Suffolk and Norfolk and has a localised interaction with an Area of Future Technical Marine Aggregates Opportunity. Engagement with SCC and NCC indicates that the potential for substantive terrestrial mineral sterilisation may be limited, having regard to the nature and distribution of the mineral resource and the likely depth and permanence of the proposed works. | N/A – no sensitivity criteria provided |
| Inert and non-hazardous landfill void capacity | The sub-regional inert and non-hazardous landfill void capacity (without the Proposed Development) is expected to reduce considerably by 6-10% across the construction phase/first three years of commissioning the Proposed Development*.                                                                                                                                                                                                                                                                                                                                                             | High                                   |
| Hazardous landfill void capacity               | The national hazardous landfill void capacity (without the Proposed Development) is expected to reduce very considerably (by >1%) across the construction phase/first three years of commissioning the Proposed Development (operation).                                                                                                                                                                                                                                                                                                                                                               | Very High                              |

**Notes:** \* A High sensitivity rating has been applied as a 'cautious 'worst case' approach' (in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) to reflect uncertainty about the potential use of critical raw materials in the Proposed Development. In addition, certain materials planned to be used for the Proposed Development's construction/decommissioning and operation are assessed as High sensitivity because of known supply constraints and limited sustainable attributes. These include: polyelectrolytes, chloramine, sodium tripolyphosphate, sodium dodecyl sulfonate, hydrogen peroxide, crude

| Matters | Summary                                                                                                                                                                                                                                                                                                                                              | Sensitivity |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|         | steel, ferric sulphate and crushed rock. If subsequent design and procurement confirm that these materials are not required, or that certified substitutes and recycled or secondary sources are used instead, the sensitivity ratings for the affected materials will be revised in the ES in line with the ISEP Guidance's assessment methodology. |             |

## 21.5 Likely Significant Effects

### Construction Phase

#### Materials Availability

- 21.5.1 Construction of the Proposed Development is anticipated to require a substantial, though currently as yet undetermined, quantity of materials. This demand has the potential to impact the immediate and, in the case of primary materials, long-term availability of natural resources, resulting in temporary or permanent adverse impacts through resource depletion.
- 21.5.2 Some of these materials would originate off-site, purchased as primary construction materials and products, but some would arise on-site, particularly excavated materials from earthworks activities, and recycled aggregates from site enabling works, or recycled materials brought in from off-site.
- 21.5.3 Whilst the Proposed Development is intended to balance cut and fill quantities to minimise the need to import or export earthworks materials, the nature of the proposed works means that achieving this balance may not be practicable (e.g. for constructing the above ground components of the Proposed Development, such as the AWRP and Service Reservoirs ('SRs')). Notwithstanding this, considerable quantities of other construction materials would still need to be imported, such as those exemplified in Table 21-1.
- 21.5.4 In accordance with the ISEP Guidance, significant environmental effects could occur in instances where materials consumed in constructing the Proposed Development have known stock and supply constraints and/or comprise little or no sustainable features and benefits compared to industry-

standard materials and constitute a substantial share of the baseline market capacity for that material (e.g. stocks, production or sales).

### Landfill Void Capacity

- 21.5.5 The construction phase of the Proposed Development is expected to generate a sizable, though currently unquantified, amount of waste. This will include construction, demolition and excavation ('CD&E') materials, as well as commercial and industrial ('C&I') waste and municipal solid waste ('MSW') arising from site operations and workforce activities.
- 21.5.6 Given most of the construction works for the Proposed Development will be for the pipeline components, excavation arisings are expected to dominate gross arisings on the linear sections of the Proposed Development, with a large proportion of these typically returned to trench or re-used under an MMP in accordance with the CL:AIRE Definition of Waste Code of Practice. By contrast, the Proposed Development's above-ground components, such as the SRs and the AWRP are expected, due to the nature of the construction works required, to offer less opportunity to reuse site-won excavated material beyond engineered fill and sub-base.
- 21.5.7 According to Defra's UK Statistics on Waste (2025) [36], the UK construction sector generated approximately 112.4Mt of CD&E waste in 2020. This comprised 59.4Mt of construction and demolition ('C&D') waste and 53Mt of excavation waste. In the same year, total construction output was valued at £100,328 million, based on the Office for National Statistics' Construction Statistics Annual Tables (2020) [37].
- 21.5.8 Using these national totals as a value-based indicator, a waste intensity of about 112 tonnes per £100,000 of construction output is anticipated. This is a useful UK level benchmark for context only. If this ratio were applied to a project with a capital cost similar to the Proposed Development, it could indicate an estimated waste generation of around 250,000 tonnes of CD&E waste before reuse and recovery (or approximately 130,240 tonnes of C&D waste, excluding excavation waste).

- 21.5.9 The net waste requiring off-site management is expected to be markedly lower for the pipeline components of the Proposed Development, once on-site return to trench and compliant re-use under an approved Materials Management Plan are implemented. By contrast, the Proposed Development's above-ground components, such as the SRs and the AWRP, are likely to provide fewer technically suitable opportunities for re-use, because of the required engineering specifications. As a result, a higher proportion of excavated materials from these discrete assets is expected to require off-site treatment or disposal.
- 21.5.10 In accordance with the ISEP Guidance, significant environmental effects could arise where future landfill capacity is expected to decline substantially due to waste generated during the construction phase (excluding the Proposed Development), and where additional arisings from the Proposed Development would materially reduce the remaining void capacity.

## 21.6 Impacts Scoped Out of the Assessment

### Construction Phase – Mineral Sites and Designations

- 21.6.1 Construction of the Proposed Development will require land for both temporary and permanent purposes. Permanent land take within or adjacent to mineral safeguarding sites may affect access to mineral resources or result in sterilisation, thereby limiting their availability for future extraction.
- 21.6.2 Sterilisation occurs when development or changes in land use constrain or prevent the extraction of mineral resources. This can happen directly, through construction over the resource, or indirectly, where proximity to development renders future extraction impractical due to environmental, operational or amenity constraints.
- 21.6.3 In accordance with the ISEP Guidance, likely significant environmental effects could arise if allocated mineral sites are substantially sterilised and prior extraction is not feasible. However, as outlined in paragraph 21.4.23,

no allocated mineral sites are likely to be present within the Order Limits at the time of constructing the Proposed Development.

- 21.6.4 On this basis, the likelihood of sterilising allocated mineral sites is considered negligible. Allocated mineral sites are subject to strategic planning and are typically safeguarded through site-specific policies and allocations. Their absence from the EIA Scoping Area supports the proposal to scope likely significant effects on allocated mineral sites out of the assessment in the ES.
- 21.6.5 Notwithstanding the absence of allocated mineral sites, the EIA Scoping Area intersects MSAs for sand and gravel in Suffolk and Norfolk. The extent of overlap exceeds the relevant plan thresholds of 5ha in Suffolk and 2ha in Norfolk. The EIA Scoping Area also has a localised interaction with an Area of Future Technical Marine Aggregates Opportunity safeguarded under Policy AGG3 of the East Inshore and East Offshore Marine Plans.
- 21.6.6 MSAs and Areas of Future Technical Marine Aggregates Opportunity are safeguarding designations rather than allocated mineral extraction sites. Their purpose is to alert decision-makers to the potential presence of mineral resources and ensure that any unnecessary sterilisation is considered through the planning and consenting process.
- 21.6.7 Engagement with SCC and NCC in July 2026 confirmed that terrestrial mineral safeguarding can be scoped out of the ES, provided that it is addressed proportionately elsewhere in the DCO application documentation. A proportionate MRA will therefore be prepared outside the ES and referenced from the Planning Statement. Its final location within the application documentation, whether as a standalone document or an appendix to the Planning Statement, will be confirmed as the DCO documents develop.
- 21.6.8 The MRA will distinguish between temporary works, buried infrastructure and permanent above-ground assets. It will focus on permanent infrastructure within MSAs, quantify the extent of any permanent sterilisation, consider the scale and depth of excavation and the quantity of



excavation arisings, and identify opportunities for beneficial on-site reuse. The MRA will be informed by relevant BGS geological and borehole records, historic MRAs, Minerals and Waste Local Plan evidence and available ground investigation information.

- 21.6.9 Further engagement will be undertaken with SCC and NCC as the design, anticipated material quantities and proposed Order Limits are refined. Updated GIS information and the proposed Order Limits will be shared with the MWPAs to support their final review. The localised interaction with the Area of Future Technical Marine Aggregates Opportunity will be considered through the MRA or other appropriate marine planning documentation, with further engagement with the MMO undertaken where necessary.
- 21.6.10 Potential effects on allocated mineral sites (both terrestrial and marine) and interactions with other mineral safeguarding designations are therefore proposed to be scoped out of the ES. This approach avoids duplication between the ES and the mineral safeguarding documentation while ensuring that relevant terrestrial and marine safeguarding policies are addressed through the DCO application.
- 21.6.11 Route refinement and design development have avoided the permitted mineral site at Haddiscoe and will continue to seek to minimise permanent land take and unnecessary sterilisation within mineral safeguarding designations, where practicable. Suitable safeguarded sand and gravel incidentally extracted during construction will be reused within the Proposed Development where technically and environmentally appropriate.
- 21.6.12 Whilst the above measures support the approach to mineral safeguarding, they are not relied upon as the basis for scoping the matter out of the ES.

### **Operational Phase – All Materials and Waste Matters**

- 21.6.13 The ISEP Guidance specifies that the assessment of likely significant effects resulting from a proposed development's operational phase should be assessed over the course of any one full and justifiably representative year within the first three years of its operation.



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- 21.6.14 The materials consumed and the waste generated during the operation and maintenance of the Proposed Development would be associated with the components described in chapter 2 of this Scoping Report. Based on professional judgement in light of the nature of these components, no significant materials consumption or waste generation is likely to occur during the first three years of the Proposed Development's operational phase.
- 21.6.15 Given the operational nature of the Proposed Development, annual materials consumption is expected to be negligible (small in market-capacity terms), including water treatment chemicals estimated at approximately 26,000tpa, of which around 96% relates to ultra-filtration cleaning chemicals (sodium hypochlorite and citric acid). Any CD&E waste, commercial and industrial waste, or MSW generated during operation or maintenance is also anticipated to be negligible.
- 21.6.16 The Proposed Development will also generate a saline effluent stream during the operation of the AWRP, which is intended for discharge to the sea via a long sea outfall. Although this discharge will result from the Proposed Development, it is proposed that this element be scoped out of the materials and waste assessment in the ES, in accordance with the limitations for liquid wastes set out in paragraphs 21.8.43 to 21.8.46.
- 21.6.17 The operational materials consumption and waste generation described above, excluding the saline effluent discharge, which is addressed separately, are likely to be insignificant in the context of the materials availability outlined in Table 21-1 and the landfill capacities presented in Table 21-6. This determination has been made in the context of the ISEP Guidance, the available materials and landfill capacity baseline described in Section 21.4 and considering the magnitude of impact criteria provided in Section 21.8.
- 21.6.18 It is, therefore, proposed that the Proposed Development's operational phase materials consumption and waste generation effects, excluding the saline effluent discharge addressed separately in paragraph [21.6.16](#), be
-

scoped out of further assessment in the ES. This is because the likely quantities of materials consumed and waste generated during operation are expected to be negligible and are not likely to give rise to likely significant effects in the context of the baseline conditions described in Section 21.4 and the assessment criteria set out in Section 21.8.

21.6.19 Section 21.7 nevertheless identifies operational good practice measures relevant to materials and waste management. In addition, the operation of the Proposed Development would be subject to applicable legislative requirements and existing consenting regimes, including the Environmental Permitting Regulations, where relevant to the operation of facilities such as water recycling, transfer and storage infrastructure.

21.6.20 These measures and controls provide additional assurance in relation to the management of operational materials and waste but are not relied upon as the basis for the conclusion that likely significant effects can be scoped out of further assessment in the ES. The Proposed Development operational phase materials consumption and waste generation effects are scoped out on the basis that the Proposed Developments operational materials and waste requirements are not anticipated to give rise to likely significant effects having regard to the nature, scale and characteristics of the Proposed Development. Existing consenting and regulatory regimes, including the Environmental Permitting Regulations, provide a robust framework for the control and management of materials and waste during operation. Whilst these represent tertiary mitigation measures, they provide further assurance that potential environmental effects would be appropriately managed and would not result in significant adverse effects.

### **Decommissioning Phase – All Materials and Waste Matters**

21.6.21 The operational life of the Proposed Development is expected to be a minimum of 80 years. It is anticipated that future advancements in materials technologies and waste management infrastructure will differ markedly from current baseline conditions, particularly in relation to the reuse, recycling, recovery or disposal of waste.

- 
- 21.6.22 The 80-year design life applies to the Proposed Development as a whole. Components with shorter design lives would naturally be subject to a defined maintenance and replacement strategy throughout the operational phase of the Proposed Development.
- 21.6.23 Decommissioning activities for the Proposed Development are anticipated to involve the removal of above-ground infrastructure components (including the proposed AWRP, CSR and WSR). The underground infrastructure including pipeline components (and LSO options) are anticipated to be left in-situ (but could potentially be removed). The full detail on anticipated decommissioning activities will be included within the ES. Any decommissioning activities would follow the statutory process in place at that time. Whilst, the detailed approach cannot be defined for the decommissioning stage, it is reasonably assumed that materials would be reused, recycled or otherwise recovered where practicable, in accordance with the waste hierarchy and applicable legislative requirement.
- 21.6.24 On this basis, decommissioning is proposed to be scoped out of the assessment. However, mitigation measures requiring the application of Circular Design Principles will ensure consideration of durability and low maintenance of structures and components, and the recoverability of materials at end of first life.
- 21.6.25 This approach is consistent with the assessment reported in chapter 16 climate change of this Scoping Report, which includes maintenance, repair, replacement and refurbishment within the operational greenhouse gas emissions assessment but scopes out a separate assessment of decommissioning greenhouse gas emissions.

## **21.7 Proposed Approach to Mitigation**

- 21.7.1 Mitigation would be implemented to reduce the potential impacts associated with the consumption of materials, sterilisation of allocated mineral sites or other mineral safeguarded areas, and the generation and disposal of waste during the implementation of the Proposed Development. There is

considerable synergy between the materials and waste matters, and thus substantial overlap between the mitigation measures.



Figure 21-2: Waste Hierarchy (European Commission, no date) [38]

- 21.7.2 Minimising the consumption of material resources that suffer from known stock and supply issues, maximising the consumption of materials comprising a high proportion of sustainable features and benefits, and diverting surplus materials and waste from landfill would reduce the potential for adverse effects. Avoiding unnecessary mineral sterilisation and beneficially using suitable incidentally extracted material would also support compliance with relevant mineral safeguarding policies.
- 21.7.3 Primary, secondary and tertiary mitigation measures, and enhancement measures would be implemented for materials and waste in line with the definitions provided in chapter 3 EIA methodology. These measures would seek to deliver outcomes that align with the waste hierarchy as illustrated in Figure 21-2 and encourage, and evidence, transitions towards a circular economy as illustrated in Figure 21-3.



Figure 21-3: A Circular Economy (European Parliament, no date) [39]

21.7.4 It is important to note that the outline mitigation measures described below should be treated as preliminary and will be reviewed and developed as the Proposed Development's design evolves and further survey data is available. A preliminary summary of mitigation measures is provided below.

### Primary (Inherent) Mitigation

21.7.5 The following primary mitigation measures may be included as an inherent part of the Proposed Development's design:

- Implementing Circular Design Principles to identify, prioritise and select opportunities to improve resource efficiency and design out waste:
  - *Build nothing*: refuse unnecessary new construction and maximise retention and reuse of existing assets and materials).
  - *Build for long-term use*: design for longevity, adaptability and disassembly, and integrate digital asset information).
  - *Build efficiently*: eliminate unnecessary components, maximise material efficiency and use lean construction techniques).

- *Build with the right resources*: minimise the use of virgin and non-renewable materials, reduce the use of carbon-intensive materials and design out hazardous/polluting materials).
- Avoiding allocated mineral sites and reducing permanent land take within MSAs and other mineral safeguarding designations to minimise unnecessary sterilisation, where practicable.

### Secondary (Foreseeable) Mitigation

21.7.6 The following potential secondary mitigation measures may be implemented in order to reduce adverse environmental effects during the construction phase of the Proposed Development:

- Incorporation of suitable refuse and recycling collection systems/space within the Proposed Development to allow the Applicant opportunities to manage their operational waste in line with its Duty of Care requirements.
- Implementation of a Sustainable Procurement Plan ('SPP') to encourage the specification, procurement and use of circular, responsibly sourced and non-hazardous construction materials and products, where practicable.
- Preparing a proportionate MRA outside the ES and referenced from the Planning Statement. The MRA will assess the interaction between the Proposed Development and relevant mineral safeguarding designations and demonstrate how applicable safeguarding policies have been addressed [40].
- Maximising the beneficial reuse of suitable excavation arisings and incidentally extracted minerals within the Proposed Development, subject to geotechnical suitability, environmental acceptability and compliance with applicable waste legislation.
- Implementing the Site Waste Management Plan ('SWMP') to ensure the efficient use of material resources, minimisation of waste, and reduction in the quantity of waste disposal to landfill. A secondary objective would be to apply circular economy principles to support resource efficiency, productivity and decarbonisation.

21.7.7 The SPP and SWMP would be prepared as part of the Construction Environmental Management Plan ('CEMP') developed by the appointed Contractor following consent. These plans will include appropriate targets and key performance indicators ('KPI') for both materials and waste.

21.7.8 These targets and KPIs will be aligned with current UK government policy, industry standards and the Applicant's own commitments, such as those

outlined in Northumbrian Water Group's Environment Strategy (2025) [41]. This includes its priority of valuing resources and eliminating waste through:

- Reducing resource use and sourcing sustainably.
- Recovering energy and materials from its processes.
- Eliminating avoidable waste.

### Tertiary (Inexorable) Mitigation

21.7.9 The following tertiary mitigation measures would be implemented to address reasonably foreseeable impacts during the construction of the Proposed Development. In addition, further tertiary measures may be identified through the EIA process where necessary to respond to specific impact pathways or sensitivities identified during the assessment:

- Complying with waste duty of care requirements for the safe management of waste to protect human health and the environment.
- Managing all waste in line with the waste hierarchy and the proximity principle, which prioritises treatment or disposal close to the point of production where practicable.
- Obtaining all necessary waste carrier registrations; environmental permits, mobile plant deployments and/or waste exemptions.
- Accurately describe waste before recovery or disposal, and perform characterisation and, if needed, waste acceptance testing.
- Ensuring that all waste: is transported by registered waste carriers; is accompanied by waste transfer / consignment notes; and is taken to licensed, permitted or exempt facilities authorised to accept it.

21.7.10 These measures either fulfil existing legislative requirements or represent standard practice for preparing documentation in line with statutory, industry, and end-of-life quality protocols, including the MMP and SMP within the Code of Construction Practice [42].

21.7.11 The tertiary mitigation measures provided in paragraph 21.7.9 for the construction phase would equally apply to the Applicant during the operational phase of the Proposed Development, especially those pertaining to waste Duty of Care requirements.

21.7.12 The Environmental Permitting Regulations regulate industrial operational processes, such as water recycling, transfer and storage infrastructure, to



limit the generation and disposal of waste. It is anticipated that the relevant Environmental Permits would impose standards throughout the operational phase of the regulated components of the Proposed Development.

- 21.7.13 Furthermore, it is also assumed that any waste from operating and maintaining the Proposed Development would be managed in line with the Applicant's current Environmental Management Systems and Standard Operating Procedures (e.g. risk assessments and method statements).

## 21.8 Proposed Approach to the ES

### Best Practice Guidance

- 21.8.1 The assessment of effects on materials and waste will follow the standard industry approach as set out in the ISEP Guidance.
- 21.8.2 This section describes the approach to the ES for materials and waste, including stakeholder consultation, baseline data collation, information requirements, assessment methodology, cumulative effects and relevant standards.
- 21.8.3 It also explains the use of aspect-specific significance of effect criteria for materials and waste, which differ from the general criteria presented in chapter 3 EIA methodology.

### Assessment Methodology

- 21.8.4 The ES assessment will determine the likely significant effects of construction material consumption and waste generation and disposal during the construction phase of the Proposed Development. Potential likely significant effects on allocated mineral sites and interactions with other mineral safeguarding designations are proposed to be scoped out of the ES.
- 21.8.5 In accordance with the ISEP Guidance, the likely significant effects will be determined by assessing the sensitivity of, and magnitude of impact on, material consumption, allocated mineral sites and interactions with other mineral safeguarding designations and waste generation. The assessment



will identify the principal sources and quantities of construction materials required, the types and quantities of waste expected to be generated and disposed of, and the timescales over which materials are likely to be consumed and waste generated.

- 21.8.6 The Proposed Development design is at an early stage, and there is currently limited information available regarding precise material requirements and expected waste generation and disposal. As the design develops greater certainty, such information is expected to be available. This would be outlined in the ES.
- 21.8.7 The existing and future baseline conditions presented in Section 21.4 will be reviewed and updated for the ES using the most recent available information. The use of 2030 to 2032 as the representative construction-period baseline within the anticipated construction period of 2029 to 2032 will also be reviewed once the construction programme is further developed.
- 21.8.8 The ES will draw on relevant consultation responses received during the DCO process. Further consultation specific to the ES materials and waste assessment is not currently anticipated, however this position will be kept under review throughout the EIA process and up to the point of submission of the DCO application, when the scope and findings of the assessment will be finalised.
- 21.8.9 Proportionate engagement with SCC and NCC and, where relevant, the MMO will continue separately in relation to the MRA and mineral safeguarding as the design, anticipated material quantities and EIA Scoping Area and Order Limits are refined.
- 21.8.10 The following data will be collected in relation to the materials matters associated with the Proposed Development:
- A detailed Bill of Quantities (or equivalent).
  - Information on materials and products that would comprise (or incorporate) secondary or recycled content.

- 
- Information on known sustainability credentials of materials and products to be consumed (e.g. through Environmental Product Declarations).
  - Any planned use of 'critical raw materials' (materials of high importance within the UK economy where security of supply is at risk).
  - The cut and fill balance; and the quantity of excavated arisings that would be reused or recycled, on or off-site.
  - The types and quantities of any materials that would be recovered from on or off-site sources for construction.
- 21.8.11 Information on permanent infrastructure within MSAs, including sterilisation, excavation requirements and beneficial reuse opportunities for incidentally extracted material, will be collected separately to inform the MRA.
- 21.8.12 The following data will be collected in relation to the waste matters associated with the Proposed Development:
- The types and quantities of CD&E waste that are likely to be generated during the construction, including any hazardous waste.
  - The types and quantities of CD&E waste expected to be recovered and diverted from landfill, based on project-specific data or reasonable assumptions drawn from relevant statistics or industry guidance.
  - The types and quantities of waste to be disposed of to landfill.
- 21.8.13 The mitigation measures suggested in Section 21.7 would also be reviewed during the preparation of the ES.

## Sensitivity of Receptors

### Materials

- 21.8.14 The provisional sensitivity of the materials and waste receptors is summarised in Section 21.4. The following criteria will be used to review and determine receptor sensitivity in the ES.
- 21.8.15 The sensitivity of materials relates to the availability of resources expected to be consumed during the construction phase of the Proposed Development. Sensitivity will be determined by identifying where one or more of the criteria in Table 21-8 are met.
- 21.8.16 No specific sensitivity criteria are defined for allocated mineral sites. This is

because their influence is not based on a simple present or absent test. Instead, consideration is given to the extent to which the Proposed Development may affect the viability of their future extraction, which is assessed through professional judgement.

21.8.17 Accordingly, allocated mineral sites are considered within the magnitude of impact criteria provided in Table 21-10, where the degree of sterilisation or constraint, having regard to the scale, location and importance of the site, is used to inform the level of impact.

Table 21-8: Sensitivity Criteria for Materials (ISEP, 2020)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Very High</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | On balance, the key materials required for the construction of the Proposed Development are known to be insufficient in terms of production, supply and/or stock#, and/or comprise no sustainable features and benefits compared to industry standard materials*.                                        |
| <b>High</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | On balance, the key materials required for the construction of the Proposed Development are forecast to suffer from known issues regarding supply and stock#, and/or comprise little or no sustainable features and benefits compared to industry-standard materials*.                                   |
| <b>Medium</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | On balance, the key materials required for the construction of the Proposed Development are forecast to suffer from some potential issues regarding supply and stock, and/or are available comprising some sustainable features and benefits compared to industry-standard materials*.                   |
| <b>Low</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | On balance, the key materials required for the construction of the Proposed Development are forecast to be generally free from known issues regarding supply and stock, and/or are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials*. |
| <b>Negligible</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | On balance, the key materials required for the construction of the Proposed Development are forecast to be free from known issues regarding supply and stock, and/or are available comprising a very high proportion of sustainable features and benefits compared to industry standard materials*.      |
| <p>Notes: * Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a Circular Economy; or in some other way reduce lifetime environmental impacts.</p> <p>#In the absence of the ISEP Guidance, any 'critical raw materials' used in the Proposed Development would be assigned a High or Very High sensitivity rating based on the application of professional judgment.</p> |                                                                                                                                                                                                                                                                                                          |

## Waste

21.8.18 The sensitivity of waste relates to availability of regional (or where justified, national) landfill void capacity in the absence of the Proposed Development.

This is assessed by applying the following two-step process set out in the ISEP Guidance:

- The quantity of waste for disposal expected to be generated within the expansive study area (regionally or nationally) would be calculated by analysing available data, and by providing justified forecasts over the construction phase of the Proposed Development.
- The quantity of forecast waste for disposal within the expansive study area would then be compared to the remaining landfill void capacity (considering any consented increases in future capacity if known), to identify expected losses during the construction phase of the Proposed Development.

21.8.19 The following criteria in Table 21-9 and Table 21-10 will be used to determine the sensitivity of inert/non-hazardous and hazardous landfill void capacity respectively.

Table 21-9: Sensitivity Criteria for Inert and Non-hazardous Waste Landfill Void Capacity (ISEP, 2020)

|                  |                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Very High</b> | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is expected to reduce very considerably: (by >10%); is already known to be unavailable; or would require new capacity or infrastructure to be put in place to meet forecast demand. |
| <b>High</b>      | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is expected to reduce considerably: by 6-10% as a result of wastes forecast.                                                                                                        |
| <b>Medium</b>    | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is expected to reduce noticeably: by 1-5% as a result of wastes forecast.                                                                                                           |
| <b>Low</b>       | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is expected to reduce minimally: by <1% as a result of wastes forecast.                                                                                                             |

|                   |                                                                                                                                                                                                                                                                                                  |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Negligible</b> | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) inert and non-hazardous landfill void capacity is expected to remain unchanged or is expected to increase through a committed change in capacity. |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 21-10: Sensitivity Criteria for Hazardous Waste Landfill Void Capacity (ISEP, 2020)

|                   |                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Very High</b>  | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is expected to reduce very considerably: (by >1%); is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand. |
| <b>High</b>       | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is expected to reduce considerably: by 0.5-1% as a result of wastes forecast.                                                                                                       |
| <b>Medium</b>     | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is expected to reduce noticeably: by 0.1-0.5% as a result of wastes forecast.                                                                                                       |
| <b>Low</b>        | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is expected to reduce minimally: by <0.1% as a result of wastes forecast.                                                                                                           |
| <b>Negligible</b> | Across the construction phase, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill void capacity is expected to remain unchanged or is expected to increase through a committed change in capacity.                                                                                  |

## Impact Magnitude

21.8.20 The magnitude of impact will be assessed over the construction period of the Proposed Development, from the commencement of site access and enabling works in approximately 2029 to the commencement of operation in approximately 2033. The assessment will consider impacts arising from materials consumption and waste generation and disposal over this period.

## Materials

21.8.21 The methodology for assessing the magnitude of impact from material resource consumption is based on a percentage-based approach. This

method is used to evaluate the influence of materials consumption on baseline market capacity during construction of the Proposed Development.

21.8.22 The magnitude of impact from material resource consumption will be determined using the material-consumption criteria presented in Table 21-11. The allocated mineral site elements of the ISEP criteria will not be applied in the ES unless the Order Limits or mineral-site baseline changes materially.

Table 21-11: Magnitude Criteria for Materials (ISEP, 2020)

|                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Major</b>                                                                                                                                                                                                                                                                                                                                                        | The consumption of one or more materials is >10% by volume of the regional* baseline availability; and/or more than one allocated mineral site is substantially# sterilised by the Proposed Development rendering it inaccessible for future use.                                                        |
| <b>Moderate</b>                                                                                                                                                                                                                                                                                                                                                     | The consumption of one or more materials is between 6-10% by volume of the regional* baseline availability; and/or one allocated mineral site is substantially# sterilised by the Proposed Development rendering it inaccessible for future use.                                                         |
| <b>Minor</b>                                                                                                                                                                                                                                                                                                                                                        | The consumption of one or more materials is between 1-5% by volume of the regional* baseline availability; and/or the Proposed Development has the potential to adversely and substantially# impact access to one or more allocated mineral sites (in their entirety), placing their future use at risk. |
| <b>Negligible</b>                                                                                                                                                                                                                                                                                                                                                   | The consumption of no individual material type is equal to or greater than 1% by volume of the regional* baseline availability.                                                                                                                                                                          |
| <b>No change</b>                                                                                                                                                                                                                                                                                                                                                    | No material consumption is required.                                                                                                                                                                                                                                                                     |
| <p>Notes:</p> <p>* or where justified, national.</p> <p>#justified using professional judgement, based on the scale and nature of the allocated mineral site. The allocated mineral site elements of the ISEP criteria are reproduced for completeness. They will not be applied in the ES unless the Order Limits or mineral-site baseline changes materially.</p> |                                                                                                                                                                                                                                                                                                          |

## Waste

21.8.23 The magnitude of impact from the generation of inert, non-hazardous and hazardous waste will be assessed using a percentage-based approach. This involves determining the proportion of remaining landfill void capacity that would be depleted by waste generated during the construction phase of

the Proposed Development. The assessment criteria is Table 21-12 for inert and non-hazardous waste, and in Table 21-13 for hazardous waste.

Table 21-12: Magnitude Criteria for Inert and Non-hazardous Waste Landfill Void Capacity (ISEP, 2020)

|                                                                                                                                 |                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>Major</b>                                                                                                                    | Waste generated by the development will reduce regional* landfill void capacity baseline# by >10%.  |
| <b>Moderate</b>                                                                                                                 | Waste generated by the development will reduce regional* landfill void capacity baseline# by 6-10%. |
| <b>Minor</b>                                                                                                                    | Waste generated by the development will reduce regional* landfill void capacity baseline# by 1-5%.  |
| <b>Negligible</b>                                                                                                               | Waste generated by the development will reduce regional* landfill void capacity baseline# by <1%.   |
| <b>No change</b>                                                                                                                | Zero waste generation and disposal from the Proposed Development.                                   |
| <b>Notes:</b><br>* or where justified, national.<br># forecast as the worst-case scenario, during a defined construction phase. |                                                                                                     |

Table 21-13: Magnitude Criteria for Hazardous Waste Landfill Void Capacity (ISEP, 2020)

|                                                                                              |                                                                                                       |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Major</b>                                                                                 | Waste generated by the development will reduce national landfill void capacity baseline# by >1%.      |
| <b>Moderate</b>                                                                              | Waste generated by the development will reduce national landfill void capacity baseline# by 0.5-1%.   |
| <b>Minor</b>                                                                                 | Waste generated by the development will reduce national landfill void capacity baseline# by 0.1-0.5%. |
| <b>Negligible</b>                                                                            | Waste generated by the development will reduce national landfill void capacity baseline# by <0.1%.    |
| <b>No change</b>                                                                             | Zero waste generation and disposal from the Proposed Development.                                     |
| <b>Notes:</b><br># forecast as the worst-case scenario, during a defined construction phase. |                                                                                                       |

## Effect Significance

21.8.24 The significance of effect will be determined by combining receptor sensitivity and impact magnitude using the matrix in Table 21-14. Effects of moderate significance or above will be considered significant.



21.8.25 Where the matrix identifies a range of potential outcomes, professional judgement will be used to determine the applicable category, and the reasoning will be clearly explained.

Table 21-14: Significance Matrix for Materials and Waste (ISEP, 2020)

| Sensitivity/Value |            | Magnitude of Impact |                   |                    |                     |                     |
|-------------------|------------|---------------------|-------------------|--------------------|---------------------|---------------------|
|                   |            | No Change           | Negligible        | Minor              | Moderate            | Major               |
|                   | Very High  | Neutral             | Slight            | Moderate or Large  | Large or Very Large | Very Large          |
|                   | High       | Neutral             | Slight            | Slight or Moderate | Moderate or Large   | Large or Very Large |
|                   | Medium     | Neutral             | Neutral or Slight | Slight             | Moderate            | Moderate or Large   |
|                   | Low        | Neutral             | Neutral or Slight | Neutral or Slight  | Slight              | Slight or Moderate  |
|                   | Negligible | Neutral             | Neutral           | Neutral or Slight  | Neutral or Slight   | Slight              |

### Mitigation and Residual Effects

21.8.26 Mitigation will follow the hierarchy of avoid, minimise, restore and compensate, where applicable, taking account of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [43] and the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) [44],[45] as amended.

21.8.27 The Materials and Waste chapter of the ES will assess effects both before and after the implementation of mitigation measures:

- Pre-mitigation effects (or 'unmitigated effects'): Effects that would occur in the absence of any mitigation.

21.8.28 Residual effects: Effects that remain after the implementation of mitigation measures (primary, secondary, and tertiary), representing the '*cautious worst-case approach*' in accordance with the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment (July 2026) [46].



21.8.29 Residual effects (those remaining after all mitigation) will be clearly reported within the ES. These will take account of primary, secondary and tertiary mitigation measures incorporated into the Proposed Development.

21.8.30 Where additional secondary mitigation is identified as necessary, the proposed measures and their anticipated effectiveness will be described and considered in the assessment of residual effects.

### **In-combination Effects**

21.8.31 This section considers potential in-combination effects, where different environmental effects from the Proposed Development may combine to have a greater effect on a common receptor. Relevant downstream or consequential effects are also considered. Inter-project cumulative effects, arising from interaction with other existing or reasonably foreseeable developments, are considered where relevant.

21.8.32 Whilst the materials and waste assessment has synergies with the assessments set out in chapter 16 climate change (greenhouse gas emissions) and chapter 19 ground conditions (soils and potential contaminated land) of this Scoping Report, these other assessments do not impact the same receptors as the materials and waste assessment. Therefore, in-combination effects are not possible.

21.8.33 The potential for interactions with other environmental aspect assessments will be kept under review during preparation of the ES. Where relevant interactions with materials and waste receptors are identified, these will be considered within the assessment.

21.8.34 In contrast to other environmental aspects in this EIA Scoping Report, impacts from the consumption of material resources and the generation and disposal of waste, such as the depletion of material resources and landfill void capacity, are largely dispersed, rather than affecting specific receptor(s) that are local to the Proposed Development.

21.8.35 It is not possible to assess the materials and waste effects of downstream developments that would use the Proposed Development as a water source

(e.g. pipelines or developments beyond the EIA Scoping Area). This is because the location and, therefore, baseline environment for such facilities and their design/nature are not yet known such that no meaningful assessment can be undertaken.

- 21.8.36 Information on these associated developments may not be fully available at the point of determination of the DCO application. Nevertheless, they will be kept under review as the assessment progresses. Where sufficient information is available, these schemes will be considered as part of the inter-project cumulative effects assessment in the ES, using a proportionate approach that may include qualitative consideration or reasonable assumptions. Whilst such facilities may be subject to their own permissions and permits, these processes would consider those schemes individually and do not remove the need to consider potential inter-project effects with the Proposed Development, where relevant information is available.
- 21.8.37 The assessment of inter-project cumulative materials and waste effects cannot be carried out in a manner similar to other environmental topics because there is an insufficient causal link between a committed development and its drawdown effects on materials availability and landfill void capacity at specific or shared receptors. Further commentary on this consideration is provided in paragraphs 21.8.43 to 21.8.62.
- 21.8.38 Furthermore, this assessment cannot be undertaken in the same manner as other environmental aspects because of the varying and extensive spatial scope of the expansive study area. As outlined in Section 21.2, the study area encompasses sub-regional and regional availability of construction materials in the East of England, and, where justified, extends to national or international sources. It also includes remaining landfill void space at a sub-regional level and, where appropriate, at a national level.
- 21.8.39 MWPA's have a statutory duty to ensure that an appropriate amount of minerals and waste management capacity is planned for and available over a defined period. This duty also requires consideration of minerals and

waste movements across authority boundaries to maintain a co-ordinated and sustainable approach.

- 21.8.40 Within this context, it is neither necessary nor practicable or proportionate for each committed development within the expansive study area to replicate, in effect, the strategic planning function of the MWPAs as part of an EIA. Instead, the assessment will focus on identifying potential constraints and ensuring that the Proposed Development does not materially compromise the ability of the MWPAs to discharge their statutory responsibilities by consuming materials or using landfill void capacity beyond typical business-as-usual levels.
- 21.8.41 Notwithstanding this, the materials and waste assessment methodology accounts for materials availability, waste generation, and disposal trends driven by developments in the expansive study area. Therefore, the consideration of inter-project cumulative effects is inherent to the methodology set out in Section 21.8. As such, this approach already incorporates additive cumulative effects of materials consumption and waste disposal by other developments.
- 21.8.42 In addition, and as stated in Section 21.3, consultation and engagement will be undertaken with the relevant MWPAs throughout the EIA process. This will provide the MWPAs with information on the likely order of magnitude of materials consumption and waste management requirements, supporting transparency and alignment with their planning functions.

### Limitations and Assumptions

- 21.8.43 The ISEP Guidance's methodology defines materials as physical resources consumed throughout a development's lifecycle. In alignment with this guidance, material assessments are typically confined to solid substances. Whilst gases are generally excluded from the definition of materials in the ISEP Guidance, the consideration of liquids is not excluded.
- 21.8.44 Liquid wastes have been excluded from the proposed approach to the assessment of waste matters. Current waste management regulations

- 
- prohibit the disposal of liquid wastes in landfills; therefore, they do not consume void space and including them would fall outside the scope and objectives of this assessment.
- 21.8.45 This exclusion applies solely to liquid wastes and does not extend to liquid materials, which are proposed for use in the operational phase of the Proposed Development for water transfer and wastewater treatment. Their inclusion is consistent with the ISEP Guidance's methodology for assessing materials matters.
- 21.8.46 Furthermore, where applicable, waste liquids and gases are addressed in other chapters of this Scoping Report, including chapter 9 water environment; chapter 15 air quality and odour; chapter 16 climate change; chapter 18 human health; chapter 19 ground conditions; and chapter 22 major accidents and disasters.
- 21.8.47 Materials and waste can influence a wide range of environmental topics. Depending on how these are managed, other effects may arise from the Proposed Development, such as energy consumption; greenhouse gas emissions; water consumption and pollution; dust, noise and vibration; and vehicle emissions and traffic changes.
- 21.8.48 Where relevant, the impacts of materials use and waste management are considered in the respective chapters of this Scoping Report, including: chapter 10 landscape and visual; chapter 9 water environment; chapter 13 traffic and access; chapter 14 noise and vibration; chapter 15 air quality and odour; chapter 16 climate change; chapter 18 human health; and chapter 19 ground conditions.
- 21.8.49 The baseline data sources used in this Scoping Report represent the most recently available information. However, there is typically a period of time before UK datasets relating to materials availability, mineral safeguarding sites and landfill void capacity are updated to account for the most recent data. Conditions may have changed since the publication of these data.
-

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- 21.8.50 In addition, it is inherently difficult to define the precise stock, production or sales of specific water treatment chemicals and wastewater treatment chemicals. These products are often reported only at aggregated levels within broader chemical categories. The data presented in Table 21-1 should therefore be regarded as an approximate order of magnitude only, rather than definitive values.
- 21.8.51 Waste transfer, treatment, recycling and recovery infrastructure facilities are considered beneficial in managing arisings higher up the waste hierarchy and supporting a circular approach to materials management. While these facilities help reduce the magnitude of adverse impacts associated with waste generation and disposal, they are not considered sensitive receptors in the same way as landfills, which are finite resources.
- 21.8.52 Existing baseline capacity and capability of waste infrastructure is provided in Section 21.4. However, future baseline conditions have not been included, as this is not required under the ISEP Guidance and therefore cannot be consistently assessed. Nonetheless, these facilities will be considered as part of future baseline reporting in the ES (see paragraph 21.8.7).
- 21.8.53 At this scoping stage, there is limited information available regarding the precise quantities of materials and waste associated with the construction, operational and decommissioning phases of the Proposed Development. These limitations are typical of scoping assessments undertaken early in the design lifecycle, and the information presented is considered proportionate.
- 21.8.54 It will be the appointed Contractor's responsibility to source materials and manage waste during the construction phase. Typically, the appointed Contractor would aim to use local material sources and waste infrastructure wherever practicable, to reduce environmental impacts and transport costs, and to support the economic well-being of local communities.
- 21.8.55 Procurement rules prevent the EIA process from identifying or prescribing specific material suppliers and waste management facilities with certainty.
-

These rules also prevent setting precedents that could tie the appointed Contractor to exclusive arrangements. This information is therefore not currently available and is unlikely to be fully known at the point of DCO application submission. As a result, environmental effects associated with specific material sources or waste facility locations cannot be assessed.

- 21.8.56 Impacts from material consumption and waste management are generally dispersed and do not affect specific receptor locations. Therefore, it is not possible to assess, either qualitatively or quantitatively, the indirect environmental effects from upstream materials extraction and production facilities or downstream waste management and disposal facilities within the expansive study area. The exception to this is carbon emissions, which are addressed in chapter 16 climate change.
- 21.8.57 It is proposed that any additional indirect environmental effects associated with materials sourcing and waste disposal be excluded from future assessment in the ES. This is based on the premise that such effects are too distant for a causal link to the Proposed Development to be considered likely significant effects of the Proposed Development, and because specific sources of materials or waste disposal locations cannot be identified.
- 21.8.58 Consequently, there is considered to be an insufficient causal link between the Proposed Development and any indirect environmental effects, due to the: unknown location and baseline environment of such facilities, which will remain unknown during the EIA process; and inability to apportion indirect effects across the various projects in the expansive study area that would use these facilities through complex supply chains.
- 21.8.59 It is assumed that any significant indirect environmental effects arising from upstream material extraction and production, and downstream waste management and disposal, have already been assessed under existing consenting regimes, including but not limited to:
- Marine and Coastal Act 2009 (as amended).
  - The Town and Country Planning Act 1990 (as amended).

- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended).
- The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended).
- The Environmental Permitting Regulations 2016 (as amended).

21.8.60 Under these regimes, environmental regulators would have set planning or permitting controls to mitigate any likely significant effects from these sites. These controls require specific environmental standards and mitigation measures at regulated facilities. While such controls cannot guarantee that no significant effects will occur, they make significant effects unlikely.

21.8.61 Despite limitations in determining material provenance and waste management methods or locations, potential mitigation measures have been identified at this stage (refer to Section 21.7). These measures aim to reduce material consumption, increase the use of sustainably sourced content, maximise diversion of waste from landfill, and ensure compliance with duty of care requirements.

21.8.62 Although no identifiable causal link exists, these measures and standard practices can be relied upon to further mitigate any residual indirect environmental effects associated with materials consumption and waste generation and disposal. The Proposed Development can influence environmental compliance through the SPP, proportionate procurement requirements and due diligence, but cannot directly control or guarantee the performance of independently operated upstream or downstream facilities.

## 21.9 Summary of Impacts and Effects

21.9.1 Table 21-15 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the materials and waste chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 21-15: Summary of Materials and Waste Scope

| Receptor                  | Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                     | Scoped in/Scoped out |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------------------------------------------|----------------------|
| <b>Construction Phase</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                       |                                     |                                                |                                                                |                      |
| Materials availability    | Construction of the Proposed Development has the potential to consume a substantial quantity of materials, which may affect short-term resource availability and, for primary materials, influence long-term supply. These pressures could lead to temporary or permanent adverse effects through resource depletion. On balance, the sensitivity of materials within the expansive study area during the anticipated construction period is assessed as High. Material quantities, provenance and composition remain uncertain at this stage and will depend on final design, procurement strategies, and availability of responsibly sourced materials. In addition, the extent to which critical raw materials may be required is currently unknown. | Negligible to Minor   | High                                | Not Significant or Significant*                | Implementing Circular Design Principles; and Developing a SPP. | Scoped in            |
| Allocated mineral sites   | Construction of the Proposed Development is not expected to result in permanent land take within or adjacent to allocated mineral sites. The EIA Scoping Area intersects MSAs in Suffolk and Norfolk and has a localised                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | No change/ Negligible | N/A – refer to paragraph 21.8.16.   | Not significant                                | Avoiding allocated mineral sites and minimising                | Scoped out           |



| Receptor          | Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                     | Scoped in/Scoped out |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                   | interaction with an Area of Future Technical Marine Aggregates Opportunity. These are safeguarding designations rather than allocated mineral extraction sites. Engagement with SCC and NCC has confirmed that terrestrial mineral safeguarding can be scoped out of the ES, provided that it is addressed appropriately elsewhere in the DCO application documentation. A proportionate MRA will therefore be prepared outside the ES and referenced from the Planning Statement. The approach to the marine safeguarding designation will be addressed through the MRA or other appropriate marine planning documentation, with further engagement with the MMO where necessary. |                       |                                     |                                                | unnecessary sterilisation; Reusing suitable incidentally extracted minerals; and Preparing a proportionate MRA outside the ES. |                      |
| Landfill capacity | Construction of the Proposed Development has the potential to generate a substantial quantity of CD&E waste. Effective planning and robust management will be essential to minimise environmental impacts and regulatory risks. Inadequate management could strain regional waste facilities and reduce landfill void space, a finite resource. Forecasts indicate highly constrained landfill                                                                                                                                                                                                                                                                                     | Negligible to Minor   | High to Very High                   | Not Significant or Significant*                | Implementing Circular Design Principles; Developing an SPP, SWMP, MMP, SMP;                                                    | Scoped in            |

| Receptor                 | Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                           | Scoped in/Scoped out |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------|
|                          | capacity during the anticipated construction period, with sensitivity assessed as High for inert/non-hazardous landfill and Very High for hazardous landfill. Waste quantities, classifications and management methods remain uncertain at this stage and will depend on design and construction methods.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |                                     |                                                | Duty of Care compliance; and Obtaining necessary permits and registrations.                                          |                      |
| <b>Operational Phase</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                                     |                                                |                                                                                                                      |                      |
| All                      | Operation and maintenance of the Proposed Development would require limited quantities of materials and generate small quantities of waste. Based on professional judgement and the nature of the Proposed Development, no substantial materials consumption or waste generation is anticipated during one full and justifiably representative year within the first three years of commissioning. Annual materials consumption, including water treatment chemicals, is expected to be negligible in the context of available materials resources, and any CD&E waste, commercial and industrial waste, or municipal solid waste generated during operation and maintenance is also anticipated to be negligible. No allocated mineral sites are expected to be affected during operation. Consistent with the | Negligible            | High to Very High                   | Not significant                                | Implementing Circular Design Principles; Duty of Care compliance; and Obtaining necessary permits and registrations. | Scoped out           |

| Receptor                     | Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures               | Scoped in/Scoped out |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|------------------------------------------|----------------------|
|                              | precautionary approach adopted for the construction phase, the same sensitivity assumptions have been applied for materials availability and landfill capacity when determining the likely significance of effects.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |                                     |                                                |                                          |                      |
| <b>Decommissioning Phase</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |                                     |                                                |                                          |                      |
| All                          | Decommissioning of the Proposed Development could require materials and generate waste. Decommissioning activities for the Proposed Development are anticipated to involve the removal of above-ground infrastructure components. The underground infrastructure including pipeline components are anticipated to be left in-situ (but could potentially be removed). Any decommissioning activities would follow the statutory process in place at that time. Whilst, the detailed approach cannot be defined for the decommissioning stage, it is reasonably assumed that materials would be reused, recycled or otherwise recovered where practicable, in accordance with the waste hierarchy and applicable legislative requirement.<br><br>Over this timescale, future baseline conditions, including materials availability, | N/A - Not assessed    | N/A - Not assessed                  | N/A - Not assessed                             | Implementing Circular Design Principles. | Scoped out           |

| Receptor | Effects                                                                                                                                                                              | Anticipated Magnitude | Anticipated Importance /Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------|----------------------|
|          | waste management infrastructure, landfill capacity, technologies and resource recovery practices, cannot be predicted with sufficient confidence to support a meaningful assessment. |                       |                                     |                                                |                            |                      |

## Notes:

\* Likely significant effects on materials and waste have been assessed at the scoping stage as falling within the ‘slight or moderate’ category, which crosses the threshold between significant and not significant. Due to current limitations in data on material quantities, provenance, composition, and on waste quantities, classifications and management methods, these matters are scoped into the ES having applied reasonable worst-case assumptions supported by professional judgment and experience on NSIPs.

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## 22 Major Accidents and Disasters

### 22.1 Introduction

- 22.1.1 This chapter describes the proposed scope and methodology for the assessment of the likely significant effects arising from the construction, operation and decommissioning phases of the Suffolk Water Recycling, Transfer and Storage Project (the 'Proposed Development') in connection with Major Accidents and Disasters ('MA&D'). The assessment will be presented within an Environmental Statement ('ES') submitted with the application for a Development Consent Order ('DCO').
- 22.1.2 The chapter describes the methodology to be used for the assessment, the data that will inform the assessment and an overview of the baseline conditions. It also identifies the potential likely significant effects to be considered within the assessment, those effects that are proposed to be scoped out with supporting justification, and the embedded and additional mitigation measures that may be required to avoid, prevent, reduce or offset significant adverse effects associated with MA&D. The chapter further explains how the potential effects will be assessed and reported within the ES.
- 22.1.3 The EIA Scoping Area is shown on Figure 1-1. This chapter should be read in conjunction with chapters 6-21 of this Scoping Report, to provide a comprehensive environmental context for the risks associated with MA&D. Whilst this chapter draws on baseline information relevant to these other environmental aspect chapters, the assessment considers extreme and highly unlikely events, focusing on accident and disaster scenarios not reasonably covered by the assessments of other chapters.
- 22.1.4 The chapter considers both the vulnerability of the Proposed Development to major accidents or disasters arising from natural or man-made hazards (external hazards), and the potential for the Proposed Development itself to cause major accidents or disasters (internal hazards).

22.1.5 This chapter has been prepared by suitably qualified and experienced environmental professionals with expertise in environmental impact assessment and the consideration of MA&D for major infrastructure projects, in accordance with the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2007 [1], [2] (as amended in 2017).

## 22.2 Study Area

22.2.1 The study area for the Proposed Development is defined by the EIA Scoping Area (as shown on Figure 1-1), which includes the built development footprint and associated infrastructure during the operational phase, together with the areas required for construction and decommissioning works during these respective phases, and the Zone of Influence ('Zoi'), representing the spatial extent within which hazards and related environmental effects could reasonably occur during all phases of the Proposed Development. This approach ensures that potential direct, indirect and cumulative effects are properly identified at this scoping stage, in accordance with relevant MA&D legislation and guidance.

22.2.2 The study area has been defined to capture both internal and external factors that may have adverse consequences on, or arise as a result of, the Proposed Development. At this scoping stage, a combination of development components, hazard characteristics, receptors and potential source-pathway-receptor relationships has been used to inform the proposed scope of the assessment in the major accidents and disasters chapter of the ES. Where relevant, precautionary screening distances have been applied to ensure that no credible MA&D-related interactions are omitted from consideration at this scoping stage. These distances are used solely to inform scoping and do not represent consultation distances, impact extents or limits to potential MA&D effects, nor do they imply that effects would be confined to these distances:

- Manmade features – the following components of the Proposed Development:

- Proposed Advanced Water Recycling Plant ('AWRP'), including modifications to the existing Lowestoft WRC.
- Proposed Long Sea Outfall ('LSO').
- Proposed Central Service Reservoir ('CSR').
- Proposed Western Service Reservoir ('WSR').
- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
- Proposed CSR to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to Sizewell C Nuclear Power Station ('SZC') Pipeline.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains
- Manmade features – external to the Proposed Development:
  - Airports and airfields within a 13km (general safeguarding zone) radius from the EIA Scoping Area.
  - Control of Major Accident Hazard ('COMAH') facilities within a 5km radius from the EIA Scoping Area.
  - Contaminated land and migration pathways within the EIA Scoping Area.
  - Unexploded Ordnance ('UXO') risk areas (identified through UXO desk study and survey) within the EIA Scoping Area.
  - Major accident hazard pipelines ('MAHP') within a 1km radius from the EIA Scoping Area.
  - Fuel retail sites (including liquified natural gas ('LNG') and liquified petroleum gas ('LPG')) within a 1km radius from the EIA Scoping Area.
  - Rail and major roads infrastructure within a 500m radius from the EIA Scoping Area.
  - Transmission networks (gas, electrical, oil/fuels) crossing within the EIA Scoping Area.
  - Sizewell A Nuclear Power Station ('SZA') (under decommissioning), Sizewell B Nuclear Power Station ('SZB') (operational) and SZC (under construction) – nuclear power plants.
- Natural features with potential to create risks:
  - Hydrological and geological hazards of a regional nature (dam or reservoir failure sources, seismic activity) within a 3km radius from the EIA Scoping Area.

- Localised hydrological, hydrogeological and geological hazards (flood risk and unstable ground conditions, including associated failure mechanisms) within a 1km radius from the EIA Scoping Area.

22.2.3 Natural and geotechnical hazards with the potential to affect, or be affected by, the Proposed Development include hydrological, hydrogeological and geological processes such as flooding, ground instability and structural failure mechanisms associated with the service reservoirs, pipelines and related infrastructure. While relevant design standards and regulatory regimes are expected to reduce the likelihood of such events, the potential consequences of failure or malfunction are considered credible at this scoping stage, having regard to the scale of the Proposed Development and the presence of downstream and off-site receptors. These hazards are therefore considered on a consequence-led basis to inform the scope of assessment to be undertaken within the major accidents and disasters chapter of the ES.

22.2.4 Potential ground instability, landslides, mass movement and sinkhole formation are proposed to be scoped into the assessment of likely significant effects during the construction phase of the Proposed Development, recognising the potential effects of excavation, trenching, temporary works and changes to ground conditions. Although desk-based information indicates generally low susceptibility across the study area, intrusive ground investigation and detailed ground modelling are ongoing. A precautionary approach is therefore proposed to be adopted at this scoping stage, and the scope of assessment will be refined at the ES stage of the EIA process as further site-specific information becomes available.

22.2.5 The spatial buffers applied in this assessment are based on The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) (where applicable to the proposed LSO component), and other relevant regulatory requirements and sector best practice guidance.



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22.2.6 Table 22-1 summarises the study area parameters applied at this scoping stage, together with the relevant legislative, policy and guidance context. Where no fixed statutory distance exists, distances have been selected on a precautionary basis with reference to recognised guidance and datasets. These distances may be refined, reduced or removed entirely as the design of the Proposed Development evolves and as the EIA process progresses.

Table 22-1: Study Area Parameters, Distances and Regulatory/Guidance Basis

| Category                                         | Feature/Hazard                                                                                                                                                       | Applied Distance/Area                                | Legal/Guidance Basis                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Man-made (the Proposed Development's components) | The proposed pumping station and modifications (subsidiary component) at the existing Lowestoft WRC as part of the proposed AWRP component.                          | Within built development footprint.                  | No statutory buffer. Included as part of the Proposed Development and assessed under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, and general health and safety duties.                                                                                                                                                                                                                       |
|                                                  | Construction-phase hazards associated with pipeline installation (including trench collapse, horizontal directional drilling ('HDD') frac-out and bore instability). | Construction working area.                           | No fixed legal distance; included due to construction phase accident potential and proximity risks under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) (where applicable to the proposed LSO component) and Health and Safety at Work Act 1974 ('HSWA') [3].                                          |
|                                                  | The proposed AWRP component's chemical storage, process areas and delivery routes.                                                                                   | Within operational area.                             | No statutory buffer. Fire/explosion hazards controlled by Dangerous Substances and Explosive Atmospheres Regulations 2002 [4] ('the DSEAR Regulations'). No fixed (buffer distances) radius in law; operational area comprises the full extent of on-site processes where hazardous substances are stored, transferred or handled, from delivery and unloading through to storage, internal transfer routes and operational use. |
|                                                  | The proposed WSR and CSR components and downstream flood path                                                                                                        | Built development footprint and hydraulic flow path. | No fixed statutory buffer; pathway-based inclusion following Environment Agency ('EA') flood/breach assessment principles and reservoir safety guidance [5].                                                                                                                                                                                                                                                                     |

| Category                                           | Feature/Hazard                                                                     | Applied Distance/Area                        | Legal/Guidance Basis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Man-made<br>(External to the Proposed Development) | Airports and airfields.                                                            | 13km                                         | Aerodrome safeguarding per UK Civil Aviation Authority ('CAA') CAP 738 [6] guidance. Official safeguarding maps typically extend to large radii (often 13–15km) depending on Obstacle Limitation Surface ('OLS') and Instrument Flight Procedures ('IFPs'). A 13km radius is adopted as a precautionary EIA screening distance to identify potential aviation-related MA&D interactions at the scoping stage.                                                                                                                                                                                                                           |
|                                                    | The Control of Major Accident Hazards ('COMAH') establishments (upper/lower tier). | 5km (precautionary screening).               | The COMAH Regulations 2015 [7] require external (off-site) emergency plans for upper-tier sites covering all areas where people/environment may be affected by a major accident scenario. The Health and Safety Executive ('HSE') [8] sets site-specific consultation distances rather than fixed radii; for EIA scoping purposes, a 5km precautionary screening distance is applied to identify relevant external emergency planning zones and potential off-site consequence pathways. COMAH emergency planning arrangements are treated as response measures and are not relied upon at the scoping stage to scope out MA&D effects. |
|                                                    | Contaminated land and migration pathways.                                          | As identified by desk study/risk assessment. | Regulated by Part 2A of the Environmental Protection Act 1990 [9] and EA Land Contamination Risk Management ('LCRM') [10]. No statutory buffer: extent follows conceptual site model and pathways.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                    | Unexploded ordnance ('UXO') risk areas (onshore and offshore including the         | As identified (UXO desk study/surveys).      | No statutory buffer. UXO risk management will follow industry best practice, including the Construction Industry Research and Information Association's CIRIA C681 Unexploded Ordnance: A Guide for the Construction                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Category | Feature/Hazard                                 | Applied Distance/Area | Legal/Guidance Basis                                                                                                                                                                                                                                                                                                                                                         |
|----------|------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | proposed LSO section of the EIA Scoping Area). |                       | Industry 2009 [11], and relevant Ministry of Defence ('MoD')/Defence Infrastructure Organisation ('DIO') guidance [12], which set out the recognised framework for UXO risk assessment, mitigation and management in the UK; inclusion based on evidence-led desk study and surveys.                                                                                         |
|          | Major Accident Hazard Pipelines ('MAHP').      | 1km                   | United Kingdom Onshore Pipeline Operators' Association ('UKOPA') [13] guidance provides industry good practice on the assessment of pipeline hazards. For EIA scoping purposes, a 1km radius is commonly applied as a precautionary screening distance for high-pressure pipelines, pending confirmation of operator-specific hazard distances or formal consultation zones. |
|          | Fuel retail sites (petrol, LPG, LNG).          | 1km                   | The DSEAR Regulations and Petroleum (Consolidation) Regulations 2014 [14] govern storage/dispensing of petrol, no fixed planning radius. 1km used as a precautionary scoping buffer for localised fire/explosion risk (supported by Petroleum Enforcement and Liaison Group ('PELG') Red Guide (Guidance on managing the risks of fire and explosion)) [15].                 |
|          | Rail and major roads infrastructure.           | 500m                  | No statutory buffer. 500m used as good-practice screening to capture hazardous load transport and collision/incident risks within EIA scoping (consistent with scoping approach set out in the Planning Inspectorate's Nationally Significant Infrastructure Projects ('NSIPs'): Pre-Application Advice on Environmental Impact Assessment [16]).                            |

| Category         | Feature/Hazard                                                                                          | Applied Distance/Area                                        | Legal/Guidance Basis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Marine navigation and vessel interaction (during the construction phase of the proposed LSO component). | Construction marine exclusion zone and temporary works area. | Marine navigation risks are governed by the Merchant Shipping Act 1995 [17] and the International Regulations for Preventing Collisions at Sea ('COLREGs') [18], supported by Maritime and Coastguard Agency ('MCA') [19] guidance. Risks are managed through notices to mariners, marine coordination procedures and, where applicable, harbour authority controls.<br>No fixed radius as this is defined by construction activity zone. Applies during construction when vessel interactions are possible. |
|                  | Transmission networks (gas, electricity, oil/fuels).                                                    | Where crossing/adjacent to site.                             | Engagement with asset owners required. For electricity, safety clearances apply (National Grid guidance). For gas/oil pipelines, UKOPA/Institution of Gas Engineers and Managers [20] technical codes and HSE land-use planning processes apply where assets are MAH (including safety distances).                                                                                                                                                                                                           |
|                  | SZC and strategic infrastructure.                                                                       | Project-specific interaction zone.                           | Included due to functional interdependency (water supply resilience) in line with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and, where relevant, The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017), to consider interactions with other developments. Considered qualitatively for cascading MA&D effects (utility failure, security risks).                                                                                     |
| Natural Features | Hydrological & geological hazards (regional: dam failure sources, seismic).                             | 3km                                                          | No fixed legal radius. Distance reflects screening for reservoir breach pathways and regional geohazards following EA dam-breach guidance and British Dam Society reservoir safety materials.                                                                                                                                                                                                                                                                                                                |

| Category         | Feature/Hazard                                                                         | Applied Distance/Area | Legal/Guidance Basis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|----------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural Features | Hydrogeological /hydrological/geological hazards (local: flood risk, unstable ground). | 1km                   | <p>No fixed legal radius. Therefore, a 1km radius from the EIA Scoping Area is proposed as a precautionary distance to ensure that all relevant localised natural hazards in the vicinity of the Proposed Development are appropriately accounted for.</p> <p>Screening assessment draws on EA flood-risk and groundwater guidance – vulnerability mapping (including inputs used for Health Impact Assessment [21] and British Geological Survey ('BGS') GeoSure [22] ground-stability datasets to identify localised hydrogeological and geological hazards.</p> |

22.2.7 Appendix 22.1 to this chapter sets out the relevant legislation, policy and guidance relevant to the major accidents and disasters chapter of the ES. The relevant legislation and policy will be updated accordingly through the EIA process and detailed fully within the ES.

## 22.3 Consultation and Engagement

22.3.1 A virtual meeting was held on 17 March 2026 with representatives from Suffolk County Council ('SCC'), East Suffolk Council ('ESC'), South Norfolk District Council ('SNDC'), Great Yarmouth Borough Council ('GYBC') and the Broads Authority ('BA') ('the LPAs') to discuss the proposed approach to scoping the MA&D assessment.

22.3.2 During the virtual meeting, a number of queries were raised and discussed. This feedback included the potential risks associated with SZB as well as SZC, marine pollution risks during the Proposed Development's construction and operational phases, the risks posed by UXO, the potential risk of breach associated with the proposed WSR and CSR components of the Proposed Development and the nature of chemicals and chemical storage at the proposed AWRP component. These risks have been considered in this chapter and are reflected within the identified MA&D hazards (Table 22-4) and the summary of effects (Table 22-9).

## 22.4 Baseline Environment

22.4.1 The baseline environment has been established for the study area as identified in Section 22.2, using a structured approach that reflects the key components of the Proposed Development, external hazard sources, and natural environmental conditions.

22.4.2 This approach ensures that baseline conditions are clearly linked to hazard identification and subsequent source–pathway–receptor analysis for MA&D.

22.4.3 Baseline data is sourced from robust and recognised datasets and site-specific investigations to inform hazard identification, vulnerability assessment and risk evaluation for MA&D. Key sources include:

- EA flood risk maps [23], [24].
- BGS data on ground stability and subsidence.
- Natural England datasets [25] on designated sites, ecological receptors and other sensitive environmental receptors.
- HSE data on hazardous installations and pipelines [26].
- HSE's Public Information Search under the COMAH Regulations 2015.
- Local authority emergency planning zones and resilience frameworks.
- National Risk Register ('NRR') [27] 2025.
- Defra [28] and EA climate risk projections.
- Historical incident records (e.g. flooding, infrastructure failure).
- Site-specific geotechnical investigations (e.g. subsidence risk).
- Infrastructure condition assessments (e.g. pipeline integrity).
- Ordnance Survey mapping [29].
- Environmental permitting data (e.g. discharge points and treatment performance).
- International Disaster Database [30].

22.4.4 Additional data sources may be considered in the ES, subject to the data included within the relevant technical chapters.

### Baseline Characterisation Approach

22.4.5 The MA&D baseline describes:

- Existing environmental and infrastructure conditions within the study area and vulnerabilities relevant to the Proposed Development.
- External hazard sources that may affect the Proposed Development.
- Sensitive receptors at risk of significant effects from the Proposed Development.
- Existing MA&D risks within the study area.
- Potential MA&D during the Proposed Development's construction, operational and decommissioning phases.
- External MA&D events that may impact the Proposed Development.

22.4.6 The baseline is established through:

- Desk-based review of datasets identified in Section 22.2.
- Stakeholder consultation with relevant authorities, including the EA and the LPAs.



- 
- Targeted site-specific surveys and inspections, where necessary and applicable, to verify conditions and identify vulnerabilities, such as:
    - Geotechnical investigations (e.g. for sinkhole or subsidence risk).
    - Infrastructure condition assessments (e.g. for pipeline integrity).
    - Environmental permitting data (e.g. discharge points and treatment performance).
- 22.4.7 The aim is to define current environmental conditions, infrastructure sensitivities, and potential receptors that could be affected by MA&D scenarios associated with the Proposed Development.
- 22.4.8 An initial scoping exercise was carried out to identify and review all MA&D relevant to the Proposed Development. This process was informed by the hazards listed in the Institute of Sustainability and Environmental Professionals' ('ISEP') (formerly the Institute of Environmental Management and Assessment ('IEMA')) Major Accidents and Disasters in EIA: A Primer (2020) [31] (the 'ISEP Guidance') and the NRR. The findings indicate the Proposed Development's potential vulnerability to major accidents and/or disasters arising from a range of possible events.
- 22.4.9 This scoping exercise has considered the following key factors when determining which events are relevant to the Proposed Development:
- Events that are highly unlikely to occur due to the nature of the Proposed Development or its location.
  - Events that could occur, but for which the Proposed Development and associated receptors are no more vulnerable than any other development or would experience no significant impact if they did occur.
  - Events that could occur and to which the Proposed Development may be vulnerable, or that the Proposed Development could potentially exacerbate.
- 22.4.10 In applying these criteria, this chapter has considered the different components of the Proposed Development and their specific characteristics. The baseline characteristics and their relevance to MA&D are described below for the principal components of the Proposed Development and their associated sections of the EIA Scoping Area. These components have been grouped where baseline characteristics and MA&D
-

relevance are considered to be similar. This approach ensures that hazard identification appropriately reflects differences in location, function, and environmental context.

### **Above-Ground Treatment and Storage Infrastructure**

22.4.11 This includes the sections of the EIA Scoping Area for the following components of the Proposed Development:

- Proposed AWRP.
- Proposed CSR.
- Proposed WSR.

### **Baseline Characteristics:**

- Predominantly rural and semi-rural setting, comprising agricultural land, dispersed settlements and existing infrastructure.
- Variable ground conditions, including superficial deposits and underlying geology (refer to chapter 19 ground conditions for further details).
- Freshwater and terrestrial habitats support protected species and ecological networks. The EIA Scoping Area is located in proximity to internationally and nationally designated sites (e.g. The Broads Special Area of Conservation ('SAC')/Special Protection Area ('SPA')/Ramsar site) that are sensitive to hydrological and water quality changes (refer to chapter 6 terrestrial biodiversity and chapter 7 freshwater biodiversity for further details).
- Presence of sensitive receptors, including residential communities, surface watercourses (e.g. the River Waveney), groundwater resources, transport infrastructure and utilities. Surface water, groundwater and drainage systems provide hydrological connectivity and potential pathways for contaminant and floodwater migration, with localised flood risk present. Waterbodies are generally at 'moderate' Water Framework Directive ('WFD') [32] status, with existing pressures such as nutrient enrichment and sedimentation (refer to chapter 9 water environment for further details).
- Baseline climate characterised by low rainfall, water stress and exposure to drought, flooding and extreme weather (refer to chapter 16 climate change for further details).
- Potential for historic land use constraints, including contamination sources and the presence of UXO.

### **MA&D Relevance:**

- Potential for fire, explosion or chemical release.

- Structural failure (e.g. reservoir breach).
- Process failure or chemical dosing failure leading to water quality incident affecting public supply.
- Cyber-attack causing loss of control of Supervisory Control and Data Acquisition ('SCADA') systems.
- UXO detonation during construction works.

### Linear Infrastructure

22.4.12 This includes the sections of the EIA Scoping Area for the following components of the Proposed Development:

- Proposed AWRP to River Waveney Pipeline.
- Proposed Barsham Water Treatment Works ('WTW') to CSR Pipeline.
- Proposed CSR to WSR Pipeline.
- Proposed CSR to Saxmundham Pipeline.
- Proposed Saxmundham to SZC Pipeline.
- Proposed Eastern Distribution Mains.
- Proposed Western Distribution Mains.

### Baseline characteristics:

- Numerous crossings of rivers, tributaries and drainage systems (e.g. Waveney, Blyth, Dove, Yox), creating strong hydrological connectivity; watercourses generally at 'moderate' WFD status, subject to existing pressures (refer to chapter 9 water environment for further details).
- Groundwater presence and variable hydrogeological conditions (refer to chapter 9 water environment for further details).
- Interaction with transport corridors, utilities and existing infrastructure.
- Ecological receptors include freshwater species such as fish (including migratory species), macroinvertebrates, macrophytes and diatoms, together with habitats including farmland, woodland, hedgerows, ponds and floodplain grazing marsh, with priority habitats present locally. Ecological and hydrological connectivity along linear features supports species movement, including links to designated ecological sites and other hydrologically connected receptors (refer to chapter 6 terrestrial biodiversity and chapter 7 freshwater biodiversity for further details).
- Presence of historical land uses (e.g. landfill, extraction) representing potential contamination sources, extensive buried infrastructure across variable ground conditions and a generally low UXO risk inland that increases towards coastal areas (refer to chapter 19 ground conditions for further details).

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**MA&D Relevance:**

- Pipeline rupture or uncontrolled leakage.
- Third-party damage leading to pipeline failure.
- Ground instability leading to trench collapse or pipeline failure.
- Release or mobilisation of contamination from contaminated land during excavation, trenching or other ground disturbance activities.
- UXO detonation during construction works.

**Proposed Concentrated Residual Water ('CRW') Disposal Infrastructure (including LSO and onshore connection options)**

22.4.13 Within the proposed LSO component's section of the EIA Scoping Area, potential infrastructure for the disposal of CRW, including offshore and onshore pipeline options and connections, comprising either a proposed LSO or connection to existing outfall infrastructure, would be located. At this scoping stage, all three options for this component, as set out in chapter 2 the Proposed Development, have been considered.

**Baseline Characteristics:**

- Located within a dynamic coastal and marine environment transitioning from freshwater and terrestrial systems to the North Sea, as well as inland environments for the onshore pipeline from the proposed AWRP component to the proposed LSO component.
- Onshore areas include coastal habitats, drainage networks and wetlands hydrologically connected to the Broads.
- Offshore seabed (where applicable) comprises mobile sandy sediments with active bedforms and a gradual offshore slope, reflecting a dynamic coastal system typical of the East Anglian coast.
- Coastal processes are driven by tides, wave action and freshwater-marine interactions, with active sediment transport and dynamic nearshore conditions (refer to chapter 9 water environment for further details).
- Strong connectivity between freshwater inputs, coastal wetlands and the marine environment influences water quality, sediment movement and ecological conditions.
- Presence of designated coastal and estuarine sites within the wider Zol, alongside sensitive habitats such as marshes, lagoons, vegetated shingle and maritime cliffs, and marine ecological receptors including benthic communities (refer to chapter 6 terrestrial biodiversity, chapter 7

freshwater biodiversity and chapter 8 marine biodiversity for further details).

- The coastal environment is influenced by climate drivers including sea level rise, coastal erosion and increased storm intensity (refer to chapter 16 climate change for further details).
- Historical coastal land uses (e.g. landfill) may be present, and elevated UXO risk exists offshore and within intertidal zones due to sediment mobility.

**MA&D Relevance:**

- Structural failure or loss of integrity of the proposed LSO component resulting in significant environmental effects.
- Failure of offshore pipeline installation or connection for the proposed LSO component resulting in loss of control, pollution or obstruction to navigation.
- Major failure of offshore infrastructure arising for the proposed LSO component from seabed instability leading to environmental or safety impacts.
- Major uncontrolled release of drilling fluids, fuels or wastewater to marine or coastal waters during the construction, operational or decommissioning phases for the proposed LSO component.
- UXO detonation during onshore or offshore works.
- Vessel collision with construction plant, temporary works or offshore infrastructure for the proposed LSO components installation, resulting in injury, loss of life or major pollution.

22.4.14 These risks are considered MA&D relevant as they represent low-likelihood but high-consequence events that could result in injury to people or disruption to critical water supply infrastructure and therefore comprising potentially significant effects.

22.4.15 Vessel collision with construction plant, temporary works or offshore infrastructure is proposed to be scoped into the assessment where marine construction activities are required, in connection with the CRW disposal infrastructure. Such events have the potential to result in injury, loss of life or significant pollution incidents. At this stage, all three CRW disposal options are considered and sufficient design information is not yet available to categorically exclude the requirement for offshore or nearshore construction activities. A precautionary approach has therefore been adopted and potential vessel collision risks associated with marine

construction activities have been retained within the scope of the assessment for all three LSO options at this stage. The scope of the assessment will be refined at the ES stage once the preferred option and associated construction methodology will be confirmed.

- 22.4.16 Offshore shipping collision with operational offshore infrastructure associated with any of the CRW disposal options is proposed to be scoped out, as any offshore pipeline or outfall infrastructure would be located on or beneath the seabed and would not protrude into navigable waters. Consequently, no credible vessel collision pathway is anticipated during the operational phase of the Proposed Development.

### UXO – All Sections of the EIA Scoping Area

- 22.4.17 UXO is a potential hazard across all sections of the EIA Scoping Area and has therefore been considered as a risk that will apply to all of the Proposed Development's components within the MA&D assessment.
- 22.4.18 Historical records indicate the potential presence of UXO within the study area, associated with Second World War aerial bombardment and military activity. Potential UXO types include high explosive bombs, artillery projectiles, incendiary devices, small arms ammunition and, offshore, naval ordnance such as mines and torpedoes.
- 22.4.19 These items vary in explosive yield, burial depth and mobility; larger munitions may be deeply buried, while smaller items are typically located at shallow depths. In marine environments, UXO may migrate over time due to tidal and sedimentary processes.
- 22.4.20 The UXO risk varies across the study area, with generally lower risk in inland areas and higher risk in coastal, intertidal and offshore zones. A more detailed description of UXO risk for the components of the Proposed Development is provided in chapter 19 ground conditions.
- 22.4.21 Evidence from historical clearance records and reported discoveries indicates that not all UXO was removed. Although the likelihood of encounter is generally low, the consequences of disturbance can be

significant. UXO therefore represents a low-likelihood, high-consequence hazard and will be considered within the assessment in the major accidents and disasters chapter of the ES.

## Receptors for MA&D

22.4.22 Receptors are features of the environment that may be affected by MA&D and are subject to assessment. Relevant receptors include:

- Terrestrial, freshwater and marine biodiversity.
- Land and soils.
- Water.
- Air and climate.
- Material assets.
- Cultural heritage.
- Landscape.
- Human populations.

22.4.23 These receptors have been identified through a review of base mapping, aerial photography and informed by other ES topics (chapters 6 - 21 of this Scoping Report). Table 22-2 identifies the key receptors within the study area for the Proposed Development.

Table 22-2: Identified Key Receptors for Major Events

| Receptor                                                                                     | Type of Receptor | Description                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Local communities and members of the public, including customers and water consumers.        | Human health.    | Settlements within the study area.                                                                                                                                                                                                                                                                                                                                    |
| Construction workforce and site personnel*, operational staff and decommissioning personnel. | Human health.    | Construction workforce at the proposed AWRP, CSR and WSR components' compounds, and along the proposed pipeline components' routes, exposed to hazards such as UXO, contaminated land, trench collapse, chemical spills and traffic incidents. Operational and maintenance staff may be exposed to chemical spills, equipment failure, fire, explosion, cyber-related |



| Receptor                                                                                                                  | Type of Receptor                                 | Description                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                           |                                                  | operational disruption and traffic incidents. Decommissioning personnel exposed to hazards associated with dismantling, demolition, asset isolation, excavation works, residual contamination and traffic incidents.                                          |
| Surface waters, including water supply sources (River Waveney), Broads National Park and associated ecological receptors. | Water/terrestrial and freshwater biodiversity.   | Sensitive water environment receiving recycled water discharge; designated landscape and ecological receptors.<br>Surface waters, connected habitats and associated ecological receptors potentially affected by pollution, flooding or hydrological changes. |
| Coastal waters and marine users.                                                                                          | Water/marine biodiversity.                       | Marine environment and marine users potentially affected by pollution, marine works, navigation disruption or CRW discharge.                                                                                                                                  |
| Groundwater, aquifers and soils.                                                                                          | Water/land and soil.                             | Underlying geology intersected by reservoir foundations and pipeline trenches. Groundwater resources, aquifers and soils that may be affected by contamination, flooding or ground instability.                                                               |
| Designated ecological sites and biodiversity receptors.                                                                   | Terrestrial, freshwater and marine biodiversity. | SAC/SPA/Ramsar sites within the Zol; protected habitats and species along the proposed pipeline components' routes and near the proposed CSR and WSR components.                                                                                              |
| Cultural heritage assets and archaeology.                                                                                 | Cultural heritage.                               | Designated and non-designated heritage assets within the Zol of the proposed CSR, WSR and pipeline sections of the EIA Scoping Area.                                                                                                                          |
| Landscape receptors.                                                                                                      | Landscape.                                       | Broads National Park and other sensitive landscapes which may be affected by MA&D events.                                                                                                                                                                     |
| Existing water infrastructure for customers and water consumers.                                                          | Material assets.                                 | The existing Lowestoft WRC, Barsham WTW, Lodgewood water tower, Walpole WTW, Saxmundham water tower.                                                                                                                                                          |
| SZC Nuclear Power Station and other critical infrastructure.                                                              | Material assets.                                 | Strategic infrastructure and critical customers connected via pipeline to the Proposed Development;                                                                                                                                                           |



| Receptor                                                                              | Type of Receptor | Description                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                       |                  | requires contingency planning for water supply.                                                                                                                                                                                                                                    |
| Transport network and users.                                                          | Material assets. | Roads, highways, railways and their users affected by construction traffic and abnormal loads within or adjacent to the EIA Scoping Area.                                                                                                                                          |
| Utilities networks.                                                                   | Material assets. | Electricity, telecoms, sewerage, gas/oil and other utility infrastructure.                                                                                                                                                                                                         |
| Proposed Development infrastructure and assets including operational control systems. | Material assets. | Structural failure of the proposed pipelines and above ground infrastructure components may lead to localised or system-wide service disruption and environmental effects.<br>SCADA systems for the proposed AWRP, CSR and WSR components which are vulnerable to cyber incidents. |

*\*Site personnel: engineers, supervisors, environmental specialists, inspectors, client representatives, contractors, visitors and support staff.*

## Assessment Approach

22.4.24 The baseline established in Section 22.4 will be used as part of the assessment of likely significant MA&D effects resulting from the Proposed Development in the ES. The baseline will be kept under review and updated, as appropriate, to reflect the evolving design of the Proposed Development, changes to the baseline environment and the proposed Order Limits. Its role is to:

- Define existing conditions: geology, hydrology, infrastructure vulnerabilities, and environmental sensitivities.
- Identify receptors: communities, ecological sites, cultural heritage, and material assets that could be affected by MA&D scenarios.
- Support hazard pathway validation: confirm whether hazards identified during scoping have credible pathways to receptors.
- Enable scenario development: use baseline data to model realistic construction and operational risk scenarios.

- Inform significance evaluation: ensure that impact assessments are grounded in accurate, site-specific data.

- 22.4.25 The requirement to assess MA&D was introduced into the UK EIA Regulations by amendments made through EU Directive 2014/52/EU [33]. For the Proposed Development, the relevant implementing legislation is The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017). These require consideration of potentially significant effects on the environment arising from the vulnerability of a proposed development to risks of relevant major accidents and/or disasters.
- 22.4.26 It is important to note that the Proposed Development does not fall within the COMAH Regulations 2015, nor is any part of its proposed pipeline components classified as a MAHP, as the Proposed Development does not involve the storage or transport of dangerous substances above the thresholds set out in COMAH Regulations 2015. The Proposed Development transfers only treated wastewater, purified recycled water and drinking water, which are not hazardous substances under the COMAH Regulations 2015 or MAHP definitions. References to COMAH principles and guidance within this chapter are included for contextual and methodological purposes only, reflecting the potential presence of existing COMAH-regulated installations within the vicinity of, or adjacent to, the Proposed Development and its Zol. Such references are used to inform a proportionate assessment of external MA&D scenarios and do not imply that COMAH-type risks, significance criteria or regulatory assessment obligations apply to the Proposed Development itself.
- 22.4.27 Table 22-3 lists the MA&D categories and types to which the Proposed Development may be vulnerable during the construction, operational and decommissioning phases. Hazard categories and types are derived from the ISEP Guidance and cross-checked against Suffolk's Community Risk Register [34] the Norfolk Community Risk Register [35] (where relevant to assets located near or within Norfolk), and the NRR to ensure coverage of

nationally significant risks including terrorism, cyber-attacks, severe weather, floods, pandemics, and infrastructure failures.

Table 22-3: MA&D Categories and Types

| Category                         | Type                                                                                                                                                                                                                                                                                                   |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural                          | Geophysical: <ul style="list-style-type: none"> <li>• Earthquakes</li> <li>• Landslides</li> <li>• Ground subsidence/sinkholes</li> <li>• Tsunamis</li> <li>• Volcanic activity</li> <li>• Avalanche</li> </ul>                                                                                        |
|                                  | Hydrological: <ul style="list-style-type: none"> <li>• Tidal / Coastal Flooding</li> <li>• Fluvial Flooding</li> <li>• Pluvial Flooding</li> <li>• Groundwater Flooding</li> <li>• Reservoirs/dams collapse</li> </ul>                                                                                 |
|                                  | Climatological and Meteorological: <ul style="list-style-type: none"> <li>• Extreme temperature (heat wave, cold snap, heavy snow)</li> <li>• Tropical storms (including cyclones/hurricanes)</li> <li>• High winds / storms</li> <li>• Sandstorms</li> <li>• Wildfires</li> <li>• Droughts</li> </ul> |
|                                  | Biological: <ul style="list-style-type: none"> <li>• Animal/insect infestation</li> <li>• Invasive Non-Native Species ('INNS')</li> </ul>                                                                                                                                                              |
| Technological or Manmade Hazards | Societal: <ul style="list-style-type: none"> <li>• Pandemics and epidemics</li> <li>• Civil unrest, strikes</li> <li>• Large-scale migration or displacement of population</li> <li>• Social care system failures</li> </ul>                                                                           |
|                                  | Malicious Attacks: <ul style="list-style-type: none"> <li>• Terrorism</li> <li>• Chemical, Biological, Radiological and Nuclear ('CBRN')</li> <li>• Sabotage/arson</li> <li>• Cyber-attack</li> </ul>                                                                                                  |

| Category | Type                                                                                                                                                                                                                                   |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | Industrial and Urban Accidents: <ul style="list-style-type: none"> <li>• Explosion</li> <li>• Fire</li> <li>• Technological/industrial accident</li> <li>• Pollution - Spillage of chemicals, oil, accidental contamination</li> </ul> |
|          | Transport accidents: <ul style="list-style-type: none"> <li>• Air, rail, road, maritime/fluvial disaster (crash, derailment, collision, overloading, structural failure of vessel)</li> </ul>                                          |
|          | Utility Failures: <ul style="list-style-type: none"> <li>• Failure of electricity, water, sewage, or communication networks</li> </ul>                                                                                                 |
|          | Engineering Accidents and Failures: <ul style="list-style-type: none"> <li>• Structural or building collapse</li> <li>• Design error</li> <li>• Human error/poor management</li> </ul>                                                 |
|          | Contamination and Ordnance: <ul style="list-style-type: none"> <li>• UXO</li> <li>• Mobilisation of contaminants</li> </ul>                                                                                                            |

## 22.5 Likely Significant Effects

22.5.1 In the context of the MA&D requirements, a “likely significant effect” is an effect that could reasonably occur as a result of a credible hazard pathway and would have a material impact on people, the environment, or infrastructure. The determination of significance considers two key factors:

- Likelihood – whether the event is realistically possible given the nature, scale, and location of the Proposed Development and the UK hazard context. This is informed by sources such as the NRR, the ISEP Guidance, and site-specific data.
- Consequence – the severity of potential outcomes if the event occurs, including risks to human health, environmental receptors, and critical infrastructure. Consequences are assessed in terms of magnitude, duration, and reversibility.

22.5.2 Hazards with a negligible likelihood or consequences that do not meet the threshold for a major accident or disaster, are proposed to be scoped out of the assessment in the major accidents and disasters chapter of the ES.

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Conversely, hazards with credible pathways and significant potential impacts are proposed to be scoped into the assessment in the ES.

- 22.5.3 Based on the Proposed Development and on all collected information presented in Sections 22.1 to 22.4, the likely significant effects set out in Table 22-4 below are proposed to be scoped into the assessment in the major accidents and disasters chapter of the ES.

Table 22-4: Major Event Categories Scoped In

| Major Event Group | Major Event Category | Major Event Type                                    | Justification to Scope Into the ES                                                                                                                                                                                                                                                                                                                                                               | Phase (Construction/ Operational/ Decommissioning) |
|-------------------|----------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Natural Hazards   | Geophysical          | Ground subsidence/ sinkholes                        | Ground conditions (chalk and superficial deposits) present potential for dissolution features; excavation and load changes may trigger localised subsidence; impacts to the proposed pipeline components, the proposed CSR and WSR components' foundations and the proposed AWRP component's structures.                                                                                         | Construction/ Operational/ Decommissioning         |
| Natural Hazards   | Hydrological         | Storm surge/tidal flooding impacting infrastructure | Sections of the proposed AWRP to River Waveney Pipeline located within the River Waveney floodplain and the Broads National Park may be vulnerable to tidal flooding and backwater effects. Marine and estuarine processes relevant to the River Waveney and the proposed LSO component will be considered in the Flood Risk Assessment and the major accidents and disasters chapter of the ES. | Construction/ Operational/ Decommissioning         |
| Natural Hazards   | Hydrological         | Fluvial flooding                                    | Some proposed pipeline components and construction compounds may be located within or cross floodplains. Fluvial flooding                                                                                                                                                                                                                                                                        | Construction/ Operational/ Decommissioning         |

| Major Event Group | Major Event Category              | Major Event Type                                              | Justification to Scope Into the ES                                                                                                                                                                                                                                                                                             | Phase (Construction/ Operational/ Decommissioning) |
|-------------------|-----------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                   |                                   |                                                               | could damage temporary works and permanent assets and trigger secondary events such as pollution incidents, erosion or structural failure.                                                                                                                                                                                     |                                                    |
| Natural Hazards   | Hydrological                      | Pluvial flooding                                              | Heavy rainfall could affect construction compounds and construction areas; surface water management is required; proposed above-ground assets/infrastructure (such as pumping stations, access roads) may be affected; the proposed CSR and WSR components' embankments could be affected if drainage systems are overwhelmed. | Construction/ Operational/ Decommissioning         |
| Natural Hazards   | Hydrological                      | Groundwater flooding                                          | Elevated groundwater levels may cause instability in excavations and buried assets, construction hazards and operational disruption.                                                                                                                                                                                           | Construction/ Operational/ Decommissioning         |
| Natural Hazards   | Climatological and Meteorological | Extreme temperature events (heat wave, cold snap, heavy snow) | Potential to affect workers' safety, construction safety, treatment processes and operational resilience (e.g. power supply, materials performance, chemical storage/dosing efficacy, freezing risks for exposed pipework/valves); heatwaves may affect                                                                        | Construction/ Operational/ Decommissioning         |

| Major Event Group      | Major Event Category              | Major Event Type                    | Justification to Scope Into the ES                                                                                                                                                                                                                                           | Phase (Construction/ Operational/ Decommissioning) |
|------------------------|-----------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                        |                                   |                                     | intake/discharge regimes and water quality; also affects outdoor dismantling/isolations during decommissioning.                                                                                                                                                              |                                                    |
| Natural Hazards        | Climatological and Meteorological | Extreme weather - High winds/storms | Causing failure of temporary works, cranes, scaffolding and exposed structures during construction and decommissioning; operational outages possible.                                                                                                                        | Construction/ Operational/ Decommissioning         |
| Natural Hazards        | Hydrological                      | Reservoirs/uncontrolled release     | Failure of the proposed CSR and WSR components could cause significant downstream flooding, environmental damage and significant water supply disruption; discontinuance/abandonment pathways during decommissioning.                                                        | Operational/ Decommissioning                       |
| Technological/ Manmade | Malicious Attacks                 | Terrorism                           | Low likelihood but high consequence for critical water infrastructure. Potential targeting of the proposed AWRP, CSR and WSR components, or control systems and interfaces (including SZC supply), resulting in major service disruption, damages and environmental effects. | Operational/ Decommissioning                       |
| Technological/ Manmade | Malicious Attacks                 | CBRN                                | Low likelihood; consequence potentially severe for potable water                                                                                                                                                                                                             | Operational/ Decommissioning                       |



| Major Event Group      | Major Event Category           | Major Event Type | Justification to Scope Into the ES                                                                                                                                                                                                              | Phase (Construction/ Operational/ Decommissioning) |
|------------------------|--------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                        |                                |                  | systems, water quality and public health - scoped into the ES to consider the vulnerability of the Proposed Development and relevant resilience and contingency planning measures.                                                              |                                                    |
| Technological/ Manmade | Malicious Attacks              | Sabotage/arson   | Credible risk to construction compounds, chemical storage, dosing systems and temporary facilities, leading to fire, pollution or service disruption; perimeter/security measures and monitoring required.                                      | Construction/ Operational/ Decommissioning         |
| Technological/ Manmade | Malicious Attacks              | Cyber-attack     | SCADA and telemetry for the proposed AWRP, CSR, WSR components and pumping station subsidiary component vulnerable to cyber incidents; risks to process control, data integrity, service continuity, contamination incidents and SZC interface. | Operational                                        |
| Technological/ Manmade | Industrial and Urban Accidents | Explosion        | Chemical storage (e.g. sodium hypochlorite, acids), dosing systems and pressurised equipment present fire/explosion potential, including during plant isolation/decontamination at decommissioning. Fire at construction compounds or           | Construction/ Operational/ Decommissioning         |

| Major Event Group      | Major Event Category           | Major Event Type                                                    | Justification to Scope Into the ES                                                                                                                                                                                                                                                                                                                                                                         | Phase (Construction/ Operational/ Decommissioning) |
|------------------------|--------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                        |                                |                                                                     | proposed AWRP component leading to infrastructure damage, pollution or safety risks.                                                                                                                                                                                                                                                                                                                       |                                                    |
| Technological/ Manmade | Industrial and Urban Accidents | Fire                                                                | Potential fire risk associated with chemicals, fuels and infrastructure at the proposed AWRP component, and construction compound areas may result in major damage; requires passive/active fire protection, emergency response planning and training.                                                                                                                                                     | Construction/ Operational/ Decommissioning         |
| Technological/ Manmade | Industrial and Urban Accidents | Major process or equipment failure leading to operational incident. | Process upset or equipment failure could lead to significant impacts (incorrect chemical dosing, leading to water quality issues or hazardous reactions; pump or valve malfunction causing uncontrolled flows; breakdown of dosing systems, pressurized vessels or control systems could lead to chemical release, environmental contamination (including marine contamination), or operational shutdown). | Operational/ Decommissioning                       |
| Technological/ Manmade | Industrial and Urban Accidents | Pollution – major operational chemical spill (process-related       | Accidental release of hazardous substances during handling or transport at the proposed AWRP component could result in significant                                                                                                                                                                                                                                                                         | Construction/ Operational/ Decommissioning         |

| Major Event Group      | Major Event Category           | Major Event Type                                                                                                                                      | Justification to Scope Into the ES                                                                                                                                                                                                                                        | Phase (Construction/ Operational/ Decommissioning) |
|------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                        |                                | accidental contamination).                                                                                                                            | contamination of land or water, with potential consequences for public health, environmental receptors, regulatory compliance and continuity of water supply services.                                                                                                    |                                                    |
| Technological/ Manmade | Industrial and Urban Accidents | Major construction-phase spill (fuels, lubricants, hydraulics, admixtures, sealants) with potential to cause significant environmental contamination. | Construction activities may give rise to significant spills of fuels or materials with potential to cause widespread environmental contamination (including marine contamination) and require emergency response.                                                         | Construction/ Decommissioning                      |
| Technological/ Manmade | Industrial and Urban Accidents | SZA (decommissioning nuclear power station) and SZB (operational nuclear power station - pressurised water reactor) radiation.                        | Accidental radiological release arising from reactor malfunction (SZB), or decommissioning incident (SZA), or from external hazard affecting site (e.g. extreme event); the risk is externally controlled, of very low likelihood, but with potentially high consequence. | Construction/ Operational/ Decommissioning         |
| Technological/ Manmade | Transport Accidents            | Road/rail/marine/ fluvial collisions                                                                                                                  | Movement of heavy plant, abnormal loads, and chemical deliveries increases collision risk on major roads/rail crossings; marine activities for the proposed LSO                                                                                                           | Construction/ Decommissioning                      |

| Major Event Group      | Major Event Category               | Major Event Type                                               | Justification to Scope Into the ES                                                                                                                                                                                                                                                                            | Phase (Construction/ Operational/ Decommissioning) |
|------------------------|------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                        |                                    |                                                                | component interfacing with coastal waters and navigation.                                                                                                                                                                                                                                                     |                                                    |
| Technological/ Manmade | Transport Accidents                | Marine vessel collision with infrastructure.                   | Collision between vessel and construction plant, temporary works or offshore infrastructure causing injury, pollution or navigation hazard.                                                                                                                                                                   | Construction                                       |
| Technological/ Manmade | Utility Failures                   | Loss of electricity, water, sewage, or communication networks. | Loss of utilities could disrupt the proposed AWRP, CSR and WSR components' operations leading to service disruption or environmental incidents; resilience measures (backup power, telemetry redundancy) necessary; cascading impacts to SZC supply.                                                          | Operational / Decommissioning                      |
| Technological/ Manmade | Engineering Accidents and Failures | Structural failure of reservoirs, or infrastructure.           | Structural failures at the proposed WSR and CSR components' embankments, the proposed pipeline components, or other proposed components could cause flooding, service outage, and environmental harm; heightened consequence due to potable supply role; temporary works during decommissioning need control. | Operational/ Decommissioning                       |
| Technological/ Manmade | Engineering Accidents and Failures | Trench collapse or excavation failure.                         | Excavation for the proposed CSR and WSR components and trenching for the proposed pipeline                                                                                                                                                                                                                    | Construction/ Decommissioning                      |

| Major Event Group      | Major Event Category               | Major Event Type                                                                                      | Justification to Scope Into the ES                                                                                                                                                                                                                                                                             | Phase (Construction/ Operational/ Decommissioning) |
|------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                        |                                    |                                                                                                       | components could create temporary slopes that may fail under certain conditions (weak soils, water ingress) with consequences on workers' safety, infrastructure and adjacent properties damage, and delays.                                                                                                   |                                                    |
| Technological/ Manmade | Engineering Accidents and Failures | Infrastructure failure because of design error.                                                       | Design defects may result in structural or operational failure of infrastructure if not properly controlled through assurance processes.                                                                                                                                                                       | Construction/ Decommissioning                      |
| Technological/ Manmade | Engineering Accidents and Failures | HDD failure (frac-out release).                                                                       | Drilling operations may result in bore collapse or inadvertent drilling fluid release (frac-out), particularly in sensitive marine and coastal environments, resulting in significant pollution of ground or marine environment                                                                                | Construction                                       |
| Technological/ Manmade | Engineering Accidents and Failures | Failure or loss of integrity of the proposed LSO component due to seabed mobility (where applicable). | Seabed processes may destabilise offshore pipeline or outfall infrastructure associated with CRW disposal options involving marine or nearshore works, resulting in damage, loss of function, system failure and potential environmental impacts. As all three CRW disposal options remain under consideration | Construction/ Operational                          |

| Major Event Group      | Major Event Category     | Major Event Type                                                       | Justification to Scope Into the ES                                                                                                                                                                                                                                                                                                              | Phase (Construction/ Operational/ Decommissioning) |
|------------------------|--------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
|                        |                          |                                                                        | and the need for offshore or nearshore works has not yet been confirmed, a precautionary approach has been adopted, and this hazard has been retained within the scope of the assessment for all three LSO options. The scope will be refined at the ES stage once the preferred option and associated design requirements have been confirmed. |                                                    |
| Technological/ Manmade | Contamination / Ordnance | UXO detonation during excavation or marine works.                      | Possible encounter detonation during excavation or marine works presents a low-likelihood but very high-consequence risk, resulting in potential fatality, serious injury and significant environmental or infrastructure impact.                                                                                                               | Construction/ Decommissioning                      |
| Technological/ Manmade | Contamination            | Mobilisation of contaminants from contaminated land during excavation. | Excavation may release contaminants into groundwater or surface water, causing environmental and health impacts.                                                                                                                                                                                                                                | Construction/ Decommissioning                      |

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## 22.6 Impacts Scoped Out of the Assessment

- 22.6.1 Based on the Proposed Development and on the information presented in Sections 22.1 to 22.4, the following likely significant effects are proposed to be scoped out of the assessment in the major accidents and disasters chapter of the ES, as set out in Table 22-5 below.

Table 22-5: Major Event Categories Proposed to be Scoped Out of the ES

| Major Event Group | Major Event Category              | Major Event Type                                | Justification for Scoping Out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|-----------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural Hazards   | Geophysical                       | Earthquakes                                     | UK seismicity is very low in the study area according to BGS data; significant earthquakes in the UK are rare, and an earthquake powerful enough to inflict severe damage is unlikely, according to NRR 2025.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Natural Hazards   | Geophysical                       | Landslides                                      | The study area is generally flat with gently undulating land; BGS data indicates negligible landslide risk.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Natural Hazards   | Geophysical                       | Tsunamis/tidal waves                            | The UK coastline is not located within a tsunami-prone region and the risk of a tsunami affecting the North Sea is extremely low. Coastal configuration and bathymetry further reduce the likelihood of a credible tsunami or tidal wave affecting the Proposed Development. As all three LSO options remain under consideration at this stage, a precautionary approach has been adopted in relation to option selection; however, tsunami and tidal wave events are not considered to represent a credible major accident or disaster risk to the Proposed Development and are therefore proposed to be scoped out of the assessment. |
| Natural Hazards   | Geophysical                       | Volcanic activity                               | No volcanic risk in the UK; ash clouds from Iceland's volcanic eruptions are unlikely to affect the Proposed Development.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Natural Hazards   | Geophysical                       | Avalanche                                       | Not applicable in UK lowland eastern geography; no mountainous terrain within the study area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Natural Hazards   | Climatological and Meteorological | Tropical storms (including cyclones/hurricanes) | Tropical cyclones do not occur in the UK; relevant storm risks are captured under extreme weather events proposed to be scoped into the assessment in the major accidents and disasters ES chapter.                                                                                                                                                                                                                                                                                                                                                                                                                                     |



| Major Event Group      | Major Event Category              | Major Event Type                                    | Justification for Scoping Out                                                                                                                                                                                                                                   |
|------------------------|-----------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural Hazards        | Climatological and Meteorological | Sandstorms                                          | Not relevant in UK climate.                                                                                                                                                                                                                                     |
| Natural Hazards        | Climatological and Meteorological | Wildfires                                           | Low likelihood in East Anglia; minor risk near dry grasslands during drought; heath/grass fires present limited fuel continuity, moisture content is higher than in arid climates and landscape fragmentation (fields, roads, hedgerows) breaks up fire spread. |
| Natural Hazards        | Climatological and Meteorological | Droughts                                            | Part of the Proposed Development's purpose is to increase drought resilience; drought does not present an accident/disaster scenario, managed through strategic water resource planning, not through the assessment of MA&D risk.                               |
| Biological             | Biological                        | Animal/insect infestation                           | Minor relevance; could affect construction compounds but not a MA&D risk.                                                                                                                                                                                       |
| Biological             | Biological                        | INNS                                                | Relevant for biodiversity, but not for MA&D risk assessment. Does not create a credible pathway for a major accident or disaster involving the Proposed Development's components.                                                                               |
| Technological/ Manmade | Societal                          | Pandemics and epidemics                             | Primary effects are workforce availability and logistics; no direct major-accident pathway to assets. Managed under corporate procedures/business continuity planning; not project-specific MA&D risk.                                                          |
| Technological/ Manmade | Societal                          | Large-scale migration or displacement of population | Outside MA&D scope because it is a socio-economic consideration, not an accident/disaster consideration for the Proposed Development.                                                                                                                           |
| Technological/ Manmade | Societal                          | Social care system failures                         | Proposed to be scoped out of the assessment in the ES because it is a governance/service delivery issue, not a hazard to physical infrastructure. Social care and system failures affect                                                                        |

| Major Event Group         | Major Event Category               | Major Event Type                                                  | Justification for Scoping Out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------|------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |                                    |                                                                   | societal resilience, not infrastructure safety or operational continuity in a way that triggers catastrophic events.                                                                                                                                                                                                                                                                                                                                                                                         |
| Technological/<br>Manmade | Societal                           | Civil unrest, strikes                                             | Potential to delay works or disrupt workforce availability but not create environmental accident scenarios.<br>Low likelihood; may disrupt construction activities and delay emergency response. Contingency planning measures are included in Contractor's construction-stage management arrangements/plans and the Applicant's operational continuity and emergency response procedures.                                                                                                                   |
| Technological/<br>Manmade | Aviation                           | Aircraft crash onto assets                                        | Extremely low likelihood given asset locations outside flight paths/airfields; no historical precedent indicating credible pathway.                                                                                                                                                                                                                                                                                                                                                                          |
| Technological/<br>Manmade | Maritime                           | Offshore shipping collision unrelated to the Proposed Development | Where offshore or nearshore works are required, maritime navigation risks would be assessed through a Navigation Risk Assessment submitted in support of the DCO application and managed through appropriate maritime controls during construction. No credible pathway for offshore shipping collision unrelated to the Proposed Development is anticipated during operation, as any completed offshore infrastructure would be located on or beneath the seabed and would not present a navigation hazard. |
| Technological/<br>Manmade | Engineering Accidents and Failures | Structural or building collapse during dismantling                | It is controlled by standard demolition risk management, not an unpredictable disaster scenario.                                                                                                                                                                                                                                                                                                                                                                                                             |

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## 22.7 Proposed Approach to Mitigation

- 22.7.1 The Proposed Development incorporates a range of measures to prevent, reduce, and offset significant adverse effects associated with MA&D risks. These measures are aligned with industry best practice, regulatory requirements, and resilience principles for critical water infrastructure.
- 22.7.2 Mitigation measures will follow the ISEP Guidance.

### Primary (Inherent) Mitigation

- Site selection and layout: the proposed AWRP, CSR and WSR components of the Proposed Development will be located outside high flood risk zones, where practicable; the pipeline components' alignments will avoid sensitive ecological sites and cultural heritage assets, where practicable.
- Engineering design standards: the proposed CSR and WSR components' embankments and the proposed pipeline components will be designed to withstand rare seismic events and ground settlement; structural integrity verified through geotechnical investigations.
- Process resilience: SCADA systems with cybersecurity hardening; dual power feeds and backup generators for the proposed AWRP, CSR and WSR components; chemical storage in bunded areas with spill containment will be implemented.
- Flood resilience: the Proposed Development's finished floor levels for the above ground components will be above predicted fluvial/pluvial flood levels; drainage systems will be designed to account for extreme rainfall events.
- Environmental protection: the LSO component of the Proposed Development will be designed to meet discharge standards.

### Secondary (Foreseeable) Mitigation

- Construction phase mitigation measures:
  - UXO surveys and remediation (if required) before excavation.
  - Temporary works designed for wind loading and slope stability, monitoring during heavy rainfall.
  - Implementation of measures set out in Construction Traffic Management Plans ('CTMP') for abnormal loads and chemical deliveries, in line with the Outline Construction Traffic Management Plan ('OCTMP') to be submitted in support of the DCO application; co-ordination with highways authorities.
- Operational phase mitigation measures:

- Emergency response plans for the CSR and WSR components' failure, chemical spills, and cyber incidents.
- Contingency water supply arrangements for SZC and critical customers.
- Enhanced security measures (perimeter fencing, CCTV, access control) to deter sabotage/arson.
- Decommissioning phase mitigation measures:
  - Safe isolation and removal of chemicals and fuels before dismantling to avoid spills and potential hazards.
  - Drain-down and neutralisation of pipelines, tanks, and process equipment to prevent accidental releases during cutting or removal.
  - Stability controls during dismantling, such as controlled lifting operations, and temporary supports to avoid structural collapse.
  - Traffic and access management for abnormal loads, heavy plant removal and temporary road closures, co-ordinated with local authorities.
  - Maintaining security during decommissioning, including fencing and surveillance, to deter unauthorised access, theft, vandalism or arson.

### **Tertiary (Inexorable) Mitigation - Construction and Operational Phases**

- Pollution prevention: adherence to CIRIA guidance for spill response; bunding and drip trays for plant and chemical storage.
- Legislative compliance: COMAH principles for chemical storage; cyber resilience aligned with Network and Information Systems ('NIS') Regulations.
- Routine maintenance and inspection: scheduled checks for pipelines, valves, and embankments; SCADA system patching and redundancy testing.
- Water quality monitoring at the Proposed Development's discharge point into the River Waveney and the proposed LSO component's discharge of CRW into the North Sea; adaptive management if thresholds approached.

### **Tertiary (inexorable) Mitigation - Decommissioning Phase**

- Pollution prevention and waste control: controlled drain-down and flushing of pipelines, tanks and process units; sediment/silt management to protect watercourses; compliant segregation and storage of any demolition arisings; duty-of-care compliance for all waste transfers; and spill containment for residual oils, fuels or chemicals.
- Environmental protection: measures to avoid habitat disturbance during dismantling; adherence to ecological timing restrictions; dust suppression; lighting management; and noise mitigation.

- Removal of assets and reinstatement: safe removal of above- and below-ground infrastructure; appropriate backfilling and void treatment; validation of contamination clean-up; reinstatement of ground profiles; soil stabilisation; and restoration or reseeding to pre-existing land use or agreed landscape requirements.
- Cyber and data resilience on decommissioning: secure shutdown and retirement of SCADA, telemetry and communications systems; revocation of all remote access rights and credentials; WEEE-compliant disposal of electronic components.
- Monitoring and verification: post-decommissioning inspections including validation surveys to confirm the absence of contamination.

22.7.3 These measures collectively address The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) requirement for describing actions to prevent, reduce, and offset significant adverse effects.

## 22.8 Proposed Approach to the ES

### Assessment Methodology

22.8.1 The proposed baseline data collection methods for the major accidents and disasters chapter of the ES are detailed in Section 22.4.

22.8.2 The major accidents and disasters chapter of the ES will assess MA&D risks using a structured, risk-based methodology aligned with the ISEP Guidance and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017). The process will:

- Develop credible scenarios for natural, technological, and malicious hazards.
- Apply source–pathway–receptor analysis for all scoped-in hazards.
- Assess the Proposed Development’s construction, operational and decommissioning phases, applying a *‘cautious ‘worst case’ approach’* in line with the principle of the ‘Rochdale Envelope’ and in accordance with the Planning Inspectorate’s NSIPs: Pre-Application Advice on Environmental Impact Assessment.

- Consider cumulative and in-combination effects (e.g. flooding combined with cyber-attack or utility failure).
- Integrate stakeholder engagement responses (e.g. EA, Local Resilience Forums, SZC operators).
- Document limitations, including data gaps and predictive uncertainties.
- Use a qualitative risk matrix (likelihood × consequence/severity) to evaluate significance.
- Apply the “As Low as Reasonably Practicable” (‘ALARP’) principle to residual risks after primary mitigation.

### Best Practice Guidance

- The ISEP Guidance.
- The NRR.
- COMAH Regulations and relevant HSE guidance.

### Significance of Effect

22.8.3 Significance will be determined using a qualitative judgement based on:

- Receptor sensitivity (adaptability, tolerance, recoverability).
- Magnitude of impact (extent, duration, frequency and severity).
- Likelihood of the ‘*cautious ‘worst case’*’ outcome, after primary mitigation.

22.8.4 The significance of an effect/impact will be determined using the below tables for the receptor sensitivity, magnitude of impact and likelihood of the event.

22.8.5 Effects will be considered significant if they combine a high severity (consequence), with medium/high likelihood or trigger any regulatory thresholds.

22.8.6 A risk event will generally be considered significant where:

- The ‘*cautious ‘worst case’*’ could result in loss of life, permanent injury or permanent/long-term environmental damage.
- Effects extend beyond the proposed Order Limits.
- Substantial emergency response mobilisation would be required.
- Relevant regulatory thresholds may be exceeded.

- 22.8.7 Where tertiary mitigation measures (good practice controls) and primary mitigation measures reduce likelihood and consequence to ALARP, effects are typically not significant.

## Sensitivity of Receptors

Table 22-6: Receptor Sensitivity

| Sensitivity | Criteria                                                                                                                                                         |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High        | Critical infrastructure with no redundancy or limited contingency (e.g. main reservoirs); failure could cause widespread disruption or major environmental harm. |
| Moderate    | Infrastructure with some resilience or backup systems (e.g. secondary distribution pipelines, pumping stations with standby capacity).                           |
| Low         | Non-critical assets with strong resilience or readily available alternatives; limited consequences if affected.                                                  |

## Magnitude of Impact

Table 22-7: Impact Magnitude

| Magnitude | Criteria                                                                                                                                         |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| High      | Catastrophic failure of reservoirs or major pipelines; widespread service disruption; severe environmental harm; major recovery effort required. |
| Medium    | Localised damage requiring major repair; temporary or localised service interruption; moderate environmental impact.                             |
| Low       | Minor, easily repairable damage; minimal disruption; short-term impacts.                                                                         |
| Very Low  | Negligible consequence; superficial impacts with no effect on safety, environmental receptors, infrastructure integrity, or service continuity.  |

## Likelihood

- 22.8.8 The consideration of likelihood is based on historical data, predictive modelling, and professional judgement; it is an additional step applied to determine if an effect is significant.

Table 22-8: Likelihood Scale

| Likelihood                | Criteria                                                                                                                                                    |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High/More likely          | The event has occurred repeatedly in similar systems or is expected to occur during the asset lifecycle; strong evidence from modelling or historical data. |
| Medium/Possible           | The event is plausible and has occurred occasionally in comparable assets; moderate supporting evidence.                                                    |
| Low/Unlikely but credible | The event is unlikely but possible; limited historical evidence or weak supporting data.                                                                    |
| Very Low/Highly unlikely  | The event is highly improbable; no known historical occurrences and minimal modelled probability.                                                           |

## Mitigation and Residual Effects

- 22.8.9 The major accidents and disasters chapter of the ES will evaluate MA&D risks taking into account all committed primary (embedded), secondary (foreseeable) and tertiary (good practice/regulatory) mitigation measures set out in Section 22.7. Assumptions regarding the implementation and effectiveness of these measures will be described in the Assessment Methodology; for assessment purposes, it will be assumed that committed mitigation is delivered as designed, in line with standard EIA practice and the ISEP Guidelines. The assessment will consider how embedded and regulatory controls reduce the likelihood and/or consequence of each ‘cautious ‘worst case’ risk event, and whether risks are managed to a level that is ALARP.
- 22.8.10 Residual effects will represent the remaining risk after all committed mitigation has been considered and will be judged qualitatively based on whether the ‘cautious ‘worst case’ outcome, after embedded controls, could still constitute a major accident or disaster (e.g. permanent injury, loss of life or irreversible environmental harm). Where embedded and good practice controls reduce risks to ALARP, significant residual MA&D effects are not expected; where additional measures are required, these will be identified and set out in the major accidents and disasters chapter of the ES.



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## In-combination Effects

22.8.11 The major accidents and disasters chapter of the ES will assess in-combination effects, which occur when multiple hazards or environmental factors interact to create a greater impact on a single receptor than each would individually. This includes both simultaneous events and cascading downstream effects.

### Potential In-combination Scenarios

- The proposed CSR and WSR components' failure combined with flooding and hazardous material spill, affecting local communities and strategic infrastructure such as SZC operations.
- Cyber-attack combined with utility failure, disrupting water supply to SZC and local distribution networks.
- Subsidence combined with pipeline rupture and contamination, impacting sensitive receptors such as groundwater and designated ecological sites.
- Extreme weather combined with construction-phase risks, such as high winds damaging temporary works while heavy rainfall increases spill risk.

### In-combination Receptor Examples

- Residential areas: combined effects of flooding, chemical spill, and emergency access constraints.
- Ecological sites: combined effects of water quality changes and habitat disturbance.
- Critical infrastructure: combined effects of utility failure and sabotage impacting water supply continuity.

### Downstream Effects

22.8.12 The ES will also consider secondary or cascading impacts, such as:

- Proposed CSR and WSR components' failure leading to downstream flooding and contamination.
- Utility failure causing operational shutdown and emergency water supply demand.

### Assessment Approach

- Apply source–pathway–receptor analysis for combined hazards.
- Use a qualitative risk matrix to evaluate combined likelihood and consequence.

- Consider mitigation overlap (e.g., flood resilience measures reducing chemical spill risk).

## Limitations and Assumptions

22.8.13 The limitations and assumptions at this scoping stage consist of:

- The identification of potential effects does not rely on detailed design development or project-specific mitigation, as these are not fully defined at this scoping stage; however, it assumes the application of standard good practice, regulatory compliance and embedded design principles in line with best practice.
- Reliance on desk-based data: the scoping assessment is based primarily on published datasets (EA flood maps, BGS geology, HSE hazardous installations, COMAH registers). Site-specific surveys will be undertaken for the proposed Order Limits, where relevant, to inform the assessment in ES and validate these assumptions.
- Climate projection uncertainty: extreme weather scenarios are informed by UK Climate Projections ('UKCP') [36], which carry inherent uncertainty regarding frequency and severity of future events.
- UXO risk based on historical records: UXO risk is currently assessed using historical mapping and records; physical verification will be required during pre-construction surveys.
- Design evolution: the locations and layouts of the Proposed Development's components are subject to refinement at which may influence hazard pathways and receptor proximity.
- Operational data availability: some resilience measures (e.g., SCADA cybersecurity protocols) will be confirmed during detailed design and may affect risk ratings.
- Changes to the hydrological regime arising from the normal operation of the Proposed Development are not expected to constitute a MA&D and will be assessed, where relevant, within the Water Environment chapter. However, hydrological changes associated with credible MA&D scenarios, including reservoir failure, pipeline rupture, uncontrolled releases and flooding events, will be considered within the MA&D assessment.

## 22.9 Summary of Impacts and Effects

22.9.1 Table 22-9 provides a summary of the receptors, potentially significant effects, anticipated magnitude, sensitivity, significance and whether the receptor/effect is scoped into or out of the assessment in the major accidents and disasters chapter of the ES for the construction, operational and decommissioning phases of the Proposed Development.

Table 22-9: Summary of Major Accidents and Disasters Scope

| Receptor                                                                                                                                                                           | Effects                                                                                                                                                                                                                                                                      | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                        | Scoped in/Scoped out (for assessment) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>Construction Phase</b>                                                                                                                                                          |                                                                                                                                                                                                                                                                              |                       |                                    |                                                |                                                                                                                                                                                                                                                                                   |                                       |
| Construction workforce, and site personnel; local communities and members of the public; transport and utilities networks; designated ecological sites and biodiversity receptors. | Major ground failure (including trench collapse or subsidence/sinkholes) leading to injury or fatality of on-site and off-site receptors and potential off-site impacts including damage to adjacent land, infrastructure (e.g. utilities, highways) and risk to the public. | Medium - High         | High                               | Significant                                    | Site layout and geotechnical design to tolerate settlement; slopes/benches to design.<br>Temporary works designed for slope stability and wind loading; dewatering and rainfall-trigger monitoring.<br>Independent assurance of safety-critical earthworks; governance oversight. | Scoped in                             |
| Construction workforce and site personnel; local communities and members of the public; infrastructure; surface waters                                                             | Severe injury or fatality from UXO detonation during excavation.                                                                                                                                                                                                             | High                  | High                               | Significant                                    | Pre-construction UXO risk assessment, desk study, surveys and remediation prior to excavation; stop-work and escalation procedures.                                                                                                                                               | Scoped in                             |

| Receptor                                                                                                                                                                                            | Effects                                                                                                     | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                          | Scoped in/Scoped out (for assessment) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| and associated ecological receptors; designated ecological sites and biodiversity receptors.                                                                                                        |                                                                                                             |                       |                                    |                                                | Governance and assurance of UXO risk management (specialist supervision).                                                                                           |                                       |
| Construction workforce and site personnel; local communities and members of the public; surface waters and associated ecological receptors; designated ecological sites and biodiversity receptors. | Exposure to external hazards, including very low likelihood external radiological release from SZA and SZC. | High                  | High                               | Significant                                    | Emergency planning, coordination with relevant authorities and awareness of off-site risk registers. Multi-agency emergency preparedness and response arrangements. | Scoped in                             |
| Transport network and users (public along routes).                                                                                                                                                  | Major road/rail collision involving construction traffic, abnormal loads and/or chemical deliveries         | Medium                | Moderate - High                    | Significant                                    | CTMP in accordance with the OCTMP; agreed routes and delivery controls for abnormal loads and                                                                       | Scoped in                             |

| Receptor                                                                                                          | Effects                                                                                                                               | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                         | Scoped in/Scoped out (for assessment) |
|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|                                                                                                                   | causing injury, fatalities or secondary pollution.                                                                                    |                       |                                    |                                                | chemicals; driver competence.<br>Liaison with highways authorities; incident reporting and review.                                                                                                                 |                                       |
| Surface waters (River Waveney)                                                                                    | Siltation and pollution from pluvial/fluviat flooding of works; inundation of temporary facilities.                                   | Medium–High           | High                               | Significant                                    | Platform levels and temporary drainage sized for extreme rainfall.<br>Weather-triggered controls, temporary barriers and pumps.<br>Maintenance of drains and post-event inspections; pollution response procedures | Scoped in                             |
| Surface waters and associated ecological receptors; groundwater, aquifers and soils; designated ecological sites. | Significant contamination and fire hazard from major uncontrolled construction spills (diesel, hydraulic oils, admixtures, sealants). | Medium                | Moderate-High                      | Significant                                    | Bunded storage, designated refuelling, spill containment.<br>Spill kits, trained responders and emergency procedures.<br>Pollution prevention good practice; incident                                              | Scoped in                             |

| Receptor                                                                                                                                        | Effects                                                                                                                                                                               | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                | Scoped in/Scoped out (for assessment) |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| and biodiversity receptors.                                                                                                                     |                                                                                                                                                                                       |                       |                                    |                                                | investigation; routine inspections (CIRIA Guidance adherence).                                                                                                                                            |                                       |
| Local communities and members of the public, Construction workforce and site personnel, designated ecological sites and biodiversity receptors. | Fire or explosion at compounds or temporary chemical storage areas causing injury, damage and environmental impact.                                                                   | Medium-High           | High                               | Significant                                    | Segregated and compatible storage; passive and active fire protection. Emergency response plans and drills. Inspection, maintenance and assurance of fire safety systems.                                 | Scoped in                             |
| Coastal waters and marine users; proposed development infrastructure and assets.                                                                | Injury, pollution and navigation disruption from marine vessel collision with temporary works associated with the LSO options where marine construction activities are required.<br>. | Medium                | Moderate-High                      | Significant                                    | Marine coordination; procedures, including vessel movement planning, real-time communication with harbour/master authorities, implementation of exclusion zones, and compliance with notices to mariners; | Scoped in                             |

| Receptor                         | Effects                                                                                                                                                                                                                                                                        | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                        | Scoped in/Scoped out (for assessment) |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|                                  |                                                                                                                                                                                                                                                                                |                       |                                    |                                                | vessel traffic management plans.<br>Liaison with harbour/master authorities and incident reporting procedures.    |                                       |
| Coastal waters and marine users. | Major uncontrolled release of drilling fluids during HDD failure (frac-out or bore instability) causing significant marine or transitional water pollution. This impact is relevant to any LSO option where HDD or similar trenchless construction techniques may be required. | Medium                | High                               | Significant                                    | HDD design and ground investigation monitoring and containment procedures.<br>Emergency response and remediation. | Scoped in                             |

| Receptor                                                                                                                     | Effects                                                                                                 | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                         | Scoped in/Scoped out (for assessment) |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>Operational Phase</b>                                                                                                     |                                                                                                         |                       |                                    |                                                |                                                                                                                                                                                                                                    |                                       |
| Local communities and members of the public downstream.                                                                      | Rapid inundation, risk to life and property, major supply disruption from reservoir/embankment failure. | High                  | High                               | Significant                                    | Design to standards with geotechnical verification.<br>Proposed CSR and WSR components' failure emergency plans and exercises.<br>Reservoirs Act compliance; scheduled inspections/maintenance.                                    | Scoped in                             |
| Local communities and members of the public, including customers and water consumers; SZC and other critical infrastructure. | Loss of supply or degraded water quality from major cascading utility failures and process upsets.      | Medium - High         | High                               | Significant                                    | Multiple independent supply sources and interconnections; treatment process redundancy and segregation; protected power resilience for critical assets; preferential supply arrangements for critical customers where practicable. | Scoped in                             |



| Receptor                                                                              | Effects                                                                                                  | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                                       | Scoped in/Scoped out (for assessment) |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|                                                                                       |                                                                                                          |                       |                                     |                                                | Contingency water supply arrangements; business continuity and incident response plans; automatic changeover and isolation systems; prioritisation protocols for critical customers. Routine testing of resilience and emergency arrangements; independent assurance of critical customer supply resilience; ongoing asset maintenance and governance oversight. |                                       |
| Local communities and members of the public, including customers and water consumers. | Non-compliance and potential health risk from chemical spills or incorrect dosing; service interruption. | Medium - High         | High                                | Significant                                    | Bunded and segregated chemical storage; engineered interlocks. Emergency spill and dosing incident plans;                                                                                                                                                                                                                                                        | Scoped in                             |

| Receptor                                                            | Effects                                                                                                                                                                                                                                                                                                                                                                                     | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                                                                                                                                                           | Scoped in/Scoped out (for assessment) |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                             |                       |                                    |                                                | operator competence and supervision.<br>CIRIA good practice; audits and inspections.                                                                                                                                                                                                                                                                 |                                       |
| Surface waters (River Waveney) and coastal waters and marine users. | Flooding of the Proposed Development's components, uncontrolled discharges or ecological impacts from storm surge/tidal and fluvial/pluvial flooding, associated with recycled water discharge via the proposed discharge point into the River Waveney and CRW discharge to the North Sea under Option 1 (new offshore LSO), Option 2 (existing Lowestoft WRC outfall network), or Option 3 | Medium - High         | High                               | Significant                                    | Finished floor levels above predicted flood levels; drainage capacity for extremes; compliant marine outfall design for the proposed LSO component.<br>Adaptive operations during severe weather.<br>Inspections and drainage maintenance; monitoring at the proposed River Waveney outfall and the proposed LSO component with adaptive management. | Scoped in                             |

| Receptor                                                                                                                                    | Effects                                                                                        | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                                                                              | Scoped in/Scoped out (for assessment) |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|                                                                                                                                             | (connection to the existing outfall structure).                                                |                       |                                    |                                                |                                                                                                                                                                                                                         |                                       |
| Proposed Development (proposed AWRP, CSR, WSR) infrastructure and assets (pumping stations components & SCADA operational control systems). | Loss of control, data integrity, and service continuity because of cyber-attack.               | Medium - High         | High                               | Significant                                    | Secure-by-design SCADA architecture and network segregation.<br>Cyber incident response with tested backup/recovery arrangements.<br>Alignment with NIS Regulations; patching schedule and periodic resilience testing. | Scoped in                             |
| All identified receptors (Table 22-3).                                                                                                      | Damage, service disruption, potential contamination because of sabotage/arson; terrorism/CBRN. | High                  | High                               | Significant                                    | Secure by design layout and zonation.<br>Perimeter security, CCTV, access control; emergency planning and drills.<br>Multi-agency coordination, training and assurance.                                                 | Scoped in                             |

| Receptor                                                                                                                                                                                                            | Effects                                                                                                                                                                    | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                                                                    | Scoped in/Scoped out (for assessment) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Local communities and members of the public; operational/maintenance staff; Surface waters, Broads National Park and associated ecological receptors, soil, designated ecological sites and biodiversity receptors. | Exposure to external hazards, including very low likelihood radiological release from SZA and SZB.                                                                         | High                  | High                               | Significant                                    | Co-ordination with emergency planning authorities and awareness of external risk registers.<br>Multi-agency emergency preparedness and response arrangements. | Scoped in                             |
| Proposed Development infrastructure and assets; local communities; customers and water consumers; groundwater, aquifers and soils; surface waters;                                                                  | Localised or system-wide service disruption and environmental effects arising from structural failure of the proposed pipeline and above ground infrastructure components. | High                  | High                               | Significant                                    | Design to codes and independent checks.<br>Structural monitoring where relevant.<br>Planned inspections and maintenance regime.                               | Scoped in                             |

| Receptor                                                                                          | Effects                                                                                                                                                                                                                                      | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                  | Scoped in/Scoped out (for assessment) |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------|
| designated ecological sites and biodiversity receptors; cultural heritage assets and archaeology. |                                                                                                                                                                                                                                              |                       |                                    |                                                |                                                                                                             |                                       |
| Coastal waters and marine users; Proposed Development infrastructure and assets.                  | Failure or loss of integrity of offshore CRW disposal infrastructure (all LSO options) due to seabed mobility, coastal processes or structural deterioration, resulting in damage, loss of function, environmental impact or system failure. | Medium - High         | High                               | Significant                                    | Design burial depth and protection.<br>Monitoring surveys.<br>Maintenance and repair strategy.              | Scoped in                             |
| <b>Decommissioning Phase</b>                                                                      |                                                                                                                                                                                                                                              |                       |                                    |                                                |                                                                                                             |                                       |
| Decommissioning personnel; local communities and members of the public; groundwater,              | Spill/fire/explosion and/or potential pollution during chemical isolation and                                                                                                                                                                | Medium - High         | High                               | Significant                                    | Engineered segregation, compatible materials and safe systems.<br>Safe isolation, drain-down and removal of | Scoped in                             |

| Receptor                                                                                                                                                                             | Effects                                                                                                  | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage  | Likely Mitigation Measures                                                                                                                      | Scoped in/Scoped out (for assessment) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| aquifers and soils; coastal waters and marine users; designated ecological sites and biodiversity receptors; landscape; cultural heritage assets and archaeology; transport network. | decommissioning works.                                                                                   |                       |                                    |                                                 | residual chemicals and fuels, emergency response plans. Governance and assurance of hazardous substance management; environmental verification. |                                       |
| Decommissioning personnel; landscape; transport network.                                                                                                                             | Unforeseen structural/building collapse during controlled dismantling/demolition.                        | Low - Medium          | High                               | Not Significant (standard, controlled activity) | Temporary stability controls and controlled dismantling sequences. Independent assurance of structural stability and dismantling methods.       | Scoped in                             |
| Local communities and members of the public; decommissioning personnel; surface                                                                                                      | Exposure to external hazards, including very low likelihood radiological release from SZA and SZB during | High                  | High                               | Significant                                     | Coordination with emergency planning authorities and awareness of external risk registers. Multi-agency emergency                               | Scoped in                             |

| Receptor                                                                                                                                                                                         | Effects                                                                                                         | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                                        | Scoped in/Scoped out (for assessment) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| waters and associated ecological receptors; Broads National Park and associated ecological receptors; soil; designated ecological sites and biodiversity receptors.                              | decommissioning activities, potentially affecting workforce undertaking dismantling works and nearby receptors. |                       |                                     |                                                | preparedness and response arrangements.                                                                           |                                       |
| Decommissioning personnel; transport network and users; Local communities and members of the public; surface waters, groundwaters, aquifers, soils; ecological sites and biodiversity receptors. | Exceptional transport collision scenarios involving abnormal loads during decommissioning.                      | Medium - High         | High                                | Significant                                    | Traffic and access management plans for abnormal loads.<br>Governance of transport movements and incident review. | Scoped in                             |

| Receptor                                                                                                                                                                                                                                                                                                                 | Effects                                                                                                            | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                                                          | Scoped in/Scoped out (for assessment) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------|
| Local communities and members of the public; decommissioning personnel; groundwater, aquifers and soils; surface waters and associated ecological receptors; existing water infrastructure, customers and water consumers; transport network; utilities network; designated ecological sites and biodiversity receptors. | Security incidents (arson, sabotage, unauthorized access) during decommissioning leading to fire or contamination. | Medium - High         | High                               | Significant                                    | Continued site security, fencing and surveillance. Governance of site access and incident response. | Scoped in                             |
| <b>Scoped out – All phases</b>                                                                                                                                                                                                                                                                                           |                                                                                                                    |                       |                                    |                                                |                                                                                                     |                                       |
| All identified receptors (Table 22-3).                                                                                                                                                                                                                                                                                   | Earthquakes - very low UK seismicity in area; severe                                                               | Very Low              | High                               | Not Significant                                | N/A                                                                                                 | Scoped out                            |



| Receptor                                                                 | Effects                                                                                                | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out (for assessment) |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|----------------------------|---------------------------------------|
|                                                                          | damaging events unlikely.                                                                              |                       |                                    |                                                |                            |                                       |
| All identified receptors (Table 22-3).                                   | Landslides - negligible risk in flat/undulating terrain (according to BGS data).                       | Very Low              | Moderate                           | Not Significant                                | N/A                        | Scoped out                            |
| All identified receptors (Table 22-3) (mainly coastal/marine receptors). | Tsunami/tidal waves - extremely low in North Sea; no credible pathway to assets if standards followed. | Very Low              | Moderate                           | Not Significant                                | N/A                        | Scoped out                            |
| All identified receptors (Table 22-3).                                   | Volcanic activity - no UK volcanic risk; Icelandic ash unlikely to affect project.                     | Very Low              | High                               | Not Significant                                | N/A                        | Scoped out                            |
| All identified receptors (Table 22-3).                                   | Avalanche - not applicable to East Anglian lowlands.                                                   | Very Low              | Low                                | Not Significant                                | N/A                        | Scoped out                            |
| All identified receptors (Table 22-3).                                   | Tropical storms (cyclones/hurricanes) - not a UK hazard; high winds addressed separately.              | Very Low              | Moderate                           | Not Significant                                | N/A                        | Scoped out                            |

| Receptor                                                                              | Effects                                                              | Anticipated Magnitude | Anticipated Importance/<br>Sensitivity | Likely Significance<br>of Effect at<br>Scoping<br>Stage | Likely Mitigation<br>Measures                    | Scoped<br>in/Scoped<br>out (for<br>assessment) |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------|----------------------------------------|---------------------------------------------------------|--------------------------------------------------|------------------------------------------------|
| All identified receptors (Table 22-3).                                                | Sandstorms - not relevant to UK climate.                             | Very Low              | Low                                    | Not Significant                                         | N/A                                              | Scoped out                                     |
| Designated ecological sites and biodiversity receptors; landscape receptors.          | Wildfires - low likelihood in East Anglia; limited spread potential. | Low                   | Moderate                               | Not Significant                                         | N/A                                              | Scoped out                                     |
| Local communities and members of the public, including customers and water consumers. | Drought - strategic planning topic, not MA&D event mechanism.        | N/A                   | High                                   | Not Significant                                         | Managed under water resource planning, not MA&D. | Scoped out                                     |
| Proposed Development infrastructure and assets; decommissioning personnel.            | Animal/insect infestation - minor operational nuisance only.         | Low                   | Low                                    | Not Significant                                         | Routine site management.                         | Scoped out                                     |
| Designated ecological sites and biodiversity receptors.                               | INNS - environmental topic; not MA&D pathway.                        | N/A                   | High                                   | Not Significant                                         | Managed under biodiversity mitigation measures.  | Scoped out                                     |

| Receptor                                                                                                                                 | Effects                                                                                                                                                                                                                                                                                               | Anticipated Magnitude | Anticipated Importance/Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures                                              | Scoped in/Scoped out (for assessment) |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------|
| Local communities and members of the public; construction workforce and site personnel, operational staff and decommissioning personnel. | Pandemics/epidemics – workforce availability/business continuity planning issue; no direct MA&D pathway to Proposed Development assets.                                                                                                                                                               | Variable              | High                               | Not Significant                                | Corporate business continuity planning and emergency response measures. | Scoped out                            |
| Local communities and members of the public; construction workforce and site personnel, operational staff and decommissioning personnel. | Large-scale migration/social care failures/civil unrest & strikes - may affect workforce availability, resource availability and the delivery of construction, operational or decommissioning activities, but do not represent accident or disaster mechanisms affecting Proposed Development assets. | Low - Medium          | Moderate                           | Not Significant                                | Contingency planning for resourcing/logistics and business continuity.  | Scoped out                            |

| Receptor                                                      | Effects                                                                                                                                                                                                                                                                                                                                                                                        | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out (for assessment) |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------|---------------------------------------|
| Proposed Development infrastructure and assets.               | Aircraft crash onto assets - extremely low probability; no credible pathway indicated.                                                                                                                                                                                                                                                                                                         | Very Low              | High                                | Not Significant                                | N/A                        | Scoped out                            |
| Marine users; Proposed Development infrastructure and assets. | Offshore shipping collision (post-construction) - the operational proposed LSO component would be located below the seabed and would not protrude into navigable waters (for all three options). Consequently, no credible vessel collision pathway is anticipated during operation. Routine inspection and maintenance activities would be managed through marine coordination procedures and | Very Low              | Moderate                            | Not Significant                                | N/A                        | Scoped out                            |

| Receptor | Effects                                        | Anticipated Magnitude | Anticipated Importance/ Sensitivity | Likely Significance of Effect at Scoping Stage | Likely Mitigation Measures | Scoped in/Scoped out (for assessment) |
|----------|------------------------------------------------|-----------------------|-------------------------------------|------------------------------------------------|----------------------------|---------------------------------------|
|          | temporary exclusion arrangements, as required. |                       |                                     |                                                |                            |                                       |

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## 23 Cumulative Effects Assessment

### 23.1 Introduction

23.1.1 The Environmental Statement ('ES') will consider the likely significant cumulative environmental effects resulting from the construction, operation and decommissioning of the Proposed Development. The cumulative effects to be assessed will comprise:

1. **Inter-project effects** – the effects resulting from the Proposed Development combined with other schemes in the area.
2. **Intra-project effects** - also known as interactive or in-combination effects, are the resulting from multiple impacts/aspects of the Proposed Development affecting a single receptor.

23.1.2 Inter-project effects are detailed within this chapter of the EIA Scoping Report and will be fully assessed within a dedicated chapter of the ES.

23.1.3 Intra-project effects require consideration of all completed environmental assessments and therefore will be reported in the technical chapters of the ES. The assessment will be qualitative, based on professional judgement and following a review of the conclusions of the technical assessments. Intra-project effects will not feature further in this chapter but are outlined within each technical chapter of this EIA Scoping Report.

23.1.4 This chapter will provide (i) a summary of the legislation, policy and guidance relevant to Cumulative Effects Assessment ('CEA'); (ii) a summary of the engagement on CEA undertaken to date; (iii) a summary of the assessment methodology for the CEA to be undertaken in the ES; and (iv) a proposed zones of influence ('Zol') for each environmental aspect. Appendix 23.1 should be read alongside this chapter as it provides the long list of developments for potential consideration in the CEA.

### 23.2 Legislation

23.2.1 Schedule 4(5) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [1] states that an ES should include:

*‘A description of the likely significant effects of the development on the environment resulting from, inter alia—*

*(e)the **cumulation of effects with other existing and/or approved projects**, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;*

*The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.’ (emphasis added)*

- 23.2.2 Schedule 3(5) of The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) [2][3], states:

*‘A description of the likely significant effects of the project and the regulated activity on the environment resulting from, inter alia—*

*(e)the **cumulation of effects with other existing or approved projects**, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;’*

And Schedule 3(6) states:

*‘The description of the likely significant effects on the factors specified in regulation 21A(2)(a) to (e) must cover the direct effects and any indirect, secondary, **cumulative**, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project and the regulated activity.’*

### **National Planning Policy**

- 23.2.3 The National Policy Statement for Water Resources Infrastructure (2023 and most recently updated on 14 July 2025) [4] (‘NPSWRI’) aims to streamline the consenting process for nationally significant infrastructure

projects and those projects accepted to be of national significance by the SoS pursuant to a section 35 direction.

23.2.4 The requirement to consider cumulative effects is outlined in the NPSWRI as follows:

- Paragraph 3.2.6 states that *‘when considering significant cumulative effects, any Environmental Statement should provide information on how the effects of an applicant’s proposal would combine and interact with the effects of other development (including projects for which consent has been granted). The Examining Authority may also have other evidence before it on such effects and potential interactions. Any such information may assist the Secretary of State in reaching decisions on proposals and on mitigation or enhancement measures that may be required’.*
- Paragraph 3.2.7 notes that *‘The Examining Authority should consider how significant cumulative effects, and the interrelationship between effects, might as a whole affect the environment, even though they may be acceptable when considered on an individual basis or with mitigation measures in place.’*

## Guidance

23.2.5 The Planning Inspectorate’s Nationally Significant Infrastructure Projects (‘NSIPs’): Advice on Cumulative Effects Assessment [5] guidance summarises the process for undertaking a CEA for NSIPs [6] and projects of national significance. The guidance suggests four stages to the CEA as described in Table 23-1 below.

Table 23-1: Stages of the CEA

| Stage                                                                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stage 1:<br>Establishing the long list of other existing and, or approved development. | <p>Zols should be defined for each environmental aspect considered within the ES. The Zol for each aspect should support a desk study exercise to identify the long list of other existing and, or approved development in the form of planning applications, relevant development plans and any other available and relevant sources, such as consultation response information from a relevant planning authority.</p> <p>The availability of information needed for the CEA will depend on the status of the other existing and, or approved developments. A level of certainty, based on the available information, should be attributed to each development and</p> |



| Stage                                                                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                | <p>recorded. The following tiers can be used to assign certainty to ‘<i>other existing and, or approved development</i>’:</p> <p><b>Tier 1:</b> projects under construction; permitted applications under the Planning Act 2008 [7] (‘PA 2008’) or other regimes but not yet implemented; submitted applications under the PA 2008 or other regimes but not yet determined; and all refusals subject to appeal procedures not yet determined.</p> <p><b>Tier 2:</b> projects on the Planning Inspectorate’s programme of projects.</p> <p><b>Tier 3:</b> projects on the Planning Inspectorate’s programme of projects where a scoping report has not been submitted; projects identified in the relevant Development Plan and emerging Development Plans, with appropriate weight given as they near adoption, recognising that there will be limited information available on the relevant proposals; and projects identified in other plans and programmes, as appropriate, which set the framework for future development consents or approvals, where such development is reasonably likely to come forward.</p> |
| <p>Stage 2:<br/>Establishing the shortlist of other existing and, or approved development.</p> | <p>After Stage 1, applicants should develop and apply threshold criteria to the long list. Professional judgement could be applied to support the exclusion of other existing and, or approved development that exceeds the thresholds but may not give rise to evident effects. The criteria should address:</p> <p><b>Temporal scope:</b> The relative construction, operation and decommissioning programmes of the other existing and, or approved developments identified in the Zol together with the proposed NSIP’s programme, to establish whether there is overlap and any potential for interaction.</p> <p><b>Scale and nature of development:</b> The scale and nature of the other existing and, or approved developments identified in the Zol that are likely to interact with the proposed NSIP.</p> <p><b>Other factors:</b> For example, the nature and, or capacity of the receiving environment, which could make a significant cumulative effect with the other existing and, or approved developments more or less likely.</p>                                                                 |
| <p>Stage 3:<br/>Information Gathering</p>                                                      | <p>At this stage, the applicant should gather information on each of the other existing and, or approved developments shortlisted at Stage 2. The information should include but not</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Stage                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | be limited to: proposed design and location information, proposed programme of construction, operation and decommissioning, environmental assessments that set out baseline data and effects arising from the other existing and, or approved development.                                                                                                                                                                                                                                                                                                                                                                                                               |
| Stage 4:<br>Assessment | <p>The applicant should assess the cumulative effects of the proposed NSIP with the other existing and, or approved development identified in Stages 1 to 3. Assessments should:</p> <ul style="list-style-type: none"> <li>• Be undertaken at a level of detail proportionate to the information available, explain and record any limits or gaps in the information.</li> <li>• Consider all Tier 1 and Tier 2 other existing and, or approved developments where possible.</li> <li>• Consider all Tier 3 other existing and, or approved development where possible, although this may be qualitative and high level.</li> <li>• Be documented in the ES.</li> </ul> |

## 23.3 Engagement

- 23.3.1 In July 2026, having undertaken Stage 1 of the CEA set out in Table 23-1 above, the Applicant engaged with the relevant Local Planning Authorities ('LPAs') on the long list of other existing and, or approved development within the relevant Zol for each environmental aspect for assessment in the ES. The Applicant requested feedback from the LPAs regarding the developments identified within the long list, and whether any should be added (including any that may enter the public domain shortly) or removed from consideration.
- 23.3.2 The long list included in Appendix 23.1 includes the feedback provided from the engagement with the LPAs. These comprised Suffolk County Council ('SCC'), Norfolk County Council ('NCC'), East Suffolk Council ('ESC'), Mid Suffolk District Council ('MSDC'), South Norfolk District Council ('SNDC'), Great Yarmouth Borough Council ('GYBC') and the Broads Authority ('BA').

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## 23.4 Cumulative Assessment Methodology

### Inter-project Effects

- 23.4.1 For Stage 1 of the CEA, to establish which other existing and, or approved developments should be included in the assessment, the Zol for each environmental aspect considered needs to be defined and documented. The Planning Inspectorate's NSIPs: Advice on Cumulative Effects Assessment guidance states that '*NSIPs often have a broad spatial and temporal zone of influence (Zol)*'.
- 23.4.2 Table 23-2 sets out the proposed Zol for each environmental aspect.

Table 23-2: Zone of Influence for each Environmental Topic

| Environmental Topic                      | Environmental Effects                                                                                                                                                                    | Proposed Zol                                                  | Source of Zol                                                                                                                                                                                                                                                       |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chapter 6<br>Terrestrial<br>Biodiversity | Effects on international sites during construction, operation and decommissioning.                                                                                                       | Within the Order Limits and up to 10km from the Order Limits. | Zol defined in accordance with the Chartered Institute of Ecology and Environmental Management's ('CIEEM') Ecological Guidelines for Ecological Impact Assessment in the UK and Ireland Version 1.3 (2018) [8] (the 'CIEEM Guidelines') and professional judgement. |
|                                          | Effects on other designated sites through habitat loss or degradation, fragmentation of species populations or habitats, disturbance during construction, operation and decommissioning. | Within the Order Limits and up to 2km from the Order Limits.  | Zol defined in accordance with the CIEEM Guidelines and professional judgement.                                                                                                                                                                                     |
|                                          | Loss or gain of notable habitats during construction, operation and decommissioning.                                                                                                     | Within the Order Limits and up to 500m from the Order Limits. | Zol defined in accordance with the CIEEM Guidelines and professional judgement.                                                                                                                                                                                     |
|                                          | Impacts to protected or notable species through habitat loss or degradation, fragmentation, disturbance during construction, operation and decommissioning.                              | Within the Order Limits and up to 2km from the Order Limits.  | Zol defined in accordance with the CIEEM Guidelines and professional judgement.                                                                                                                                                                                     |
|                                          | Impacts to foraging/commuting bats through habitat loss or degradation, fragmentation,                                                                                                   | Within the Order Limits and up to 6km from the Order Limits.  | In line with the Bat Conservation Trust's Good Practice Guidelines [9], a 6km study area for bats will                                                                                                                                                              |

| Environmental Topic                     | Environmental Effects                                                                                                          | Proposed Zol                                                                                                                                                               | Source of Zol                                                                                                                                                                                                     |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | disturbance during construction, operation and decommissioning.                                                                |                                                                                                                                                                            | be used as this is the Core Sustenance Zone for barbastelle bats, which are known to be present in the local area.                                                                                                |
|                                         | Disturbance to overwintering birds during construction, operation and decommissioning.                                         | Within the Order Limits and up to 650m from the Order Limits.                                                                                                              | Zol defined in accordance with maximum disturbance distance for species considered likely to be present.<br>Disturbance distances set out in selected Scottish Bird Species – NatureScot Guidance (2022) [10].    |
|                                         | Impacts to protected sites through construction dust and vehicle emissions during construction, operation and decommissioning. | Within the Order Limits and up to 200m from the Order Limits and the Affected Road Network.                                                                                | Zol defined in accordance with Natural England's Air Pollution and Development: Advice for Local Authorities (2025) [11] guidance.                                                                                |
| Chapter 7<br>Freshwater<br>Biodiversity | Effects on rivers and streams (physical habitat) during construction, operation and decommissioning.                           | Within the Order Limits and up to 500m from the Order Limits.                                                                                                              | Zol defined in accordance with the CIEEM Guidelines and project-specific Biodiversity Data Collection Strategy (refer to Appendix 6.2).                                                                           |
|                                         | Effects on macroinvertebrate communities during construction, operation and decommissioning.                                   | Within the Order Limits and up to 2km upstream and downstream of watercourse crossing points and discharge/abstraction locations associated with the Proposed Development. | Zol defined in accordance with the Environment Agency's ('EA') Operational Instruction 01808 (2017) [12], WFD-UKTAG Rivers Assessment Methods: Benthic Invertebrate Fauna guidance [13], and ISO 10870:2012 [14]. |

| Environmental Topic | Environmental Effects                                                                                         | Proposed Zol                                                                                                                                                                | Source of Zol                                                                                                                                                                                                  |
|---------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Effects on diatom communities (phytobenthos) during construction, operation and decommissioning.              | Within the Order Limits and up to 2km upstream and downstream of watercourse crossing points and discharge/abstraction locations associated with the Proposed Development.  | Zol defined in accordance with EA Operational Instruction 2707 (2018) [15] and EN EN 13946:2025 [16]. Zol accounts for sensitivity to water quality changes and flow variability affecting diatom assemblages. |
|                     | Effects on macrophyte communities during construction, operation and decommissioning.                         | Within the Order Limits and up to 200m upstream and downstream of watercourse crossing points and discharge locations associated with the Proposed Development.             | Zol defined in accordance with EA Operational Instruction 13107 (2011) [17] and LEAFPACS methodology [18].                                                                                                     |
|                     | Effects on fish populations (including migratory species) during construction, operation and decommissioning. | Within the Order Limits and within 500m of watercourse crossing points, discharge and abstraction locations of the Proposed Development (subject to agreement with the EA). | Zol defined in accordance with EA Operational Instruction 99308 (2019) [19] for electric fishing surveys, Hendry & Cragg-Hine (1997) fish habitat assessment [20], and the CIEEM Guidelines.                   |
|                     | Effects on ditches during construction, operation and decommissioning, where hydrologically connected.        | Within the Order Limits and up to 500m from the Order Limits (where required).                                                                                              | No change required.                                                                                                                                                                                            |
|                     | Water Framework Directive ('WFD') compliance during construction, operation and decommissioning.              | Water bodies within the hydrological catchment influenced by the Proposed Development (defined through hydrological modelling).                                             | Zol defined in accordance with WFD 2000/60/EC [21], The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 [22], and EA                                                        |

| Environmental Topic              | Environmental Effects                                                                                                                                                                                         | Proposed Zol                                                                                                                                                                                                                                                                            | Source of Zol                                                                                                                                                                                                                                                     |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                         | Water Framework Directive compliance assessment guidance.                                                                                                                                                                                                         |
|                                  | Effects on designated sites with freshwater aquatic features (The Broads Special Area of Conservation ('SAC') and Redgrave & Lopham Fens SAC/Ramsar site) during construction, operation and decommissioning. | Up to 10km from the Order Limits for international sites; up to 2km from the Proposed Development for national/local designated sites with freshwater aquatic features.                                                                                                                 | Zol defined in accordance with CIEEM Guidelines and Habitats Regulations Assessment guidance [23] (including the Planning Inspectorate's NSIPs: Advice on Habitats Regulations Assessments and Department for Environment, Food and Rural Affairs' HRA guidance). |
| Chapter 8<br>Marine Biodiversity | Effects due to reduction in water quality during construction and operation for the Proposed Development's long sea outfall ('LSO') component Option 1 and during operation only for LSO Options 2 and 3.     | Based on the current dispersion modelling for the proposed new LSO (Option 1), and the most sensitive pollutants modelled, the Zol is approximately 6km alongshore and 300m cross-shore. For Options 2 and 3 which would utilise existing outfall infrastructure, the Zol would be 6km. | Zol defined in accordance with the CIEEM Guidelines.                                                                                                                                                                                                              |
|                                  | Effects resulting from underwater noise - disturbance from vessel movement and construction/removal of a proposed new LSO (Option 1) and any construction/removal works                                       | Up to 10km from the proposed LSO (Options 1, 2 and 3), 30km for effects on highly mobile species. .                                                                                                                                                                                     | Zol defined in accordance with the CIEEM Guidelines.                                                                                                                                                                                                              |

| Environmental Topic            | Environmental Effects                                                                                                            | Proposed Zol                                                                                            | Source of Zol                                                                                                                                                                     |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | required to utilise existing LSO infrastructure (Options 2 and 3) during construction, operation and decommissioning.            |                                                                                                         |                                                                                                                                                                                   |
|                                | Loss/disturbance of marine habitats during construction, operation and decommissioning.                                          | Up to 10km from the proposed LSO (Options 1, 2 and 3), up to 30km for effects on highly mobile species. | Zol defined in accordance with the CIEEM Guidelines.                                                                                                                              |
|                                | Effects on suspended sediment due to construction works and vessel movements during construction, operation and decommissioning. | Up to 10km from the proposed LSO (Options 1, 2 and 3), up to 30km for effects on highly mobile species. | Zol defined in accordance with the CIEEM Guidelines.                                                                                                                              |
|                                | Effects resulting from accidental pollution events during construction and decommissioning.                                      | Up to 10km from the proposed LSO (Options 1, 2 and 3), up to 30km for effects on highly mobile species. | Zol defined in accordance with the CIEEM Guidelines.                                                                                                                              |
|                                | Effects due to return to baseline water quality (prior to the construction and operation of the LSO) during decommissioning.     | Up to 6km from the proposed LSO for Options 1, 2 and 3.                                                 | Zol defined in accordance with the CIEEM Guidelines.                                                                                                                              |
| Chapter 9<br>Water Environment | Effects on surface water during construction, operation and decommissioning.                                                     | Up to 1km from the Order Limits.                                                                        | Zol is set based upon professional judgement and the broad principles of assessment set out in National Highways (formerly Highways England) guidance documents Design Manual for |
|                                | Effects on groundwater during construction, operation and decommissioning.                                                       | Up to 1km from the Order Limits.                                                                        |                                                                                                                                                                                   |



| Environmental Topic                            | Environmental Effects                                                                                                         | Proposed Zol                                                                                                                                                                                                                                                                                        | Source of Zol                                                                                                                                                                                                                          |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                | Effects on flood risk during construction, operation and decommissioning.                                                     | Up to 1km from the Order Limits.                                                                                                                                                                                                                                                                    | Roads and Bridges LA 113 - Road Drainage and the Water Environment (2014) [24] and the Design Manual for Roads and Bridges LA 104 - Environmental Assessment and Monitoring (2020) [25].                                               |
| Chapter 10<br>Landscape and Visual             | Landscape effects during construction, operation and decommissioning.                                                         | The Zol would include the Order Limits and the full extent of the wider landscape around it which the Proposed Development may influence in a significant manner. This will be based on the extent of Landscape Character Areas, likely to be significantly affected either directly or indirectly. | Zol defined in accordance with the Landscape Institute's Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3') [26].                                                                                            |
|                                                | Visual effects during construction, operation and decommissioning.                                                            | This will include the potential extent of the zone of theoretical visibility (ZTV') for the Proposed Development.                                                                                                                                                                                   | Zol defined in accordance with the GLVIA3.                                                                                                                                                                                             |
| Chapter 11<br>Terrestrial Historic Environment | Effects on designated and non-designated heritage assets (direct impacts) during construction, operation and decommissioning. | Up to 500m from the Order Limits.                                                                                                                                                                                                                                                                   | Zol defined in accordance with the Chartered Institute for Archaeologists' ('CifA') Standard and Guidance for Historic Environment Desk Based Assessment ('HEDBAs') (2014) [27], National Highways' (formerly Highways England) Design |

| Environmental Topic | Environmental Effects                                                                                        | Proposed Zol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Source of Zol                                                                                                                                                                                                                                                                                                                                   |
|---------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Manual for Roads and Bridges LA 106 - Cultural Heritage Assessment (2020) [28] (the 'DMRB LA 106 Guidance') and the Institute of Sustainability and Environmental Professionals' ('ISEP') (formerly the Institute of Environmental Management and Assessment ('IEMA')) Principles of Cultural Heritage Impact Assessment in the UK (2021) [29]. |
|                     | Effects on designated heritage assets (indirect impacts) during construction, operation and decommissioning. | For designated heritage assets and indirect effects, there is not a set study area set out in best practice guidance. The National Highways' (formerly Highways England) DMRB LA 106 Guidance, which is used for assessing impacts upon the historic environment, states that a study area needs to include assets within the zone of visual influence or that might be affected by noise. Visual influence tends to be the larger study area and would draw upon the ZTV to be undertaken for the Proposed Development. | Zol defined in accordance with CifA's Standard and Guidance for HEDBAs (2014), Historic England's The Setting of Heritage Assets (2017) National Highways' (formerly Highways England) DMRB LA106 Guidance and ISEP's (formerly IEMA) Principles of Cultural Heritage Impact Assessment in the UK (2021) guidance.                              |

| Environmental Topic                       | Environmental Effects                                                                                                                                                                 | Proposed Zol                                                                                                                                                                                                | Source of Zol                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chapter 12<br>Marine Historic Environment | Direct impact to known and unknown heritage assets within the footprint of the proposed LSO component of the Proposed Development during construction, operation and decommissioning. | Up to 500m from the LSO. This applies to Option 1 only, as Options 2 and 3 are unlikely to cause impacts on the marine historic environment as they do not require infrastructure seawards of MHWS.         | Zol defined in accordance with the CifA's Standard and Guidance for HEDBAs (2014), National Highways' (formerly Highways England) DMRB LA106 Guidance, ISEP's (formerly IEMA) Principles of Cultural Heritage Impact Assessment in the UK (2021) and Oxford Archaeology's Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (2008) [30]. |
|                                           | Indirect impacts to known and unknown heritage assets as a consequence of geomorphological changes during construction, operation and decommissioning.                                | Up to 2km from the proposed LSO. This applies to Option 1 only, as Options 2 and 3 are unlikely to cause impacts on the marine historic environment as they do not require infrastructure seawards of MHWS. | Zol defined in accordance with the CifA's Standards and Guidance for HEDBAs (2014), National Highways' (formerly Highways England) DMRB LA106 Guidance, ISEP's (formerly IEMA) Principles of Cultural Heritage Impact Assessment in the UK (2021) and COWRIE's Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (2008).                 |
|                                           | Impacts to the setting and significance of marine heritage assets that are periodically,                                                                                              | Up to 2km from the LSO. This applies to Option 1 only, as Options 2 and 3 are unlikely to                                                                                                                   | Zol defined in accordance with the CifA's Standards and Guidance for HEDBAs (2014), National                                                                                                                                                                                                                                                                                                    |

| Environmental Topic              | Environmental Effects                                                             | Proposed Zol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Source of Zol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | partially or wholly submerged during construction, operation and decommissioning. | cause impacts on the marine historic environment as they do not require infrastructure seawards of MHWS.                                                                                                                                                                                                                                                                                                                                                                                                        | Highways' (formerly Highways England) DMRB LA106 Guidance, ISEP's (formerly IEMA) Principles of Cultural Heritage Impact Assessment in the UK (2021) and COWRIE's Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (2008).                                                                                                                                                                                                                                                 |
| Chapter 13<br>Traffic and Access | Effects on major roads during construction and operation.                         | The Zol will be established through stakeholder engagement and progressed in accordance with the traffic assumptions for the Proposed Development. Consideration will be given to ISEP's (formerly IEMA) Environmental Assessment of Traffic and Movement guidelines [31] thresholds of 30% change in movements (all traffic or change in heavy goods vehicle ('HGV') traffic) or 10% change in sensitive areas. At this scoping stage, the Zol is proposed to be up to 5km from the EIA Scoping Area boundary. | <p>The Zol is defined in accordance with ISEP's Environmental Assessment of Traffic and Movement guidelines and is to be agreed in consultation with SCC's and NCC's Highways departments and National Highways.</p> <p>Parameters used to inform the long list of cumulative schemes are as follows:</p> <ul style="list-style-type: none"> <li>• NSIPs and committed major transport projects within and through Suffolk and Norfolk which would have a construction period concurrent with the Proposed Development.</li> </ul> |

| Environmental Topic | Environmental Effects | Proposed Zol | Source of Zol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------|-----------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                       |              | <ul style="list-style-type: none"> <li>Committed developments within Suffolk and Norfolk which are forecast to derive more than 150 movements within the network peak period where those movements would be coincident with the forecast movement network for the Proposed Development's construction period.</li> </ul> <p>Committed transport projects within the Suffolk Local Transport Plan (LTP4 – 2025-2040), Chapter 3 of the Implementation Plan of Norfolk's Local Transport Plan (LTP4 2021-2026) [32] and Department for Transport's RIS3 [33] (to include RIS4 as it emerges) which are forecast to alter the configuration of A and B classified roads within Suffolk during the Proposed Development's construction period or materially to affect travel patterns within Suffolk. These should be within the geographic area of the A14/A140/A47/A12 corridors.</p> |

| Environmental Topic                 | Environmental Effects                                                                                                     | Proposed Zol                                                                                                                                                                                                                                                                                                    | Source of Zol                                                                                                                                                                                                                                                                |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chapter 14<br>Noise and Vibration   | Construction Noise effects during construction and decommissioning.                                                       | Up to 300m from the Order Limits.                                                                                                                                                                                                                                                                               | Zol defined in accordance with guidance detailed in the National Highways' (formerly Highways England) Design Manual for Roads and Bridges DMRB LA 111– Noise and Vibration [34] (the 'DMRB LA 111 Guidance') on distance beyond which significant impacts are not expected. |
|                                     | Construction Vibration effects during construction and decommissioning.                                                   | Up to 100m from the Order Limits.                                                                                                                                                                                                                                                                               | Zol defined in accordance with guidance detailed in the National Highways' (formerly Highways England) DMRB LA 1111 Guidance on distance beyond which significant impacts are not expected.                                                                                  |
|                                     | Operational Noise effects from Fixed Plant Assets for operational phase.                                                  | Up to 1km from fixed plant assets.                                                                                                                                                                                                                                                                              | Zol defined based on professional judgement based on likelihood of significant impacts.                                                                                                                                                                                      |
| Chapter 15<br>Air Quality and Odour | Dust emissions generated by construction activities including site preparation, excavation and material handling/storage. | The assessment of effects on human and ecological receptors focuses on areas up to 250m and 50m, respectively, from the Order Limits. The effects of trackout (i.e. the transport of dust and dirt from a construction site onto the public road network) has the potential to occur up to 50m from the edge of | Zol defined in accordance with the Institute of Air Quality Management's ('IAQM') Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (2024) [35].                                                                                               |

| Environmental Topic | Environmental Effects                                                                                                              | Proposed Zol                                                                                                                                                                                                   | Source of Zol                                                                                                                          |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                    | local construction routes up to 250m of the construction site exit(s).                                                                                                                                         |                                                                                                                                        |
|                     | Emissions of pollutants to air from construction vehicles on the local road network.                                               | Up to 200m of the 'affected' roads (i.e. roads triggered by the Environmental Protection UK ('EPUK')/IAQM guidance screening criteria).                                                                        | Zol defined in accordance with the EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality guidance (2017) [36]. |
|                     | Emissions of pollutants to air from construction plant and machinery.                                                              | Zol of potential air quality effects from plant and machinery would include receptors within 500m of the Order Limits.                                                                                         | Zol defined based on professional judgement.                                                                                           |
|                     | Odour emissions during construction earthworks.                                                                                    | Zol of potential air quality effects from odour would include receptors within 2km of the Order Limits.                                                                                                        | Zol defined based on professional judgement.                                                                                           |
|                     | Emissions of pollutants to air from operational vehicles on the local road network.                                                | Zol of potential air quality effects from associated operational road traffic would include receptors within 200m of the 'affected' roads (i.e. roads triggered by the EPUK/IAQM guidance screening criteria). | Zol defined in accordance with the EPUK/IAQM Land-Use Planning & Development Control: Planning for Air Quality guidance (2017).        |
|                     | Emissions of pollutants to air from operational plant and machinery including the proposed Advanced Water Recycling Plant ('AWRP') | For human receptors, the closest and most relevant sensitive human receptors to the proposed emission sources would be considered. For ecological                                                              | Zol defined in accordance with the EA's Air Emissions Risk Assessment for your Environmental Permit [37] guidance.                     |

| Environmental Topic          | Environmental Effects                                                                                                           | Proposed Zol                                                                                                                                                                                                                                                                            | Source of Zol                                                                                                                                    |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | component of the Proposed Development.                                                                                          | receptors, it would be necessary to identify SPAs, SACs and Ramsar sites within 10km of the Site and Sites of Special Scientific Interest and local nature sites (i.e. ancient woodlands, local wildlife sites and national and local nature reserves), within 2km of the Order Limits. |                                                                                                                                                  |
|                              | Odour emissions generated from the operation of the proposed AWRP component of the Proposed Development.                        | Zol of potential air quality effects from odour would include receptors within 2km of the Order Limits.                                                                                                                                                                                 | Zol defined based on professional judgement.                                                                                                     |
|                              | Dust emissions generated by the removal of the associated developments, such as the temporary works to support decommissioning. | The assessment at human and ecological receptors focuses on areas up to 250m and 50m, respectively, from the Order Limits. The effects of trackout have the potential to occur up to 50m from the edge of local construction routes up to 250m of the construction site exit(s).        | Zol defined in accordance with the IAQM's Guidance on the assessment of dust from demolition and Construction, version 2.2 (2024).               |
| Chapter 16<br>Climate Change | Greenhouse Gas Emissions ('GHG') effects during construction, operation and decommissioning.                                    | All global cumulative GHG sources are relevant to the effects on climate change, and this would be taken into account in defining the receptor (the atmospheric concentration of GHGs) as being                                                                                         | Zol defined in accordance with ISEP's (formerly IEMA) Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022) [38] guidance. |



| Environmental Topic           | Environmental Effects                                                                                                          | Proposed Zol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Source of Zol                                                                                                                                                |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                                                                                                                                | of 'high' sensitivity to further emissions. Effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other. Operational traffic data utilised in the climate change assessment may account for cumulative schemes, for which the Zol is defined by the transport modelling for the Proposed Development. |                                                                                                                                                              |
|                               | Climate change risk during construction and operation.                                                                         | Climate change adaptation effects are specific to the Proposed Development and will not result in impacts to cumulative development.                                                                                                                                                                                                                                                                                                                                                                        | Zol defined in accordance with ISEP's (formerly IEMA) Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (2020) [39] guidance. |
| Chapter 17<br>Socio-economics | Creation of jobs and employment opportunities for local people and wider supply chain during construction and decommissioning. | The relevant LPAs based on the Order Limits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Zol aligned with human health which is defined in accordance with ISEP's (formerly IEMA) Determining Significance for Human Health in Environmental          |

| Environmental Topic        | Environmental Effects                                                                                                                                                                                                                                          | Proposed Zol                                                                                                                                                                                                                             | Source of Zol                                                                                                                                       |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | Opportunity to upskill the local workforce, enhancing the local labour market during construction and decommissioning.                                                                                                                                         | The relevant LPAs based on the Order Limits.                                                                                                                                                                                             | Impact Assessment (2022) [40] guidance.                                                                                                             |
|                            | Potential disruption and adverse effect on existing businesses from construction activities. Beneficial impacts for some business types via spend from construction workforce.                                                                                 | Up to 500m from the Order Limits.                                                                                                                                                                                                        |                                                                                                                                                     |
|                            | Potential disruption and adverse effect on tourist facilities and visitor numbers from reduced amenity value and reduced availability in temporary accommodation market.                                                                                       | Up to 2km from the Order Limits.                                                                                                                                                                                                         |                                                                                                                                                     |
|                            | Beneficial effects to local business water users from the provision of a direct water supply during operation.                                                                                                                                                 | The Suffolk water supply area [41].                                                                                                                                                                                                      |                                                                                                                                                     |
| Chapter 18<br>Human Health | All effects scoped into Human Health (the following categories will be considered: Health-Related Behaviours, Social Environment, Economic Environment, Bio-Physical Environment, Institutional and Built Environment) where relevant during the construction, | Up to 500m from the Order Limits in relation to the pipeline components of the Proposed Development and up to 2km from the Order Limits in relation to the proposed AWRP, CSR, WSR and LSO components (applicable to all 3 LSO options). | Zol defined in accordance with ISEP's (formerly IEMA) Determining Significance for Human Health in Environmental Impact Assessment (2022) guidance. |

| Environmental Topic                       | Environmental Effects                                                                                                                                                                                                                 | Proposed Zol                                                       | Source of Zol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | operation and decommissioning phases.                                                                                                                                                                                                 |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Chapter 19<br>Ground Conditions           | Effects on sites of geological importance during construction, operation and decommissioning.                                                                                                                                         | Up to 250m from the Order Limits.                                  | Given the scale and nature of the Proposed Development, this is considered a robust, yet proportionate approach based on professional judgement, knowledge of similar projects and the National Highways' (formerly Highways England) Design Manual for Roads and Bridges LA 109 - Geology and Soils [42]. Although not directly relevant for this development type, this also accords with the study area recommended in the National House Building Council's Guidance for the Safe Development of Housing on Land Affected by Contamination (2008) [43]. |
|                                           | Effects on contaminated land during construction, operation and decommissioning.                                                                                                                                                      |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Chapter 20<br>Agricultural land and soils | Effects on geology and soils during construction (arising from soil stripping, storage, handling and reinstatement; effects relate to both temporary and permanent land take. Negligible or no effect anticipated during operation or | Within the Order Limits for both temporary and permanent land take | Effects are not expected to exceed the Order Limits. The best practice guidance, ISEP's (formerly IEMA) A New Perspective on Land and Soil in Environmental Impact Assessment (2022) [44], does not prescribe a specific Zol but                                                                                                                                                                                                                                                                                                                            |

| Environmental Topic                  | Environmental Effects                                                                                                                                                                                                                                                                                                                                                                                | Proposed Zol                                                                                                                                                                                               | Source of Zol                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | decommissioning as soil will be stabilised and managed in situ).                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                            | recommends a function-based approach, where the Zol is defined by the spatial extent of soil disturbance and handling activities, which are typically restricted to areas of temporary and permanent land take within the Order Limits.                                                                                                                                                                          |
|                                      | Effects on agricultural businesses (primarily construction phase, resulting from temporary and permanent land take, which may affect land access, land availability and drainage; potential temporary severance or disruption during construction; limited residual effect where land is reinstated; permanent effect relate to any irreversible land loss; no decommissioning effects anticipated). | Within the Order Limits, for both temporary and permanent land take with effects on farm holdings assumed to remain internal to the Order Limits in the absence of off-site severance or drainage changes. | Effects are not expected to exceed the Order Limits, assuming no severance of access or drainage changes. No set guidance is applicable for this assessment but has been derived from ISEP's (formerly IEMA) A New Perspective on Land and Soil in Environmental Impact Assessment (2022) and HS2 (2013) London-West Midlands Environmental Statement Volume 5 Scope and Methodology addendum CT-001-000/2 [45]. |
| Chapter 21<br>Materials and<br>Waste | Effects on materials availability during construction.                                                                                                                                                                                                                                                                                                                                               | Sub-regional (Suffolk and Norfolk counties); regional (East of England); national (UK); and/or international.                                                                                              | Zol defined in accordance with ISEP's (formerly IEMA) Guide to: Materials and Waste in Environmental Impact Assessment (2020) [46].                                                                                                                                                                                                                                                                              |
|                                      | Effects on minerals safeguarding during construction.                                                                                                                                                                                                                                                                                                                                                | Sub-regional (Suffolk and Norfolk counties).                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Environmental Topic                         | Environmental Effects                                                                                                                          | Proposed Zol                                                                                                           | Source of Zol                                                                                                                                |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                                             | Effects on landfill void capacity during construction.                                                                                         | Sub-regional (Suffolk and Norfolk counties) for inert and non-hazardous waste; national (England) for hazardous waste. |                                                                                                                                              |
| Chapter 22<br>Major Accidents and Disasters | Effects from the construction of the pipeline components of the Proposed Development.                                                          | Construction working corridor and trenchless compound areas.                                                           | Zol defined in accordance with ISEP's (formerly IEMA) Major Accidents and Disasters in EIA: A Primer (2020) [47] and professional judgement. |
|                                             | Effects on chemical storage and delivery during the AWRP component of the Proposed Development's operational phase.                            | Within the Order Limits and its operational phase delivery routes.                                                     | Zol defined in accordance with ISEP's (formerly IEMA) Major Accidents and Disasters in EIA: A Primer (2020) and professional judgement.      |
|                                             | Effects on contaminated land during construction and decommissioning.                                                                          | Extent of contamination and migration pathways.                                                                        | Zol defined in accordance with the EA's Land Contamination Risk Management [48] guidance, EA mapping and professional judgement.             |
|                                             | Effects on flood risk during construction, operation and decommissioning.                                                                      | Flood Risk Zones (2 and 3).                                                                                            | Zol based on EA flood mapping and professional judgement.                                                                                    |
|                                             | Proximity to Control of Major Accidents Hazards ('COMAH') sites or hazardous installations during construction, operation and decommissioning. | Health and Safety Executive ('HSE') consultation zones.                                                                | Zol defined in accordance with the COMAH Regulations 2015, HSE guidance [49] and informed by professional judgement.                         |

| Environmental Topic | Environmental Effects                                                                                  | Proposed Zol                                          | Source of Zol                                                                                                                                                                                            |
|---------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Unexploded Ordnance ('UXO') risk during construction and decommissioning.                              | Areas identified through UXO desk study and survey.   | Zol defined in accordance with the Construction Industry Research and Information Association's ('CIRIA') C681 guidance [50] and C754 (marine UXO guidance) [51] and informed by professional judgement. |
|                     | Effects due to the Proposed Development's CSR and WSR components during operation and decommissioning. | CSR and WSR site areas and the downstream flood path. | Zol defined in accordance with ISEP's Major Accidents and Disasters in EIA: A Primer (2020), EA flood mapping and informed by professional judgement.                                                    |

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- 23.4.3 The CEA in the ES will follow the sequential approach provided in the Planning Inspectorate's NSIPs: Advice on Cumulative Effects Assessment guidance. The CEA will therefore be split into four distinct phases, as detailed in paragraph 23.2.5.
- 23.4.4 To identify the initial long list of cumulative schemes (Stage 1), a desk-based study has been conducted by reviewing planning applications based on the largest reasonable Zol of 5km and including developments larger than 50 units or 10,000m<sup>2</sup> of commercial floorspace. The long list of developments is presented in Appendix 23.1 and includes developments captured within the three tiers as set out in paragraph 23.2.5.
- 23.4.5 The Zol of 5km around the EIA Scoping Area is presented in Figure 23-1 and Figure 23-2 demonstrates the long list of cumulative schemes within the 5km Zol.
- 23.4.6 The long list has not been restricted to development of the same type as the Proposed Development.
- 23.4.7 The long list has been identified by a desk-based review of published sources. Searches have been conducted online, using the websites of the relevant LPAs, comprising SCC [52], NCC [53], ESC [54], MSDC [55], SNDC [56], GYBC [57] and the BA [58]. In addition to this, searches have also been conducted on the Planning Inspectorate's website [59] to identify other DCO applications (and consented applications) within the Zol (some DCOs included are further than the 5km radius in order to capture the cumulative impact on the wider Suffolk area).
- 23.4.8 The final list of cumulative schemes to be considered with the Proposed Development will be detailed within the ES and will include an explanation of the list of cumulative schemes included in the CEA.
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## 24 Summary

- 24.1.1 This Scoping Report is submitted in support of a request pursuant to Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [1] and Regulation 13 of The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2017) [2], [3] for a Scoping Opinion from the Secretary of State ('SoS') on the scope, and level of detail, of the information to be provided in the Environmental Statement ('ES'). It includes the information required by Regulation 10(3) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as follows:
1. A plan sufficient to identify the land (refer to Figure 1-1, Figure 1-2 and Figure 1-3).
  2. A description of the Proposed Development, including its location and technical capacity (refer to chapter 2 the Proposed Development).
  3. An explanation of the likely significant effects of the Proposed Development on the environment (refer to chapters 6 to 22).
  4. Such other information or representations as the person making the request may wish to provide or make (refer to all figures and appendices provided).
- 24.1.2 A discussion of the technical topics proposed to be scoped out of the ES is presented in chapter 4. The scoping out of these topics has been informed by professional judgement, the nature of the Proposed Development, initial baseline assessments including desk-based research and site surveys, and consultation with the local planning authorities and statutory bodies.
- 24.1.3 The emission of heat and radiation is the only topic included in the *inter alia* list at paragraph 5 of Schedule 4 to The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and paragraph 5 of Schedule 3 to The Marine Works (Environmental Impact Assessment) Regulations 2007 which is not proposed to be scoped in. Chapter 4 provides an explanation to justify the exclusion of heat and radiation from the EIA Scoping.



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- 24.1.4 Chapter 5 outlines the topics that are proposed to be scoped into the ES. In addition, chapter 5 details how both coastal and intertidal impacts and impacts on maritime navigation are to be considered within relevant topic chapters.
- 24.1.5 The topics that are proposed to be scoped into the ES are set out below:
- Chapter 6 Terrestrial Biodiversity.
  - Chapter 7 Freshwater Biodiversity.
  - Chapter 8 Marine Biodiversity.
  - Chapter 9 Water Environment.
  - Chapter 10 Landscape and Visual.
  - Chapter 11 Terrestrial Historic Environment.
  - Chapter 12 Marine Historic Environment.
  - Chapter 13 Traffic and Access.
  - Chapter 14 Noise and Vibration.
  - Chapter 15 Air Quality and Odour.
  - Chapter 16 Climate Change.
  - Chapter 17 Socio-economics.
  - Chapter 18 Human Health.
  - Chapter 19 Ground Conditions.
  - Chapter 20 Agricultural Land and Soils.
  - Chapter 21 Materials and Waste.
  - Chapter 22 Major Accidents and Disasters.
- 24.1.6 Table 24-1 summarises the impacts within each topic which are proposed to be scoped out of the ES. Details on the justification for scoping these impacts out are contained within the chapters 6-22. Table 24-1 focuses on the impacts scoped out for all components of the Proposed Development, details on impacts which are scoped out for some components and not others are contained within chapter 6-22.
- 24.1.7 Where uncertainty exists, the chapters 6-22 have scoped in impacts on a precautionary basis. These may later be scoped out of assessment in the ES as baseline data collection and the Proposed Development design progresses. Likewise, if the design of the Proposed Development changes
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such that any impacts scoped out should be scoped back in, this will be reviewed and included as required in the ES.

Table 24-1: Summary of Impacts Proposed to be Scoped out of the ES

| Topic                                    | Impacts Proposed to be Scoped Out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chapter 6<br>Terrestrial<br>Biodiversity | <ul style="list-style-type: none"> <li>• Impacts associated with pre-construction ecological mitigation and surveys and monitoring.</li> <li>• Terrestrial biodiversity receptors beyond the specified study areas during construction, operational and decommissioning phases.</li> <li>• Designated sites located further than 2km from the EIA Scoping Area where no impact pathways are evident during construction, operational and decommissioning phases.</li> <li>• Statutory designated sites located beyond 5km of the site which are designated for bird species or bird assemblages during construction, operational and decommissioning phases.</li> <li>• Terrestrial biodiversity receptors not considered 'important ecological features' during construction, operational and decommissioning phases.</li> <li>• Coastal and intertidal habitats during the operational phase.</li> </ul>                                                                                                                          |
| Chapter 7<br>Freshwater<br>Biodiversity  | <ul style="list-style-type: none"> <li>• Impacts associated with pre-construction ecological mitigation and surveys and monitoring.</li> <li>• Freshwater biodiversity receptors beyond the specified study areas where no realistic hydrological, hydrogeological or ecological connectivity exists during construction, operational and decommissioning phases.</li> <li>• Designated sites located beyond the defined study areas where no impact pathway is evident during construction, operational and decommissioning phases.</li> <li>• Watercourses, waterbodies and associated freshwater habitats with no direct or indirect interaction with the Proposed Development during construction, operational and decommissioning phases.</li> <li>• Freshwater biodiversity receptors not considered 'important ecological features' during construction, operational and decommissioning phases.</li> <li>• Effects associated with the proposed pipelines and distribution mains where there would be no routine</li> </ul> |

| Topic                                       | Impacts Proposed to be Scoped Out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                             | interaction with a watercourse or freshwater habitat during the operational phase.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Chapter 8 Marine Biodiversity               | <ul style="list-style-type: none"> <li>Marine ecological receptors not considered 'important ecological features' at a local level or above during construction, operational and decommissioning phases.</li> <li>Marine biodiversity receptors beyond the specified study areas during construction, operational and decommissioning phases.</li> <li>Designated sites (statutory and non-statutory) located beyond the specified study areas where no impact pathway is evident during construction, operational and decommissioning phases.</li> <li>Commercial shellfish during the decommissioning phase.</li> </ul> |
| Chapter 9 Water Environment                 | <ul style="list-style-type: none"> <li>At this stage, no water environment impacts are proposed to be scoped out of the assessment during the construction, operational and/or decommissioning phases.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                         |
| Chapter 10 Landscape and Visual             | <ul style="list-style-type: none"> <li>Landscape receptors such as ancient woodland, veteran trees and tree protection orders located at distances of greater than 15m from the Order Limits during construction, operation and decommissioning phases.</li> <li>Visual receptors at distances of greater than 2km from the Proposed Development's above-ground infrastructure during the operational phase, and from main/satellite compounds during the construction and decommissioning phases.</li> <li>Night-time construction effects for the proposed pipeline components.</li> </ul>                              |
| Chapter 11 Terrestrial Historic Environment | <ul style="list-style-type: none"> <li>At this stage, no terrestrial historic environment impacts are proposed to be scoped out of the assessment during the construction, operational and/or decommissioning phases.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                          |
| Chapter 12 Marine Historic Environment      | <ul style="list-style-type: none"> <li>At this stage, Options 2 and 3 for the long sea outfall ('LSO') component are unlikely to have any impact on the marine historic environment and are proposed to be scoped out during the construction, operational and decommissioning phases.</li> <li>At this stage, no marine historic environment impacts relating to the Option 1 for the LSO component are proposed to be scoped out of the</li> </ul>                                                                                                                                                                      |

| Topic                            | Impacts Proposed to be Scoped Out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | assessment during the construction, operational and/or decommissioning phases.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Chapter 13<br>Traffic and Access | <ul style="list-style-type: none"> <li>• Traffic and access effects on open spaces, recreational sites and shopping centres during construction, operational and decommissioning phases.</li> <li>• Traffic and access effects on people at home during the operational phase.</li> <li>• Traffic and access effects on people in workplaces during the operational and decommissioning phases.</li> <li>• Traffic and access effects on sensitive and/or vulnerable groups and sensitive locations during the operational phase.</li> <li>• Traffic and access effects on people walking and cycling during the operational phase.</li> <li>• Traffic and access effects on sites of ecological/nature conservation value and of tourist/visitor attraction during operational and decommissioning phases.</li> <li>• Traffic and access effects on vehicle drivers and passengers and public transport passengers during the operational phase.</li> <li>• Traffic and access effects on people horse riding during the decommissioning phase.</li> <li>• Maritime and riparian traffic effects associated with the operational and decommissioning phases.</li> <li>• Traffic and access effects on the rail network during the operational and decommissioning phases.</li> </ul> |
| Chapter 14 Noise and Vibration   | <ul style="list-style-type: none"> <li>• Noise and vibration effects from the operation of the proposed pumps (associated with the advanced water recycling plant, central service reservoir and western service reservoir components), operational traffic and pipeline components operation during the operational phase.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Chapter 15 Air Quality and Odour | <ul style="list-style-type: none"> <li>• At this stage, no air quality and odour impacts are proposed to be scoped out of the assessment during the construction, operational and / or decommissioning phases.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Chapter 16 Climate Change        | <ul style="list-style-type: none"> <li>• Indirect emissions from enabled development during construction, operation and decommissioning phases.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Topic                         | Impacts Proposed to be Scoped Out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <ul style="list-style-type: none"> <li>• Climate change impacts due to emission of greenhouse gases and the climate change risk assessment during the decommissioning phase.</li> <li>• Climate change effects on climate vulnerable receptors during the decommissioning phase.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Chapter 17<br>Socio-economics | <ul style="list-style-type: none"> <li>• Jobs and employment during the operational phase.</li> <li>• Skills and the labour market during the operational phase.</li> <li>• Maritime business enterprises during the operational phase.</li> <li>• Tourism is proposed to be scoped out during the operational phase.</li> <li>• Education and visitor facilities and local services during construction, operation and decommissioning phases (local services are considered in chapter 18 human health).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Chapter 18<br>Human Health    | <ul style="list-style-type: none"> <li>• Physical activity, risk taking behaviour and diet and nutrition (health related behaviours) during the construction, operational and decommissioning phases.</li> <li>• Housing and relocation (social environment) during the operational and decommissioning phases.</li> <li>• Educational and training and employment and income (economic environment) during the operational and decommissioning phases.</li> <li>• Land quality and radiation (bio-physical environment) during the construction, operational and decommissioning phases.</li> <li>• Community identity, culture, resilience and influence, and social participation, interaction and support (social environment) during the operational and decommissioning phases.</li> <li>• Housing, community safety and transport modes and connections (social environment) during the decommissioning phase.</li> <li>• Health and social care services and built environment (institutional and built environment) during the operational and decommissioning phases.</li> <li>• Maritime navigation during the operational and decommissioning phases.</li> </ul> |

| Topic                                          | Impacts Proposed to be Scoped Out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chapter 19<br>Ground<br>Conditions             | <ul style="list-style-type: none"> <li>• Disturbance and mobilisation of existing contamination during the operational and decommissioning phases.</li> <li>• Discovery of unexpected contamination during the operational and decommissioning phases.</li> <li>• Damage to construction materials from contamination or aggressive ground conditions during the construction, operational and decommissioning phases.</li> <li>• Damage to infrastructure, assets and structures from Geohazards and Ground Instability during the construction, operational and decommissioning phases.</li> <li>• Damage to designated geological designed sites during the construction, operational and decommissioning phases.</li> </ul> |
| Chapter 20<br>Agricultural Land<br>and Soils   | <ul style="list-style-type: none"> <li>• Soils supporting agriculture, soils supporting ecological habitats, soil carbon and agricultural land use during the operational phase.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Chapter 21<br>Materials and<br>Waste           | <ul style="list-style-type: none"> <li>• Allocated minerals sites during the construction phase.</li> <li>• All materials and waste impacts during the operational and decommissioning phases.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Chapter 22 Major<br>Accidents and<br>Disasters | <ul style="list-style-type: none"> <li>• Effects from earthquakes, landslides, tsunamis, volcanic activity, avalanches, tropical storms, sandstorms, wildfires, drought, animal/insect infestation, invasive non-native species, pandemics/epidemics, large scale migration or displacement, social care failures, civil unrest and strikes, aircraft crash onto assets, offshore shipping collision and structural/building collapse during dismantling for the relevant major accident and disaster receptors identified are proposed to be scoped out during construction, operational and decommissioning phases.</li> </ul>                                                                                                |

24.1.8 The application for a DCO for the Proposed Development will be made to the Planning Inspectorate on behalf of the SoS for determination in accordance with the Planning Act 2008. The ES, to be submitted in support of the DCO application, will be prepared in accordance with the SoS's Scoping Opinion.

## 25 Abbreviations

| Abbreviation | Definition                                                |
|--------------|-----------------------------------------------------------|
| AADT         | Annual Average Daily Traffic                              |
| AEP          | Annual Exceedance Probability                             |
| AEZ          | Archaeological Exclusion Zone                             |
| AIL          | Abnormal Indivisible Loads                                |
| ALC          | Agricultural Land Classification                          |
| APS          | Annual Population Survey                                  |
| AQMA         | Air Quality Management Area                               |
| AStGWF       | Areas Susceptible to Groundwater Flooding                 |
| AW           | Anglian Water                                             |
| AWRP         | Advanced Water Recycling Plant                            |
| BA           | Broads Authority                                          |
| BACI         | Before-After-Control-Impact                               |
| BDCS         | Biodiversity Data Collection Strategy                     |
| BQE          | Biological Quality Element                                |
| BAP          | Biodiversity Action Plan                                  |
| BDC          | Broadland District Council                                |
| BGL          | Below Ground Level                                        |
| BGS          | British Geological Survey                                 |
| BMV          | Best and Most Versatile                                   |
| BMWP         | Biological Monitoring Working Party                       |
| BNG          | Biodiversity Net Gain                                     |
| BOCC         | Birds of Conservation Concern                             |
| BRES         | Business Register and Employment Survey                   |
| BS           | British Standards                                         |
| CAA          | Civil Aviation Authority                                  |
| CBRN         | Chemical, Biological, Radiological and Nuclear            |
| CC           | Climate Change                                            |
| CCC          | Climate Change Committee                                  |
| CCRA         | Climate Change Risk Assessment                            |
| CCTV         | Closed Circuit Television                                 |
| Cefas        | Centre for Environment, Fisheries and Aquaculture Science |
| CEMP         | Construction Environmental Management Plan                |
| CF-bF        | Cromer Forest bed Formation                               |

| Abbreviation | Definition                                                  |
|--------------|-------------------------------------------------------------|
| CIEEM        | Chartered Institute of Ecology and Environmental Management |
| CIfA         | Chartered Institute for Archaeologists                      |
| CIRIA        | Construction Industry Research and Information Association  |
| CITiZAN      | Coastal and Intertidal Zone Archaeological Network          |
| CIWEM        | Chartered Institution of Water and Environmental Management |
| CL:AIRE      | Contaminated Land: Application in Real Environments         |
| CoCP         | Construction Code of Practice                               |
| COMAH        | Control of Major Accident Hazards                           |
| CoP          | Code of Practice                                            |
| COPD         | Chronic Obstructive Pulmonary Disease                       |
| COWRIE       | Collaborative Offshore Wind Research into the Environment   |
| CPRE         | Campaign for the Protection of Rural England                |
| CRW          | Concentrated Residual Water                                 |
| CSR          | Central Service Reservoir                                   |
| CTMP         | Construction Traffic Management Plan                        |
| CWS          | County Wildlife Site                                        |
| DBA          | Desk-Based Assessment                                       |
| DCO          | Development Consent Order                                   |
| Defra        | Department for Environment, Food and Rural Affairs          |
| DESNZ        | Department for Energy Security and Net Zero                 |
| DfT          | Department for Transport                                    |
| DMRB         | Design Manual for Roads and Bridges                         |
| DO           | Dissolved Oxygen                                            |
| EA           | Environment Agency                                          |
| EcIA         | Ecological Impact Assessment                                |
| EHV          | Extra High Voltage                                          |
| EIA          | Environmental Impact Assessment                             |
| EMODnet      | European Marine Observation and Data Network                |
| EPN          | Eastern Power Networks                                      |
| EPUK         | Environmental Protection UK                                 |
| EQS          | Environmental Quality Standard                              |
| ES           | Environmental Statement                                     |
| ESC          | East Suffolk Council                                        |
| ESDAL        | Electronic Service Delivery for Abnormal Loads              |



| Abbreviation | Definition                                                          |
|--------------|---------------------------------------------------------------------|
| ESF          | Environmental Stakeholder Forum                                     |
| ESW          | Essex and Suffolk Water                                             |
| EUNIS        | European Nature Information System                                  |
| EWC          | European Waste Catalogue                                            |
| FCD          | Field Capacity Days                                                 |
| FCWTP        | Framework Construction Worker Travel Plan                           |
| FEH          | Flood Estimation Handbook                                           |
| FMfP         | Flood Map for Planning                                              |
| FRA          | Flood Risk Assessment                                               |
| FWRA         | Foundation Works Risk Assessment                                    |
| GEP          | Good Ecological Potential                                           |
| GES          | Good Ecological Status                                              |
| GHG          | Greenhouse Gas                                                      |
| GI           | Ground Investigations                                               |
| GLVIA3       | Guidelines for Landscape and Visual Impact Assessment (3rd Edition) |
| GVA          | Gross Value Added                                                   |
| GWDTE        | Groundwater Dependent Terrestrial Ecosystem                         |
| GWP          | Global Warming Potential                                            |
| GYBC         | Great Yarmouth Borough Council                                      |
| ha           | Hectare                                                             |
| HDD          | Horizontal Directional Drilling                                     |
| HDPE         | High-Density Polyethylene                                           |
| HDV          | Heavy Duty Vehicle                                                  |
| HE           | Historic England                                                    |
| HEDBA        | Historic Environment Desk-Based Assessment                          |
| HGV          | Heavy Goods Vehicle                                                 |
| HLC          | Historic Landscape Character                                        |
| HMWB         | Heavily Modified Water Body                                         |
| HP           | High Pressure                                                       |
| HPI          | Habitat of Principal Importance                                     |
| HRA          | Habitats Regulations Assessment                                     |
| HSE          | Health & Safety Executive                                           |
| HV           | High Voltage                                                        |
| HWMB         | Heavily Modified Water Body                                         |
| IAQM         | Institute of Air Quality Management                                 |

| Abbreviation | Definition                                                  |
|--------------|-------------------------------------------------------------|
| ICB          | Integrated Care Board                                       |
| ICCI         | In-Combination Climate Impact                               |
| ICE          | Institution of Civil Engineers                              |
| ICES         | International Council for the Exploration of the Sea        |
| IDB          | Internal Drainage Board                                     |
| IEMA         | Institute of Environmental Management and Assessment        |
| IES          | Institution of Environmental Services                       |
| IFCA         | Inshore Fisheries Conservation Authority                    |
| IFP          | Instrument Flight Procedures                                |
| INNS         | Invasive Non-Native Species                                 |
| IoD          | Indices of Deprivation                                      |
| IP           | Intermediate Pressure                                       |
| ISEP         | Institute of Sustainability and Environmental Professionals |
| IUCN         | International Union for Conservation of Nature              |
| JNCC         | Joint Nature Conservation Committee                         |
| KT           | Kiloton                                                     |
| kV           | Kilovolt                                                    |
| LCA          | Landscape Character Assessment                              |
| LCRM         | Land Contamination Risk Management                          |
| LDV          | Light Duty Vehicle                                          |
| LEMP         | Landscape and Ecological Management Plan                    |
| LGV          | Light Goods Vehicle                                         |
| LHA          | Local Highway Authority                                     |
| LiDAR        | Light Detection and Ranging                                 |
| LLFA         | Lead Local Flood Authority                                  |
| LNG          | Liquefied Natural Gas                                       |
| LNR          | Local Nature Reserve                                        |
| LOAEL        | Lowest Observed Adverse Effect Level.                       |
| LoW          | List of Wastes                                              |
| LPA          | Local Planning Authority                                    |
| LPG          | Liquefied Petroleum Gas                                     |
| LRN          | Local Road Network                                          |
| LSO          | Long Sea Outfall                                            |
| LSOA         | Lower-Layer Super Output Area                               |
| LV           | Low Voltage                                                 |
| LVIA         | Landscape and Visual Impact Assessment                      |

| Abbreviation       | Definition                                                              |
|--------------------|-------------------------------------------------------------------------|
| LWS                | Local Wildlife Site                                                     |
| M&E                | Mechanical and Electrical                                               |
| MA&D               | Major Accidents and Disasters                                           |
| MAGIC              | Multi Agency Geographic Information for the Countryside                 |
| MAHP               | Major Accident Hazard Pipeline                                          |
| MCA                | Mineral Consultation Area                                               |
| MCZ                | Marine Conservation Zone                                                |
| Mg l <sup>-1</sup> | Milligrams per litre                                                    |
| MHCLG              | Ministry of Housing, Communities and Local Government                   |
| MHWS               | Mean High Water Springs                                                 |
| MIS                | Marine Isotope Stage                                                    |
| MI/d               | Megalitres per day                                                      |
| MMO                | Marine Management Organisation                                          |
| MMP                | Materials Management Plan                                               |
| MP                 | Medium Pressure                                                         |
| MPS                | Marine Policy Statement                                                 |
| MRA                | Mineral Resource Assessment                                             |
| MSA                | Mineral Safeguarding Area                                               |
| MSDC               | Mid Suffolk District Council                                            |
| MSOA               | Middle-layer Super Output Area                                          |
| MSW                | Municipal Solid Waste                                                   |
| Mt and Mtpa        | Megatonne (or million tonne) and Megatonne (or million tonne) per annum |
| MWPA               | Minerals and Waste Planning Authority                                   |
| NCC                | Norfolk County Council                                                  |
| NCCES              | Norfolk County Council Environmental Services                           |
| NCN                | National Cycle Network                                                  |
| NE                 | Natural England                                                         |
| NH <sub>3</sub>    | Ammonia                                                                 |
| NHER               | Norfolk Historic Environment Record                                     |
| NHLE               | National Heritage List for England                                      |
| NMHR               | National Marine Heritage Record                                         |
| NIS                | Network and Information Systems (Regulations)                           |
| NLS                | National Library of Scotland                                            |
| NMP                | National Mapping Programme                                              |
| NNR                | National Nature Reserve                                                 |

| Abbreviation      | Definition                                                   |
|-------------------|--------------------------------------------------------------|
| NO <sub>2</sub>   | Nitrogen Dioxide                                             |
| NO <sub>x</sub>   | Nitrogen Oxides                                              |
| NPPF              | National Planning Policy Framework                           |
| NPS               | National Policy Statement                                    |
| NPSWRI            | National Policy Statement for Water Resources Infrastructure |
| NRFA              | National River Flow Archive                                  |
| NRMM              | Non-Road Mobile Machinery                                    |
| NRR               | UK Government National Risk Register                         |
| NSIP              | Nationally Significant Infrastructure Project                |
| NVSR              | Noise and Vibration Sensitive Receptor                       |
| NVZ               | Nitrate Vulnerable Zone                                      |
| NWL               | Northumbrian Water Limited                                   |
| OCEMP             | Outline Construction Environmental Management Plan           |
| OCTMP             | Outline Construction Traffic Management Plan                 |
| OD                | Outer Diameter                                               |
| ODEMP             | Outline Decommissioning Environmental Management Plan        |
| ODTMP             | Outline Decommissioning Traffic Management Plan              |
| OLS               | Obstacle Limitation Surfaces                                 |
| ONS               | Office for National Statistics                               |
| OPRoWMP           | Outline Public Rights of Way Management Plan                 |
| OS                | Ordnance Survey                                              |
| OSEP              | Outline Skills and Employment Plan                           |
| OSPAR             | The Oskar (Oslo Paris) Convention                            |
| OSWMP             | Outline Site Waste Management Plan                           |
| PAD               | Protocol for Archaeological Discoveries                      |
| PAS               | Portable Antiquity Scheme                                    |
| PBDE              | Polybrominated diphenyl ethers                               |
| PINS              | The Planning Inspectorate                                    |
| PM <sub>10</sub>  | Particulate matter (PM <sub>10</sub> )                       |
| PM <sub>2.5</sub> | Particulate matter (PM <sub>2.5</sub> )                      |
| PPE               | Personal Protective Equipment                                |
| PPG               | Planning Practice Guidance                                   |
| ppt               | Parts per thousand                                           |
| PRA               | Preliminary Risk Assessment                                  |
| PRoW              | Public Right of Way                                          |

| Abbreviation | Definition                                             |
|--------------|--------------------------------------------------------|
| PSC          | Potential Source of Contamination                      |
| PV           | Photovoltaic                                           |
| RBMP         | River Basin Management Plan                            |
| RCP          | Representative Concentration Pathways                  |
| RHS          | River Habitat Survey                                   |
| RICT         | River Invertebrate Classification Tool                 |
| RNAG         | Reason for Not Achieving Good                          |
| RNLI         | Royal National Lifeboat Institution                    |
| RPG          | Registered Park and Garden                             |
| RSB          | Royal Society of Biology                               |
| RSL          | Relative Sea Level                                     |
| SAC          | Special Area of Conservation                           |
| SCADA        | Supervisory Control and Data Acquisition               |
| SCANs        | Small Cetaceans in the European Atlantic and North Sea |
| SCC          | Suffolk County Council                                 |
| SCCAS        | Suffolk County Council Archaeological Services         |
| SCTM         | Suffolk County Transport Model                         |
| SFRA         | Strategic Flood Risk Assessment                        |
| SgZ          | Drinking Water Safeguard Zone                          |
| SHA          | Strategic Highway Authority                            |
| SHER         | Suffolk Historic Environment Record                    |
| SMR          | Statutory Main River                                   |
| SNCI         | Site of Nature Conservation Interest                   |
| SNDC         | South Norfolk District Council                         |
| SNRHW        | Stable Non-Reactive Hazardous Wastes                   |
| SOAEL        | Significant Observed Adverse Effect Level              |
| SPA          | Special Protection Area                                |
| SPP          | Sustainable Procurement Plan                           |
| SPZ          | Source Protection Zone                                 |
| SR           | Service Reservoir                                      |
| SRN          | Strategic Road Network                                 |
| SRS          | Soil Resource Survey                                   |
| SSN          | Suffolk Strategic Network & Storage Enhancements       |
| SSSI         | Site of Special Scientific Interest                    |
| STW          | Sewage Treatment Works                                 |
| SuDS         | Sustainable Drainage Systems                           |

| Abbreviation       | Definition                                                       |
|--------------------|------------------------------------------------------------------|
| SWMP               | Site Waste Management Plan                                       |
| SWRTS              | Suffolk Water Recycling Transfer and Storage                     |
| SZC                | Sizewell C Nuclear Power Station                                 |
| TA                 | Transport Assessment                                             |
| tCO <sub>2</sub> e | Tonnes of Carbon Dioxide Equivalent                              |
| TEMP <sub>ro</sub> | Trip End Model Programme                                         |
| Tpa                | Tonnes per annum                                                 |
| TPO                | Tree Preservation Order                                          |
| TraC               | Transitional and Coastal                                         |
| UK                 | United Kingdom                                                   |
| UK-AIR             | UK Air Information Resource                                      |
| UKCEH              | UK Centre for Ecology and Hydrology                              |
| UKCP               | United Kingdom Climate Projections                               |
| UKCP18             | United Kingdom Climate Projects 2018                             |
| UKHO               | United Kingdom Hydrographic Office                               |
| UKPN               | UK Power Networks                                                |
| UKTAG              | UK Technical Advisory Group on the Water Framework Directive     |
| UNCLOS             | United Nations Convention on the Law of the Sea                  |
| UNESCO             | United Nations Educational, Scientific and Cultural Organization |
| UXB                | Unexploded Bomb                                                  |
| UXO                | Unexploded Ordnance                                              |
| WC I-VII           | Wetness class 1 to 7                                             |
| WFD                | Water Framework Directive                                        |
| WHO                | World Health Organisation                                        |
| WRC                | Water Recycling Centre                                           |
| WRMP24             | Water Resources Management Plan 2024                             |
| WRZ                | Water Resource Zone                                              |
| WSI                | Written Scheme of Investigation                                  |
| WSR                | Western Service Reservoir                                        |
| WTW                | Water Treatment Works                                            |
| ZoI                | Zone of Influence                                                |
| ZTV                | Zone of Theoretical Visibility                                   |

## 26 Glossary

| Term                                     | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity data                            | To calculate GHG emissions of the Proposed Development, it is necessary to gather data on the activities that will occur. Activity data consists of information that defines and describes the size, magnitude and physical nature of the Proposed Development. It will take many different forms, including material specifications and quantity, energy and water demand, waste generation, transportation distances and modes, and works techniques/technologies. |
| Aggregates                               | Minerals which are used primarily to support the construction industry including soft sand, sand and gravel and crushed rock.                                                                                                                                                                                                                                                                                                                                        |
| Agricultural Land Classification         | The system used in England and Wales to assess the quality of agricultural land according to its physical and climatic characteristics. Land is graded from Grade 1 (excellent) to Grade 5 (very poor).                                                                                                                                                                                                                                                              |
| Abnormal Indivisible Loads               | A large or heavy load that cannot be divided into smaller parts for transport without undue expense or risk of damage. These loads often require special permits and route planning due to their size or weight exceeding standard legal limits.                                                                                                                                                                                                                     |
| Air Quality Management Area              | Areas within a local authority's boundary that are identified as areas where Air Quality Objectives are not likely to be achieved.                                                                                                                                                                                                                                                                                                                                   |
| Air Quality Objectives                   | Defined levels of air quality and maximum pollution limits as specified in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007.                                                                                                                                                                                                                                                                                                         |
| As Low as Reasonably Practicable (ALARP) | Involves weighing a risk against the trouble, time, and money needed to control it. Describes the level to which risks should be controlled.                                                                                                                                                                                                                                                                                                                         |
| Allocated mineral sites                  | Allocated mineral sites include mineral deposits specifically identified in a Local Plan as those that would be mined or extracted. This definition also encompasses operational minerals extraction sites; as long as a site remains listed in the adopted Mineral or Minerals and Waste Local Plan, it is treated as an allocation regardless of whether it is unworked, partly worked, or fully operational.                                                      |
| Ambient sound                            | Totally encompassing sound in a given situation at a given time, usually composed of sound from many                                                                                                                                                                                                                                                                                                                                                                 |

| Term                                                    | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                         | sources near and far. Comprises of the residual sound and the specific sound when present.                                                                                                                                                                                                                                                                                                                                                                |
| Ambient Sound Level ( $L_a = L_{Aeq,T}$ )               | Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.                                                                                                                                                                                                                           |
| Ammonia ( $NH_3$ )                                      | Ammonia is a colourless non-flammable gas, which stays in the atmosphere for a few hours. However, it can mix with other gases to form particulate matter, which can exist for several days                                                                                                                                                                                                                                                               |
| Annual Average Daily Traffic                            | The average number of vehicles passing a specific point on a road per day, calculated over an entire year.                                                                                                                                                                                                                                                                                                                                                |
| Annual Exceedance Probability                           | The probability that a certain flood event will be equalled or exceeded in any given year.                                                                                                                                                                                                                                                                                                                                                                |
| Aquifer                                                 | A subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater.                                                                                                                                                                                                                                    |
| Archaeological exclusion zone                           | An exclusion zone imposed for the in-situ protection of known archaeological sites or geophysical anomalies of high or medium archaeological potential.                                                                                                                                                                                                                                                                                                   |
| Archaeological remains                                  | The material remains of human activity from the earliest periods of human evolution to the present. These could be buried traces of human activities, archaeological deposits, sites which are visible above ground, or moveable artefacts. Archaeological remains can encompass the remains of buildings, structures, earthworks and landscapes, human, animal, or plant remains, or other organic material produced by or affected by human activities. |
| Areas of future technical marine aggregates opportunity | The areas defined as high potential aggregate resource are based on mapping undertaken by British Geological Survey on behalf of The Crown Estate and identify the locations with the greatest potential for aggregate resource, taking into account the geological processes that created them. In turn, these areas identify where future exploration is most likely to occur.                                                                          |
| A-Weighted Decibel (dBA)                                | A decibel level that has been corrected for the A-Weighting curve.                                                                                                                                                                                                                                                                                                                                                                                        |



| Term                                   | Definition                                                                                                                                                                                                                                  |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A-Weighting                            | Octave band and 1/3 octave band filters that correlate to the response of the human hearing system to sound pressure levels at different frequencies.                                                                                       |
| Backfilling                            | A recovery operation where suitable waste is used for reclamation purposes in excavated areas or for engineering purposes in landscaping and where the waste is a substitute for non-waste materials.                                       |
| Background sound                       | The level of sound measured in the absence of extraneous noise sources.                                                                                                                                                                     |
| Background sound level ( $L_{A90,T}$ ) | A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using a fast time-weighting and quoted to the nearest whole number of decibels.             |
| Baseline conditions                    | The existing state of the environmental receptors and resources within the study areas prior to the construction and operation of the Proposed Development.                                                                                 |
| Baseline data                          | Data used to describe the current conditions of the environment, against which future predictions can be made.                                                                                                                              |
| Bedrock geology                        | Solid rock formation underlying superficial deposits.                                                                                                                                                                                       |
| Best and Most Versatile land           | Agricultural land classified as Grade 1, Grade 2 and Subgrade 3a under the ALC system.                                                                                                                                                      |
| Best overall environmental outcome     | A departure from the waste hierarchy which delivers better overall environmental outcomes.                                                                                                                                                  |
| Bill of quantities                     | A document containing details on the volumes of excavated arisings from, and materials required for, a development. Also 'Schedule of Rates'.                                                                                               |
| Biodiversity Net Gain                  | Biodiversity net gain is a way of creating and improving natural habitats. Biodiversity Net Gain (BNG) makes sure development has a measurably positive impact ('net gain') on biodiversity, compared to what was there before development. |
| Bore instability                       | A condition during drilling operations where the borehole becomes unstable, potentially leading to collapse, deformation or loss of drilling fluid.                                                                                         |
| Break out/frac out                     | Unplanned losses of drilling fluids.                                                                                                                                                                                                        |
| British Geological Survey              | A public sector organisation responsible for advising the UK government on all aspects of geoscience as well as providing impartial geological advice to industry, academia and the public.                                                 |

| Term                                          | Definition                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Built heritage                                | Architectural, designed or other structures with a significant historical value. These could include structures that have no aesthetic appeal or structures not usually thought of as ‘buildings’, such as milestones or bridges.                                                                                                                                        |
| Buried pipeline infrastructure                | Pipeline assets installed below ground level and reinstated following construction.                                                                                                                                                                                                                                                                                      |
| Carbon Budget                                 | The cumulative amount of CO <sub>2</sub> emissions permitted over a period to remain within a specific global temperature target.                                                                                                                                                                                                                                        |
| Carbon Dioxide Equivalent (CO <sub>2</sub> e) | A standardized unit for measuring greenhouse gases, expressing the impact of different gases in terms of the amount of CO <sub>2</sub> that would have the same global warming potential over a specified time horizon.                                                                                                                                                  |
| Carbon emissions                              | Shorthand for emissions of any of the greenhouse gases that contribute to climate change.                                                                                                                                                                                                                                                                                |
| Carbon emissions factor                       | Carbon emission factors are a value for ‘carbon emissions per unit of activity’. Examples of this are: <ul style="list-style-type: none"> <li>• HGV: kg CO<sub>2</sub>e / tonne.km.</li> <li>• UK electricity grid: kg CO<sub>2</sub>e / kWh.</li> <li>• Concrete: kg CO<sub>2</sub>e / tonne.</li> </ul>                                                                |
| Catchment                                     | The area of land from which precipitation drains into a specific river, lake, or reservoir.                                                                                                                                                                                                                                                                              |
| Closed-Circuit Television (CCTV)              | Video surveillance system transmitting signals to a limited set of monitors for security or monitoring purposes.                                                                                                                                                                                                                                                         |
| Circular economy                              | A circular economy is an alternative to a traditional linear economy (of make, use, dispose) in which we keep resources in use for as long as possible; extract the maximum value from them while in use; recover and regenerate products and materials at the end of life; and keep products, components and materials at their highest utility and value at all times. |
| Climate                                       | The general weather conditions prevailing over a long period of time. Climate change will see trends in the climate conditions changing (seasonal averages and extremes).                                                                                                                                                                                                |
| Climate change adaptation                     | The process that a receptor or project has to go through so that it maintains its resilience to climate change. In the case of a development project, adaptation can be embedded in the design to account for future climate conditions, or the project can introduce measures so that it retains its resilience.                                                        |

| Term                                          | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | (i.e. the project adapts) to future climate conditions. Environmental receptors will adapt to climate change in varying degrees depending on how vulnerable they are to climate.                                                                                                                                                                                                                                                                                                       |
| Climate change resilience                     | The resilience of something is a measure of its ability to respond to changes it experiences. If a receptor or a project has good climate change resilience, it is able to respond to the changes in climate in a way that ensures it retains much of its original function and form. A receptor or project that has poor climate change resilience will lose much of its original function or form as the climate changes.                                                            |
| Climate projection                            | A possible outcome defined by modelling of climate variables to give a possible outcome. This is in contrast to a prediction which is a statement of probable change.                                                                                                                                                                                                                                                                                                                  |
| Commercial waste                              | Waste from premises used wholly or mainly for the purposes of a trade or business or the purposes of sport, recreation or entertainment. N.B. this excludes industrial waste defined below.                                                                                                                                                                                                                                                                                            |
| Construction                                  | Any activity involved with the provision of a new structure (or structures), its modification or refurbishment.                                                                                                                                                                                                                                                                                                                                                                        |
| Construction materials                        | Physical substances from primary (virgin) and non-primary (i.e. reused, secondary, and recycled) sources that are used to deliver construction.                                                                                                                                                                                                                                                                                                                                        |
| Construction, demolition and excavation waste | Arisings and waste from the demolition of buildings and structures, site preparation and clearance, remediation, excavation and construction activities.                                                                                                                                                                                                                                                                                                                               |
| Contaminated land                             | As defined under Part 2a of the Environmental Protection Act 1990, ' <i>land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that – (a) significant harm is being caused or there is a significant possibility of such harm being caused; or (b) significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused</i> '. |
| Critical raw materials                        | Materials that are considered to have high importance within the UK economy, but where security of supply is at great risk.                                                                                                                                                                                                                                                                                                                                                            |
| Decibel (dB)                                  | A logarithmic unit used to describe the ratio between the measured level and a reference level of 0dB. The ratio can be sound pressure, intensity or power. The                                                                                                                                                                                                                                                                                                                        |

| Term                            | Definition                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | reference value for sound pressure is 20 µPa and for sound power is 1pW.                                                                                                                                                                                                                                                                                                                                     |
| Decommissioning                 | The process undertaken when infrastructure permanently ceases operation, including making infrastructure safe and either removing it or leaving it in situ, as appropriate.                                                                                                                                                                                                                                  |
| Demolition                      | Any activity involved with the removal of an existing structure (or structures). This may also be referred to as de-construction or dismantling, specifically when a building is to be removed a small part at a time.                                                                                                                                                                                       |
| Deposition (dust)               | The vertical passage of a substance (e.g. dust) to a surface or the ground.                                                                                                                                                                                                                                                                                                                                  |
| Designated heritage asset       | Heritage assets that receive a greater degree of protection within the planning system due to their significant heritage interest. Official designation provides statutory protection. Categories of designated heritage assets include world heritage sites (designated by UNESCO), scheduled monuments, listed buildings, registered park and gardens, and registered battlefields and conservation areas. |
| Development Consent Order (DCO) | The means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIPs) under the Planning Act 2008.                                                                                                                                                                                                                                                        |
| Diadromous                      | Fish that migrate regularly between fresh water and the sea.                                                                                                                                                                                                                                                                                                                                                 |
| Dichlorination                  | Dichlorination is a chemical reaction in which exactly two chlorine atoms are introduced into a molecule.                                                                                                                                                                                                                                                                                                    |
| Disaster                        | A man-made hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation that meets the definition of a major accident.                                                                                                                                                                                                                 |
| Disposal                        | Any operation which is not recovery, even where the operation has, as a secondary consequence, the reclamation of substances or energy (e.g. landfilling, incineration).                                                                                                                                                                                                                                     |
| Drinking Water Safeguard Zone   | Area established around public water supplies where additional pollution control measures are needed to reduce and prevent pollution of water abstracted for drinking water supplies.                                                                                                                                                                                                                        |
| Dust                            | Solid particles that are suspended in air or have settled out onto a surface after having been suspended in air. The terms dust and particulate matter (PM) are often used interchangeably,                                                                                                                                                                                                                  |

| Term                                                                  | Definition                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                       | although in some contexts one term tends to be used in preference to the other. In this assessment the term 'dust' has been used to include the particles that give rise to soiling, and to human health (i.e. PM <sub>10</sub> or PM <sup>2.5</sup> ) and ecological effects. Note: this is different from the definition given in BS 6069-2:1994, where dust refers to particles up to 75µm in diameter. |
| Earthworks                                                            | Covers the processes of soil-stripping, ground-leveling, excavation and landscaping.                                                                                                                                                                                                                                                                                                                       |
| Ecological Impact Assessment                                          | The process of identifying, quantifying, and evaluating the potential effects of development-related or other proposed actions on habitats, species, and ecosystems.                                                                                                                                                                                                                                       |
| Employment                                                            | The number of people in paid work. Within this assessment employment reflects the number of jobs providing work (employment) for local residents.                                                                                                                                                                                                                                                          |
| Enhancements                                                          | Measures that go beyond mitigation to deliver additional environmental or community benefits. Unlike mitigation, which is implemented to avoid, prevent, reduce or, where possible, offset identified adverse effects, enhancements are voluntary actions intended to create a net positive outcome.                                                                                                       |
| Environmental Statement (ES)                                          | A document setting out the assessment of the likely significant effects of a project on the environment, submitted with the application for consent.                                                                                                                                                                                                                                                       |
| Equivalent Continuous A-Weighted Sound Pressure Level ( $L_{Aeq,T}$ ) | Value of the time-averaged A-weighted sound pressure level, in decibels (dB), of a continuous steady sound for the duration of the specified time interval, T.                                                                                                                                                                                                                                             |
| Electronic Service Delivery for Abnormal Loads (ESDAL)                | An online system used in the UK to notify authorities and plan routes for transporting abnormal loads. It helps hauliers comply with legal requirements by informing police, highway authorities, and structure owners about movements.                                                                                                                                                                    |
| Essential infrastructure                                              | Essential transport/utility infrastructure which has to cross or be located within a flood risk area for operational reasons.                                                                                                                                                                                                                                                                              |
| Eutrophic                                                             | Characterised by an abundant accumulation of nutrients that support a dense growth of algae and other organisms, the decay of which depletes the shallow waters of oxygen in summer.                                                                                                                                                                                                                       |
| Excavated arisings                                                    | For the purposes of this assessment, this term is restricted to those materials that fall within the scope of and meet the reuse/exemption criteria set out in                                                                                                                                                                                                                                             |

| Term                                          | Definition                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | relevant waste exemptions, the Waste Framework Directive or the CL:AIRE Definition of Waste: Development Industry Code of Practice. Any material which it is not considered to fall within the above definition would be defined as waste.                                                                   |
| Expansive Study Area                          | Extends to the availability of construction materials, and capacity of waste management infrastructure and remaining landfill void, within a defined (for example, a mineral and waste planning) region, or – as appropriate – across multiple regions.                                                      |
| Field Capacity Days                           | A measure of the number of days in an average year when soils are at or above field capacity and therefore susceptible to structural damage from trafficking and handling.                                                                                                                                   |
| Free-Field Level                              | The sound pressure level measured away from any reflective surfaces.                                                                                                                                                                                                                                         |
| Frequency                                     | The number of cycles of pressure fluctuations within a given period of time. Measured in Hertz.                                                                                                                                                                                                              |
| Freshwater Biodiversity                       | The scientific study of the relationships between organisms and their environment in freshwater systems (rivers, lakes, ponds).                                                                                                                                                                              |
| Good Agricultural and Environmental Condition | Standards that previously formed part of the agricultural cross-compliance regime. Good Agricultural and Environmental Condition requirements were intended to promote the sustainable management of agricultural land, including the protection of soils, water resources, habitats and landscape features. |
| Geohazards                                    | A natural geological process that impacts adversely on people and the built environment.                                                                                                                                                                                                                     |
| Global Warming Potential                      | A metric that compares the radiative forcing of a greenhouse gas to that of CO <sub>2</sub> over a defined period (commonly 20, 100, or 500 years), allowing cross-gas comparison of climate impacts.                                                                                                        |
| Good Ecological Potential                     | The status classification for a Heavily Modified Water Body (HMWB) or Artificial Water Body (AWB) under the WFD. It represents the best possible ecological quality that can be achieved without significantly compromising the water body's specified use (e.g., flood defence).                            |
| Good Ecological Status                        | The status classification for a natural water body under the WFD. It is defined as a slight deviation from the biological, structural, and chemical                                                                                                                                                          |



| Term                                     | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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|                                          | characteristics that would be expected in undisturbed conditions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Greenhouse Gases                         | The main six gaseous compounds that absorb infrared radiation and traps heat in the atmosphere.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Groundwater                              | Water that is in the ground. This usually refers to water in the saturated zone below the water table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Haul road                                | A term for roads designed for heavy or bulk transfer of materials by construction vehicles.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Hazard                                   | Something with the potential to cause harm. The harm is defined as injury or damage to the health of people, or damage to property or the environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Hazardous waste                          | Defined in line with Article 3(2) of the Waste Framework Directive (Council Directive 2008/98/EC) as: <i>'waste which displays one or more of the hazardous properties listed in Annex III' of the Directive.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Horizontal Directional Drilling          | A trenchless construction technique used to install underground pipelines by drilling a bore path between entry and exit points.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Horizontal Directional Drilling frac-out | An unintended release of drilling fluid to the ground surface or waterbody during Horizontal Directional Drilling, caused by loss of containment within the bore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Health                                   | World Health Organisation (WHO) definition, in that it <i>'...is a state of complete physical, social and mental wellbeing and not simply the absence of disease or infirmity.'</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Heavy Duty Vehicle                       | Vehicle with a gross weight of more than 3.5 tonnes and buses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Heritage asset                           | The National Policy Statement for Water Resources Infrastructure (NPSWRI) defines heritage assets as <i>'those elements of the historic environment identified as having a degree of significance meriting consideration in planning decisions because of their historic interest.... Heritage assets may be buildings, monuments, sites, places, areas or landscapes, or any combination of these... The interest may be historic, archaeological, architectural or artistic. Significance derives not only from a heritage asset's physical presence, but also from its setting'</i> (NPSWRI paragraph 4.8.3).<br>Heritage assets may be designated or non-designated. |

| Term                          | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| Hertz (Hz)                    | The unit of frequency or pitch of a sound. One hertz is equal to one cycle per second.                                                                                                                                                                                                                                                                                                                                                                        |
| Highly vulnerable development | Police, ambulance and fire stations and telecommunications installations required to be operational during flooding. Also includes basement dwellings, caravans/mobile homes/park homes used as permanent residences and installations requiring hazardous substances consent.                                                                                                                                                                                |
| Historic England              | The national curatorial body that provides guidance and advice to the regulator the Marine Management Organisation (MMO) pre- and post-consent.                                                                                                                                                                                                                                                                                                               |
| Historic environment          | The historic environment includes all aspects of the environment that holds archaeological, historical or cultural significance.                                                                                                                                                                                                                                                                                                                              |
| Historic Environment Record   | The National Policy Statement for Water Resources Infrastructure (NPSWRI) defines the Historic Environment Record as ' <i>Historic Environment Records are information services maintained and updated by (or on behalf of) local authorities and National Park Authorities with a view to providing access to comprehensive and dynamic resources relating to the historic environment of an area for public benefit and use.</i> ' (NPSWRI paragraph 4.8.8) |
| Historic landscape            | The current landscape, whose character is the consequence of the action and interaction of natural and/or human factors.                                                                                                                                                                                                                                                                                                                                      |
| Historic seascape character   | The attributes that contribute to the formation of the historic character of the seascape.                                                                                                                                                                                                                                                                                                                                                                    |
| Historical Landfill           | Locations where there are records of waste being received to be buried but which are now closed. This information is collated from data held by Local Authorities, the former Department of the Environment, British Geological Survey and the Environment Agency suspended authorised landfill licences.                                                                                                                                                     |
| Impacts (air quality)         | The changes in airborne concentrations and/or dust deposition. A scheme can have an 'impact' on airborne dust without having any 'effects', for instance if there are no receptors to experience the impact.                                                                                                                                                                                                                                                  |
| Important Ecological Feature  | Ecological features (habitats, species, ecosystems) that are considered sufficiently important (e.g., of Local importance or above) to warrant detailed assessment in the Ecological Impact Assessment.                                                                                                                                                                                                                                                       |



| Term                               | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| In situ                            | In situ refers to undisturbed archaeological remains (features, artefacts, deposits) that are found and remain in their original location. The term may refer to 'preserving the archaeological remains in situ'.                                                                                                                                                                                                                                                                                                |
| In-channel habitat                 | The physical habitat features within the river channel itself (below the bank top), such as flow types, substrate (gravel, silt), and aquatic vegetation structure.                                                                                                                                                                                                                                                                                                                                              |
| Incidental extraction              | Incidental extraction refers to the often unintentional removal of mineral resources during a non-mineral's development, such as the construction of infrastructure projects. It is a subordinate activity in which mineral recovery occurs as a secondary outcome of the primary construction project.                                                                                                                                                                                                          |
| In-combination climate impact      | When a projected future climate impact (e.g. increase in temperatures) interacts with an effect identified by another topic and exacerbates its impact.                                                                                                                                                                                                                                                                                                                                                          |
| Industrial waste                   | Waste from any of the following premises - (a) any factory; (b) any premises used for the purposes of, or in connection with, the provision to the public of transport services by land, water or air; (c) any premises used for the purposes of, or in connection with, the supply to the public of gas, water or electricity or the provision of sewerage services; or (d) any premises used for the purposes of, or in connection with, the provision to the public of postal or telecommunications services. |
| Inert waste                        | A sub-category of non-hazardous waste, that that does not undergo any significant physical, chemical, or biological transformations when deposited in a landfill.                                                                                                                                                                                                                                                                                                                                                |
| Intertidal                         | The area of foreshore above water level at low-tide, and below water level at high tide.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Invasive Non-Native Species (INNS) | Species that have been introduced (deliberately or accidentally) by human activities to an area where they do not naturally occur and which cause damage to the environment, economy, or health.                                                                                                                                                                                                                                                                                                                 |
| Job                                | The number of positions/roles supported.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Key material                       | Construction or operational materials which, by weight, constitute the majority of material required to deliver a project.                                                                                                                                                                                                                                                                                                                                                                                       |
| LAm <sub>ax</sub>                  | The maximum A-weighted level measured during a given time period.                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Term                                          | Definition                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Landfill capacity                             | The known, forecast or estimated remaining landfill void space, either individually, regionally or nationally; generally measured in cubic metres or tonnes.                                                                                                                                                                          |
| Landscape effects                             | Changes to the landscape as a resource, including physical changes to its fabric, aesthetic or perceptual qualities, and landscape character.                                                                                                                                                                                         |
| Land-take                                     | Temporary or permanent occupation of land required for the construction, operation or maintenance of a development.                                                                                                                                                                                                                   |
| Less vulnerable development                   | Where temporary disruption from flooding is acceptable and the development remains safe.                                                                                                                                                                                                                                              |
| Light Duty Vehicle                            | Vehicle with a gross weight of no more than 3.5 tonnes.                                                                                                                                                                                                                                                                               |
| Limit Value                                   | Limit values are legally binding parameters that must not be exceeded. Limit values are set for individual pollutants and are made up of a concentration value, an averaging time over which it is to be measured, the number of exceedances allowed per year, if any, and a date by which it must be achieved.                       |
| Lowest Observed Adverse Effect Level          | This is the noise level above which adverse effects on health and quality of life can be detected.                                                                                                                                                                                                                                    |
| Local Air Quality Management                  | A process that requires local authorities across the UK to review, assess and manage the air quality within their geographical areas.                                                                                                                                                                                                 |
| Local Geological Sites                        | A non-statutory designation for regionally important geological and geomorphological sites that have been identified as being of importance locally.                                                                                                                                                                                  |
| Local Wildlife Site                           | Local Wildlife Sites are sites designated locally for their substantive nature conservation value. They are defined areas, identified and selected for their nature conservation value, based on important, distinctive and threatened habitats and species.                                                                          |
| Lower Layer Super Output Area                 | A geographic unit used in England and Wales for statistical reporting. Lower Layer Super Output Areas (LSOAs) are designed to improve the reporting of small area data by grouping populations of approximately 1,000 - 3,000 people, allowing for consistent analysis of local demographics, deprivation, and socio-economic trends. |
| Landscape and Visual Impact Assessment (LVIA) | A process for assessing likely significant effects of a development on landscape and visual receptors.                                                                                                                                                                                                                                |
| Macroinvertebrate                             | Small aquatic animals without a backbone that can be seen with the naked eye (e.g., snails, beetles,                                                                                                                                                                                                                                  |

| Term                              | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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|                                   | mayfly larvae, crustaceans). They are key indicators of water quality and ecosystem health.                                                                                                                                                                                                                                                                                                                                                                                |
| Macrophyte                        | Aquatic plants that grow in or near water and are either emergent (growing out of water), submerged (underwater), or floating.                                                                                                                                                                                                                                                                                                                                             |
| Made ground                       | Anthropogenic ground in which the material has been placed without engineering control and/or manufactured by man in some way, such as through crushing or washing, or arising from an industrial process.                                                                                                                                                                                                                                                                 |
| Major accident                    | An event (for instance, train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare and/or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e. contractors) to manage. Major accidents can be caused by disasters resulting from both man-made and natural hazards.                                                        |
| Marine and intertidal archaeology | This includes aircraft remains identified at sea alongside historic wrecks and features, as well as deposits of archaeological interest located in the intertidal zone.                                                                                                                                                                                                                                                                                                    |
| Material resources                | Material resources includes solid materials and products from primary, secondary, recycled, sustainable and renewable sources, and the use of site-won/imported excavated materials.                                                                                                                                                                                                                                                                                       |
| Materials                         | Substances and objects which will be used during any lifecycle stage of a development.                                                                                                                                                                                                                                                                                                                                                                                     |
| Materials Management Plan         | A Materials Management Plan (MMP) is a document used in construction and environmental projects to manage the reuse of materials, such as soil and made ground, without needing an environmental permit. The MMP ensures that materials are reused in a way that protects human health and the environment and is suitable for the intended use. It is prepared in accordance with the CL:AIRE voluntary Definition of Waste: Development Industry Code of Practice (CoP). |
| Mean High Water Springs           | The average pair of successive high waters during spring tides, typically occurring every 14 days when the tidal range is greatest.                                                                                                                                                                                                                                                                                                                                        |
| Migratory Fish                    | Fish species that migrate between different environments (e.g., between sea and river) to                                                                                                                                                                                                                                                                                                                                                                                  |

| Term                           | Definition                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|                                | complete their life cycle (e.g., European Eel, Sea Trout, Lamprey).                                                                                                                                                                                                                                                                                                                                                                   |
| Mineral Consultation Area      | An area identified by a Minerals and Waste Planning Authority within which consultation is required on certain non-mineral development proposals that could sterilise safeguarded mineral resources or constrain the operation of existing or safeguarded mineral sites and infrastructure. A Mineral Consultation Area does not necessarily indicate the presence of a mineral resource or form part of the safeguarded site itself. |
| Mineral resource               | Natural concentrations of minerals or, in the case of aggregates, bodies of rock that are, or may become, of potential economic interest.                                                                                                                                                                                                                                                                                             |
| Mineral Resource Assessment    | A proportionate technical study that evaluates the presence, nature and extent of mineral deposits within a defined area. It assesses the potential for economic extraction by considering geological confidence and modifying factors such as environmental, legal and social constraints. In land-use planning, a Mineral Resource Assessment (MRA) helps inform and support decisions on the feasibility of prior extraction.      |
| Mineral Safeguarding Area      | An area designated by a minerals and waste planning authority which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development.                                                                                                                                                                                                                             |
| Mineral Soil                   | Soil containing relatively low concentrations of organic matter and dominated by mineral particles.                                                                                                                                                                                                                                                                                                                                   |
| Mitigation                     | Measures designed to avoid, reduce, or offset adverse landscape and visual effects during construction, operation, and decommissioning phases.                                                                                                                                                                                                                                                                                        |
| Mitigation hierarchy           | A sequential process of avoiding adverse effects in the first instance, reduce them where avoidance is not possible, and as a last resort providing compensation.                                                                                                                                                                                                                                                                     |
| Mitigation measures            | Actions that are taken to reduce, prevent or compensate for adverse effects of a development.                                                                                                                                                                                                                                                                                                                                         |
| Middle-layer Super Output Area | A geographic unit used in England and Wales for statistical reporting. Middle-layer Super Output Areas (MSOAs) are designed to improve the reporting of small area data by grouping populations of approximately 5,000 - 15,000 people, allowing for                                                                                                                                                                                  |

| Term                                                 | Definition                                                                                                                                                                                                                                                                                                       |
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|                                                      | consistent analysis of local demographics, deprivation, and socio-economic trends. MSOAs are built from groups of contiguous Lower Layer Super Output Area (LSOAs).                                                                                                                                              |
| Municipal solid waste                                | Waste from households and waste which, because of its nature or composition, is similar to waste from households. As well as waste collected by local authorities, municipal waste includes commercial and industrial waste that is similar in nature to household waste and is collected by the private sector. |
| Nationally Significant Infrastructure Project (NSIP) | Major infrastructure developments in England and Wales (such as energy, transport, water, and waste projects) that bypass normal local planning requirements and are consented via a Development Consent Order (DCO).                                                                                            |
| Nitric Oxide (NO)                                    | Primarily formed during the combustion of fossil fuels, NO can react with other gases in the atmosphere to form NO <sub>2</sub> .                                                                                                                                                                                |
| Nitrogen Dioxide (NO <sub>2</sub> )                  | An air pollutant measured in respect of the Department for Environment, Food, and Rural Affairs' air quality objectives for the protection of human health. Nitrogen dioxide is a gas that is mainly produced during the combustion of fossil fuels.                                                             |
| Nitrogen Oxides (NO <sub>x</sub> )                   | Refers to nitric oxide (NO) and nitrogen dioxide (NO <sub>2</sub> ), both of which are mainly formed during the combustion of fossil fuels.                                                                                                                                                                      |
| Non-designated heritage asset                        | Heritage assets that are of historic, architectural, artistic and/or archaeological interest and are a material consideration in the determination of planning applications but not meet the criteria to be designated.                                                                                          |
| Non-hazardous waste                                  | Non-hazardous waste can have the following two meanings: all waste which does not meet the above definition of 'hazardous' and, for the purpose of landfill regulation, waste which is neither hazardous nor inert.                                                                                              |
| Non-Road Mobile Machinery                            | Any mobile machine, item of transportable industrial equipment, or vehicle - with or without bodywork - that is not intended for carrying passengers or goods on the road and is installed with an internal combustion engine.                                                                                   |
| Order Limits                                         | The extent of land required for the construction, operation, and maintenance of the Proposed                                                                                                                                                                                                                     |

| Term                            | Definition                                                                                                                                                                                                                                                         |
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|                                 | Development, within which the Development Consent Order (DCO) would apply.                                                                                                                                                                                         |
| Ordinary watercourses           | Include a variety of channels such as rivers, streams, ditches and drains. These are generally smaller, minor watercourses not under the jurisdiction of the Environment Agency.                                                                                   |
| Organic-Mineral Soil            | Soil containing elevated organic matter content but not meeting the definition of peat.                                                                                                                                                                            |
| Palaeoenvironmental deposits    | The organic and inorganic remains used to reconstruct past environments, climate and vegetation and how they interacted with human activity.                                                                                                                       |
| Particulate matter (PM)         | Airborne particulate matter is made up of a collection of solid and/or liquid materials of various sizes that range from a few nanometres in diameter (approximately the size of a virus) to around 100 micrometres (approximately the thickness of a human hair). |
| Particulate matter (PM10)       | Particles with an aerodynamic diameter of 10 microns or less.                                                                                                                                                                                                      |
| Particulate matter (PM2.5)      | Particles with an aerodynamic diameter of 2.5 microns or less.                                                                                                                                                                                                     |
| Peat Soil                       | Soil comprising more than 50% organic matter and formed from the accumulation of partially decomposed plant material.                                                                                                                                              |
| Percentile Level ( $L_{AN,T}$ ) | The A-Weighted Sound Pressure Level which is exceeded for N% of the specified time interval.                                                                                                                                                                       |
| Phytobenthos                    | Microscopic plants (mostly algae and diatoms) that live attached to submerged surfaces such as stones and plants. Also referred to separately as diatoms or algae.                                                                                                 |
| Planform                        | The river outline as viewed from above.                                                                                                                                                                                                                            |
| Primary (inherent) mitigation   | Modifications to the location or design of the development made during the preapplication phase that are an inherent part of a development, and do not require additional action to be taken.                                                                      |
| Primary materials               | Physical substances from non-renewables sources, i.e. those that cannot or would not be replaced in short (non-geological) periods of time. Also referred to as 'virgin' materials.                                                                                |
| Principal aquifer               | Rock layers that provide significant quantities of drinking water, and water for business needs. They also support rivers, lakes and wetland.                                                                                                                      |

| Term                                             | Definition                                                                                                                                                                                                                                                                |
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| Public Rights of Way                             | Legally protected paths that allow the public to travel across land, including footpaths, bridleways, and byways.                                                                                                                                                         |
| Proximity principle                              | The requirement to treat and/or dispose of wastes in reasonable proximity to their point of generation.                                                                                                                                                                   |
| Q95                                              | Flow that is exceeded 95% of the time.                                                                                                                                                                                                                                    |
| Ramsar site                                      | A wetland site designated to be of international importance under the Ramsar Convention, particularly as waterfowl habitat.                                                                                                                                               |
| Receptor                                         | A feature that may be affected by the Proposed Development and is therefore considered within the EIA assessment.                                                                                                                                                         |
| Recycled aggregates                              | Aggregates that are typically derived from reprocessing materials previously used in construction, such as road planings, railway ballast, crushed concrete or masonry from construction and demolition activities.                                                       |
| Recycling                                        | Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. Recycling does not include energy recovery nor the reprocessing into materials for fuel or for backfilling operations. |
| Representative Concentration Pathways            | The basis on which Met Office climate change models are developed that take account of different levels of global carbon emissions.                                                                                                                                       |
| Re-use                                           | Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.                                                                                                                                       |
| Risk                                             | The likelihood of an adverse event occurring                                                                                                                                                                                                                              |
| River Basin Management Plan                      | A strategic plan produced by the Environment Agency that sets out how the water environment will be managed and protected to achieve Water Framework Directive objectives within a river basin district.                                                                  |
| Saline Limit                                     | The boundary between transitional (brackish) waters substantially influenced by freshwater flows and marine waters where saltwater conditions predominate.                                                                                                                |
| Supervisory Control and Data Acquisition (SCADA) | A system that collects data from sensors and equipment in industrial environments and allows operators to monitor and control processes remotely.                                                                                                                         |



| Term                                    | Definition                                                                                                                                                                                                          |
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| Seabed prehistory                       | Archaeological remains associated with prehistoric activity on what is now the seabed, when sea levels were lower.                                                                                                  |
| Secondary (foreseeable) mitigation      | Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the development consent, or through inclusion in an environmental assessment documentation. |
| Secondary A Aquifer                     | Permeable layers that can support local water supplies and may form an important source of base flow to rivers.                                                                                                     |
| Secondary B Aquifer                     | Mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks and openings or eroded layers.                                                    |
| Secondary materials/aggregates          | Useful by-products from manufacturing or industrial processes. Secondary aggregates are typically by-products of industrial and other processes.                                                                    |
| Secondary Undifferentiated Aquifer      | Where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.                                                     |
| Sessile                                 | Organisms that remain in one place as adults, immobile.                                                                                                                                                             |
| Severance                               | The division or fragmentation of agricultural land or holdings resulting in reduced accessibility or operational efficiency.                                                                                        |
| Standard Industrial Classification Code | A Standard Industrial Classification (SIC) code is a four-digit number used to identify and categorise a business's primary industry for statistical, regulatory, and reporting purposes.                           |
| Site of Special Scientific Interest     | Site designated as being of special interest for its flora, fauna or geological or physiographical features and protected under the Wildlife and Countryside Act 1981.                                              |
| Soil Carbon                             | Carbon stored within soil organic matter, including peat and peaty soils.                                                                                                                                           |
| Soil Function                           | The physical, chemical and biological processes carried out by soils, including food production, carbon storage, water regulation and support of habitats.                                                          |
| Soil Health                             | The continued capacity of soil to function as a living ecosystem that sustains plants, animals, humans and the wider environment.                                                                                   |



| Term                                 | Definition                                                                                                                                                                                                                                    |
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| Soil Resilience                      | The ability of a soil to resist or recover from damage caused by disturbance, handling or trafficking.                                                                                                                                        |
| Soil Resource Plan                   | A document used primarily in construction and land development projects to manage soil resources effectively. It provides clear guidance on how to recover, store, and reuse soils while minimising loss in quality and function.             |
| Soil Resource Survey                 | A site-specific survey undertaken to characterise soil types, profiles, condition and management requirements.                                                                                                                                |
| Soils Supporting Agriculture         | Soils whose primary function is the support of agricultural production and whose value is principally determined through the Agricultural Land Classification system.                                                                         |
| Soils Supporting Ecological Habitats | Soils that support habitats or ecological features of recognised importance.                                                                                                                                                                  |
| Sound Pressure                       | The difference between the pressure caused by a sound wave and the ambient pressure of the medium the sound wave is passing through.                                                                                                          |
| Sound Pressure Level (Lp)            | The logarithm of the ratio of a given sound pressure (p) to the reference sound pressure (p0). The reference value for sound pressure is 20 µPa.                                                                                              |
| Source Protection Zone               | A zone placed around a groundwater source, such as a well, borehole or spring, by the Environment Agency to protect a drinking water supply from pollution.                                                                                   |
| Source Protection Zone 1             | The inner zone from which it takes groundwater fifty days to travel to a groundwater abstraction point.                                                                                                                                       |
| Source Protection Zone 2             | The outer zone from which it takes 400 days for groundwater to travel to a groundwater abstraction point.                                                                                                                                     |
| Source Protection Zone 3             | The total catchment, which is the area around an abstraction point within which all the groundwater ends up at the abstraction.                                                                                                               |
| Special Area of Conservation         | An area within the UK which has been identified as being important for a range of vulnerable habitats, plant and animal species within the European Union and are designated under The Conservation of Habitats and Species Regulations 2017. |
| Special Protection Area              | Sites within the UK designated under The Conservation of Habitats and Species Regulations 2017 due to their international importance for the breeding, feeding, wintering, or the migration of rare and vulnerable species of birds.          |

| Term                                | Definition                                                                                                                                                                                                                                                                                                     |
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| Stable non-reactive hazardous waste | Hazardous waste, the leaching behaviour of which would not change adversely in the long-term.                                                                                                                                                                                                                  |
| Statutory Main River                | Rivers under the jurisdiction of the Environment Agency. These are generally larger arterial watercourses.                                                                                                                                                                                                     |
| Study Area                          | A study area relates to the area around the EIA Scoping Area.                                                                                                                                                                                                                                                  |
| Submerged palaeolandscapes          | Areas of former land now submerged beneath the sea or inland waters, which may preserve archaeological and palaeoenvironmental remains relating to past environments and human activity.                                                                                                                       |
| Sub-region                          | The defined geographical areas or physical extents of Suffolk County and Norfolk County.                                                                                                                                                                                                                       |
| Subtidal                            | The ocean region lying below low-tide, extending to the edge of the continental shelf.                                                                                                                                                                                                                         |
| Superficial geology                 | Uncemented sediments, such as alluvium, immediately beneath the soil and above the bedrock.                                                                                                                                                                                                                    |
| Supralittoral                       | The lower terrestrial zone, characteristically dominated by orange and white-to-grey lichens on hard substrata with scattered salt-tolerant higher plants and mosses.                                                                                                                                          |
| Temporary Land-take                 | Land occupied during construction that is subsequently reinstated to its former use.                                                                                                                                                                                                                           |
| TEMPro                              | A forecasting tool developed by the UK department for transport that provides growth factors for traffic and trip generation. It is specifically used to adjust base traffic flows for future-year scenarios in modelling and capacity analysis, ensuring consistency with national planning data.             |
| Tertiary (inexorable) mitigation    | Actions that would occur with or without input from an EIA feeding into the design process. This includes action that will be undertaken to meet other existing legislative requirements, or that are considered to be standard practices used to manage commonly occurring environmental impacts and effects. |
| Trackout                            | The transport of dust and dirt from the site onto the public road network, where it may be deposited and re-suspended by other vehicles using the road network                                                                                                                                                 |
| Tranquillity Mapping                | Mapping that identifies areas of relative peace and quiet, often used to assess perceptual qualities of landscapes.                                                                                                                                                                                            |

| Term                            | Definition                                                                                                                                                                                                                                                                                                                                                                                                 |
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| Trench collapse                 | The sudden failure of trench walls during excavation, potentially causing injury, burial of workers or damage to infrastructure.                                                                                                                                                                                                                                                                           |
| Trenchless crossing             | A crossing installation method that has limited above ground disturbance which is used to avoid a sensitive feature such as an environmental feature (e.g. road or river).                                                                                                                                                                                                                                 |
| Unexploded Ordnance (UXO)       | Military munitions that failed to detonate and remain hazardous.                                                                                                                                                                                                                                                                                                                                           |
| Waste                           | Defined in line with Article 3(1) of the Waste Framework Directive (Council Directive 2008/98/EC) as: <i>‘any substance or object which the holder discards or intends or is required to discard’</i> . Waste is commonly split into the following classifications: inert, hazardous and non-hazardous waste.                                                                                              |
| Waste hierarchy                 | The rank of waste management options according to what is best for the environment, as set out in Regulation 12 of The Waste (England and Wales) Regulations 2011. It gives top priority to preventing waste in the first place. When waste is created, it gives priority to preparing it for re-use, then recycling, then recovery (including energy recovery), and last of all disposal (e.g. landfill). |
| Waste infrastructure            | Facilities that handle, treat/prepare for reuse, recycle and dispose (landfill) of waste.                                                                                                                                                                                                                                                                                                                  |
| Waste prevention                | Measures taken before a substance, material or product has become waste, that reduce: (1) the quantity of waste, including through the re-use of products or the extension of the life span of products; (2) the adverse impacts of the generated waste on the environment and human health; or (3) the content of harmful substances in materials and products.                                           |
| Water body                      | Can refer to any surface water feature (Water Framework Directive water body, statutory main river, ordinary watercourse, ponds, lakes, estuaries etc.). Can also be applied to groundwater bodies.                                                                                                                                                                                                        |
| Water Framework Directive (WFD) | European Union legislation (retained in UK law) that establishes a framework for the protection of inland surface waters, transitional waters, coastal waters, and groundwater.                                                                                                                                                                                                                            |
| Water-Compatible Development    | Where temporary disruption from flooding is acceptable and the development remains safe.                                                                                                                                                                                                                                                                                                                   |

| Term                           | Definition                                                                                                                         |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Watercourse                    | Can refer to all types of rivers (Water Framework Directive water body, statutory main river, ordinary watercourse etc.).          |
| Wetness Class                  | A classification describing the frequency and duration of waterlogging within a soil profile.                                      |
| Zone of Influence              | Areas/resources that may be affected by changes caused by activities associated with the Proposed Development.                     |
| Zone of Theoretical Visibility | A map, usually digitally produced, showing areas of land within which a development is theoretically visible, based on topography. |

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- [5] The pumps do not operate at 24-hours per day.
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### Chapter 3: EIA Methodology

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## Chapter 5: Topics to be Scoped In

No references.

## Chapter 6: Terrestrial Biodiversity

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- [14] The EIA Scoping Area had not been set when the Survey Scope was produced. It was conducted on a 'cautious worst case' basis using the emerging EIA Scoping Area which allowed for various design permutations.
- [15] 'Habitat gain' is inherently not an adverse impact. However, habitat creation and landscaping can create potential impact pathways (both positive or negative) where they result in: (i) temporary disturbance to existing habitats and species during establishment works; (ii) changes to local hydrology or drainage management regimes arising from created habitats; (iii) introduction or spread of invasive non-native species ('INNS') during ground preparation or establishment; or (iv) changes in habitat composition that could alter existing species assemblages. Where habitat creation or enhancement gives rise to a credible impact pathway, the effect will be assessed in the Environmental Statement, and where effects are beneficial, these will be reported as such.
- [16] The presence of functionally linked land ('FLL') for birds within the study area is being identified through: desk-based study, bird surveys undertaken between 2025-2027, along with consultation with NE. There are no Special Areas of Conservation designated for bats within 10km, and so FLL for bats is not present within the study area. A full assessment of effects on FLL (if present) will be presented within the Habitats Regulations Assessment and Environmental Statement to be submitted in support of the DCO application.
- [17] Spread of aquatic invasive non-native species ('INNS') will be assessed within the freshwater biodiversity chapter of the Environmental Statement.
- [18] Impact Risk Zones for Sites of Special Scientific Interest ('SSSIs') assist with determining if a proposed development is likely to affect a terrestrial SSSI and when to consult Natural England. They make a rapid initial assessment of the potential risks posed by development proposals to SSSIs and those Special Areas of Conservation, Special Protection Areas or Ramsar sites that they underpin. They define zones around each site which reflect the sensitivities of the features for which the site is notified and indicate the types of development proposal which could potentially have adverse impacts and need further consideration (Natural England, 2026). Available at: <https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::sssi-impact-risk-zones-england/about>. (Accessed August 2026).
- [19] The use of a 5km radius around Special Protection Areas and Ramsar sites for the purpose of identifying functionally linked land
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for qualifying bird species has been established within the Wintering Bird Survey Scope 2025/2026 (Appendix 6.3). This was reviewed by Natural England in October 2025, who raised no objection to the use of the 5km radius.

- [20] An important ecological feature is defined in Guidelines for Ecological Impact Assessment in the UK and Ireland Version 1.3 (CIEEM, 2018) as an ecological feature requiring specific assessment within Ecological Impact Assessment ('EclA'). Ecological features can be important for a variety of reasons (e.g. quality and extent of designated sites or habitats, habitat/species rarity).
- [21] The importance of habitats will be established using all available data including: desk-based study data, AI tool data and the subsequent field verification (refer to paragraph 6.4.12).
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## Chapter 7: Freshwater Biodiversity

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- [2] Lentic ecosystems comprise standing freshwater systems (e.g. lakes, ponds and bogs).
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  - [7] Propagules – Any biological material capable of establishing a new individual or population, including seeds, spores, rhizomes, bulbs, tubers, stem or root fragments, and other viable plant or animal reproductive material that can be dispersed between locations.
  - [8] UK Government (2017), The Conservation of Habitats and Species Regulations 2017. Available at: <https://www.legislation.gov.uk/ukxi/2017/1012/contents> (Accessed August 2026).
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## Chapter 8: Marine Biodiversity

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### Chapter 13: Traffic and Access

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