The Great Grid Upgrade

Sea Link

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Part 2 Suffolk
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Water Environment

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4. Water Environment

4.1 Introduction

4.1.1 This chapter of the Environmental Statement (ES) presents the assessment of the likely significant water environment effects that could result from the Proposed Project (as described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**).

4.1.2 Water environment effects associated with the Suffolk Onshore Scheme are largely temporary, associated with the construction and, to a lesser extent, decommissioning of the Proposed Project. Potential effects are linked, for example, to changes to the existing land drainage regime due to soil stripping, earthworks and the introduction of impermeable land cover on undeveloped land and works in proximity to and crossing watercourses that could give rise to pollution or affect existing flow regimes.

4.1.3 The Order Limits, which illustrate the boundary of the Proposed Project, are shown on **Application Document 2.2.1 Overall Location Plan** and the Suffolk Onshore Scheme Boundary is illustrated on **Application Document 2.2.2 Suffolk Location Plan**.

4.1.4 This chapter should be read in conjunction with the following ES chapters:

- **Application Document 6.2.1.3 Part 1 Introduction Chapter 3 Main Alternatives Considered**;
- **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**;
- **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**;
- **Application Document 6.2.1.6 Part 1 Introduction Chapter 6 Scoping Opinion and EIA Consultation**;
- **Application Document 6.2.2.2 Part 2 Suffolk Chapter 2 Ecology and Biodiversity**; and
- **Application Document 6.2.2.5 Part 2 Suffolk Chapter 5 Geology and Hydrogeology**.

4.1.5 This chapter is supported by the following figures:

- **Application Document 6.4.2.4 Water Environment**; and
- **Application Document 2.11.1 Water Bodies in the River Basin Management Plan – Suffolk**.

4.1.6 This chapter is supported by the following appendices:

- **Application Document 6.3.2.4.A Appendix 2.4.A Water Environment Baseline Data**.

4.1.7 This chapter is also supported by the following application documents:

- **Application Document 7.5.3 Outline Onshore Construction Environmental Management Plan (CEMP)**;
- **Application Document 7.5.3.1 CEMP Appendix A Outline Code of Construction Practice**; and
- **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**.

4.1.8 The chapter should also be read in conjunction with **Application Document 6.8 Flood Risk Assessment** and **Application Document 6.9 Water Framework Directive Assessment**.

4.2 Regulatory and Planning Context

4.2.1 This section sets out the legislation and planning policy that is relevant to the water environment effects assessment. A full review of compliance with relevant national and local planning policy is provided within the **Application Document 7.1 Planning Statement** submitted as part of the application for Development Consent.

4.2.2 Policy generally seeks to minimise water environment effects from development and to avoid significant adverse effects. This applies particularly to the safeguarding of the physical and biological quality of waterbodies, the sustainable management of water resources and the prevention of impacts on land drainage regimes and flood risk.

Legislation

The Water Environment (Water Framework Directive [WFD] (England and Wales) Regulations 2017

4.2.3 The Water Environment (Water Framework Directive [WFD]) (England and Wales) Regulations 2017 (as amended) (HM Government, 2017) implemented the WFD in England and Wales. Under Section 2 of the European Union (Withdrawal) Act 2018, the 2017 Regulations continue to have effect in domestic law following the UK's withdrawal from the European Union.

4.2.4 The purpose of the WFD is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and ground waters to prevent further deterioration in, and enhance, water quality, and to promote sustainable water use. The 2017 Regulations require the "appropriate agency" (the Environment Agency, for England) to prepare River Basin Management Plans (RBMPs) for each river basin district (RBD), for the approval of the Secretary of State.

4.2.5 The RBMPs describe the current state of the water environment for each RBD, the pressures affecting the water environment, the objectives for protecting and improving it, and the programme of measures needed to achieve the statutory environmental objectives of the WFD (i.e., to enable water bodies to achieve Good status).

4.2.6 Under the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (HM Government, 2009), an application for a Development Consent Order (DCO) must be accompanied by a plan with accompanying information identifying water bodies in RBMP, together with an assessment of any effects on such water bodies likely to be caused by the development (Regulation 5). This is commonly referred to as a WFD assessment.Part 5 of the Environment Act 2021.

4.2.7 Part 5 of the Environment Act 2021 (HM Government, 2021), brings together measures to strengthen and update the existing regulatory and long-term planning framework for water, helping to reduce environmental risks, including to water quality and land drainage. It also strengthens the regulation of water and sewerage undertakers through the newly established Office for Environmental Protection.

The Land Drainage Act 1991

4.2.8 The Land Drainage Act 1991 (HM Government, 1991) and the Environmental Permitting (England and Wales) Regulations (HM Government, 2016) impose certain controls in relation to the placing of structures and the carrying out of works affecting main rivers and other (ordinary) watercourses.

National Policy

National Policy Statements

4.2.9 National Policy Statements (NPS) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Proposed Project would be considered. Table 4.1 and Table 4.2 below provide details of the elements of the NPS for Energy (EN-1) (Department for Energy Security & Net Zero , 2023) and NPS for Electricity Networks Infrastructure (EN-5) (Department for Energy Security & Net Zero, 2023) that are relevant to this chapter. NPS EN-3 Renewable Energy Infrastructure has relevance to the Proposed Project, but only in respect of the offshore elements. As such it has no relevance to the assessment presented in this chapter.

Table 4.1 NPS EN-1 requirements relevant to water environment

NPS EN-1 section	Where this is covered in the ES
Part 5.8.7 "*Where new energy infrastructure is, exceptionally, necessary in flood risk areas (for example where there are no reasonably available sites in areas at lower risk), policy aims to make it safe for its lifetime without increasing flood risk elsewhere and, where possible, by reducing flood risk overall. It should also be designed and constructed to remain operational in times of flood."*	The Suffolk Onshore Scheme has largely avoided flood risk areas and where this is not wholly practicable, **Application Document 6.8 Flood Risk Assessment** identifies the flood risk resilience measures that have been embedded into the Proposed Project design in order to meet the policy requirements.
Part 5.8.13 "*A site-specific flood risk assessment should be provided for all energy projects in Flood Zones 2 and 3 in England or Zones B and C in Wales. In Flood Zone 1 in England or Zone A in Wales, an assessment should accompany all proposals involving:* • *sites of 1 hectare or more* • *land which has been identified by the EA or NRW as having critical drainage problems*	A site-specific Flood Risk Assessment (FRA) has been undertaken. The findings are reported in **Application Document 6.8 Flood Risk Assessment** and have been used to inform the assessment of effects reported in Sections 4.9 and 5.11.

NPS EN-1 section	Where this is covered in the ES
• *land identified (for example in a local authority strategic flood risk assessment) as being at increased flood risk in future* • *land that may be subject to other sources of flooding (for example surface water)* • *where the EA or NRW, Lead Local Flood Authority, Internal Drainage Board or other body have indicated that there may be drainage problems."*	
Part 5.8.14 "*This assessment should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account."*	The FRA that has been prepared (**Application Document 6.8 Flood Risk Assessment**) assesses flood risk from all applicable sources and sets out the measures proposed to manage flood risk, considering climate change over the Proposed Project's lifetime.
Part 5.8.18 *"Applicants for projects which may be affected by, or may add to, flood risk should arrange pre-application discussions before the official pre-application stage of the NSIP process with the EA or NRW, and, where relevant, other bodies such as Lead Local Flood Authorities, Internal Drainage Boards, sewerage undertakers, navigation authorities, highways authorities and reservoir owners and operators."*	Regular engagement with the Environment Agency, Lead Local Flood Authorities (LLFA) and Internal Drainage Boards (IDB) has taken place to agree assessment methodologies and key design principles and water environment mitigation measures. Further details of this engagement are provided in Section 4.2.
Part 5.8.19 *"Such discussions should identify the likelihood and possible extent and nature of the flood risk, help scope the FRA and identify the information that will be required by the Secretary of State to reach a decision on the application when it is submitted. The Secretary of State should advise applicants to undertake these steps where they appear necessary but have not yet been addressed."*	Regular engagement with the Environment Agency, Lead Local Flood Authorities (LLFA) and Internal Drainage Boards (IDB) has taken place to agree assessment methodologies and key design principles and water environment mitigation measures. Further details of this engagement are provided in Section 4.2.
Part 5.16.1 *"Infrastructure development can have adverse effects on the water environment, including groundwater, inland surface water, transitional waters, coastal and marine waters."*	The effects of the Proposed Project on inland surface waters are assessed herein. Groundwater effects are assessed in **Application Document 6.2.2.5 Part 2 Suffolk Chapter 5 Geology and Hydrogeology** and effects on transitional and coastal/marine waters associated with the Offshore Scheme are assessed in **Application Document 6.2.4.1 Part 4 Marine Chapter 1 Physical Processes**.
Part 5.16.2 *"During the construction, operation and decommissioning phases, development can lead to increased demand for water, involve*	These aspects have been subject to EIA Scoping (**Application Document 6.2.1.6 Part 1 Introduction Chapter 6 Scoping**

NPS EN-1 section	Where this is covered in the ES
discharges to water and cause adverse ecological effects resulting from physical modifications to the water environment. There may also be an increased risk of spills and leaks of pollutants to the water environment. These effects could lead to adverse impacts on health or on protected species and habitats (see Section 4.3) and could result in surface waters, groundwaters or protected areas failing to meet environmental objectives established under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and the Marine Strategy Regulations 2010. ''	**Opinion and EIA Consultation**) and in accordance with the Scoping Opinion, matters with potential to give rise to a likely significant effect were scoped in and are assessed herein. The potential for the Proposed Project to compromise objectives established under the Water Environment Directive (WFD) has been assessed in **Application Document 6.9 Water Framework Directive Assessment**.
Part 5.16.3 *"'Where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment and how this might change due to the impact of climate change on rainfall patterns and consequently water availability across the water environment, as part of the ES or equivalent (see Section 4.3 and 4.10)."*	These aspects of the water environment within the study area are described in Section 4.6 which also includes consideration of how baseline conditions may change in the future.
Part 5.16.4 *"The Secretary of State should be satisfied that a proposal has regard to current River Basin Management Plans and meets the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (including regulation 19). The specific objectives for particular river basins are set out in River Basin Management Plans. The Secretary of State must refuse development consent where a project is likely to cause deterioration of a water body or its failure to achieve good status or good potential, unless the requirements set out in Regulation 19 are met. A project may be approved in the absence of a qualifying Overriding Public Interest test only if there is sufficient certainty that it will not cause deterioration or compromise the achievement of good status or good potential."*	The potential for the Proposed Project to compromise objectives established under the WFD has been assessed in **Application Document 6.9 Water Framework Directive Assessment**. This assessment has been prepared with reference to the specific objectives set for relevant waterbodies within the Anglian River Basin Management Plan (Environment Agency, 2022).
Part 5.16.15 *"The Secretary of State should also consider the interactions of the proposed project with other plans such as Water Resources Management Plans and Shoreline Management Plans."*	**Application Document 6.9 Water Framework Directive Assessment** has been prepared with reference to Essex and Suffolk Water Resource Management Plan (Essex & Suffolk Water, 2019) and the Lowestoft Ness to Felixstowe Landguard Point Shoreline

NPS EN-1 section	Where this is covered in the ES
	Management Plan (Suffolk Coastal District Council, 2012).
Part 5.15.7 *"The Secretary of State should consider proposals to mitigate adverse effects on the water environment and any enhancement measures put forward by the applicant and whether appropriate requirements should be attached to any development consent and/or planning obligations are necessary."*	Measures to mitigate likely significant adverse effects on the water environment are described in Sections 4.8 and 4.10.

Table 4.2 NPS EN-5 requirements relevant to water environment

NPS EN-5 section	Where this is covered in the ES
Part 2.3.2 *"As climate change is likely to increase risks to the resilience of some of this infrastructure, from flooding for example, or in situations where it is located near the coast or an estuary or is underground, applicants should in particular set out to what extent the proposed development is expected to be vulnerable, and, as appropriate, how it has been designed to be resilient to:* *• flooding, particularly for substations that are vital to the network; and especially in light of changes to groundwater levels resulting from climate change;* *• the effects of wind and storms on overhead lines;* *• higher average temperatures leading to increased transmission losses;* *• earth movement or subsidence caused by flooding or drought (for underground cables); and* *• coastal erosion – for the landfall of offshore transmission cables and their associated substations in the inshore and coastal locations respectively."*	The FRA that has been prepared (**Application Document 6.8 Flood Risk Assessment**) examines future flood risk to the Proposed Project over its lifetime, and identifies mitigation measures required to ensure flood resilience, taking climate change predictions into account. The Proposed Project's resilience to other aspects of climate change is addressed in **Application Document 6.2.5.1 Part 5 Combined Climate Change**.
Part 2.3.3 *"Section 4.10 of EN-1 advises that the resilience of the project to the effects of climate change must be assessed in the Environmental Statement (ES) accompanying an application. For example, future increased risk of flooding would be covered in any flood risk assessment (see Sections 5.8 in EN-1). Consideration should also be given to coastal change (see sections 5.6 in EN1)."*	The FRA that has been prepared for the Proposed Project (**Application Document 6.8 Flood Risk Assessment**) examines future flood risk to the Proposed Project over its lifetime, and identifies mitigation measures required to ensure flood resilience, taking climate change predictions into account.
Part 2.9.19 "*In brief, the Horlock Rules state that applicants should: […] protect as far as reasonably practicable areas of local amenity value, important*	The potential for the Project to compromise waterbody qualities established under the WFD has been

NPS EN-5 section	Where this is covered in the ES
existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas."	assessed in **Application Document 6.9 Water Framework Directive Assessment**.

National Planning Policy Framework

4.2.10 The National Planning Policy Framework (NPPF) as revised in December 2024 (Ministry of Housing, Communities and Local Government, 2024) sets out national planning policies that reflect priorities of the Government for operation of the planning system and the economic, social, and environmental aspects of the development and use of land. The NPPF has a strong emphasis on sustainable development, with a presumption in favour of such development. The NPPF has the potential to be considered important and relevant to the Secretary of States (SoS) consideration of the Proposed Project.

4.2.11 Table 4.3 below provides details of the elements of the NPPF that are relevant to this chapter, and how and where they are covered in the ES.

Table 4.3 NPPF requirements relevant to water environment

NPPF section	Where this is covered in the ES
Paragraphs 162 and 164 These paragraphs advocate adoption of proactive strategies to mitigate and adapt to climate change, taking account of the full range of potential climate change impacts, including flood risk, coastal change, water supply, biodiversity and landscapes.	The Proposed Project has been subject to a detailed FRA (**Application Document 6.8 Flood Risk Assessment**) the findings of which have been used to develop the design to ensure the Proposed Project would be safe over its lifetime, without increasing flood risk elsewhere. The Proposed Project avoids situating proposed new substations and converter stations in areas that are at risk of flooding now and into the future.
Paragraphs 170, 172 and 174 These paragraphs introduce and set out the aims of the Sequential Test, to steer new development to areas with the lowest risk of flooding and which is applied based on the relevant strategic flood risk assessment. NPPF advocates that the sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.	An FRA has been prepared (**Application Document 6.8 Flood Risk Assessment**) to demonstrate compliance with the stated criteria. The Sequential Test has been applied and development has been directed away from areas of high flood risk where possible.
Paragraphs 177 to 181 These paragraphs introduce and set out the aims and requirements of the Exception Test, stating that: *"to pass the exception test it should be demonstrated that:(a) the development would*	Where it has not been possible to wholly avoid development in areas with a higher risk of flooding, the Exception Test has been applied. The FRA (**Application Document 6.8 Flood**

NPPF section	Where this is covered in the ES
provide wider sustainability benefits to the community that outweigh the flood risk; and(b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall."	**Risk Assessment**) demonstrates compliance with the requirements of this test.
Paragraph 182 "*Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff."*	The Proposed Project is committed to incorporating Sustainable Drainage Systems (SuDS) to manage construction and operational drainage. Details of the key drainage principles are provided within the FRA (**Application Document 6.8 Flood Risk Assessment**).
Paragraph 187 *"Planning policies and decisions should contribute to and enhance the natural and local environment by [inter alia]…) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans".*	Measures to mitigate against adverse impacts on water quality are described in Section 4.8 and 4.10 and the Water Framework Directive Assessment that has been prepared (**Application Document 6.9 Water Framework Directive Assessment**) sets out how the Proposed Project would contribute to the objectives set out for relevant waterbodies within the Anglian River Basin Management Plan (Environment Agency, 2022).

National Planning Practice Guidance

4.2.12 There are two National Planning Practice Guidance publications that are relevant to the water environment, the requirements of which are covered herein. The flood risk and coastal change guidance (Ministry of Housing, Community and Local Government, 2022) advises how to take account of and address the risks associated with flooding and coastal change in the planning process. The water supply, wastewater and water quality guidance (Ministry of Housing, Community and Local Government, 2019) advises on how planning can ensure water quality and the delivery of adequate water and wastewater infrastructure.

Local Planning Policy

4.2.13 The Suffolk Onshore Scheme (refer to **Application Document 2.2.2 Suffolk Location Plan**) lies within the jurisdiction of Suffolk County Council. County planning guidance which is relevant to a study of the water environment and has informed the assessment of preliminary effects in this chapter are as follows:

- Planning a development in a flood zone (Suffolk County Council, 2024).

4.2.14 This policy statement sets out the Council's expectations and advice for developing in a flood zone.

Local Plans

4.2.15 The Suffolk Onshore Scheme (refer to **Application Document 2.2.2 Suffolk Location Plan**) lies within the jurisdiction of East Suffolk Council. Local planning policy for East Suffolk Council consists of two parts; the Suffolk Coastal Local Plan (East Suffolk Council, 2020) and the Waveney Local Plan (East Suffolk Council, 2019).

4.2.16 The Suffolk Onshore Scheme lies within the boundary of the Suffolk Coastal Local Plan (adopted September 2020) (East Suffolk Council, 2020). Local Plan policies which are relevant to water environment assessment matters and have informed the water environment assessment are detailed in Table 4.4.

Table 4.4 Local planning policies relevant to water environment – Suffolk Coastal Local Plan

Suffolk Coastal Local Plan - Policy	Where this is covered in the ES
SCLP9.5 - Flood Risk *The Strategic Flood Risk Assessment should be the starting point in assessing whether a proposal is at risk from flooding. Proposals for new development, or the intensification of existing development, will not be permitted in areas at high risk from flooding, i.e. Flood Zones 2 and 3, unless the applicant has satisfied the safety requirements in the Flood Risk National Planning Policy Guidance (and any successor). These include the 'sequential test';* *where needed the 'exception test' and also a site specific flood risk assessment that addresses the characteristics of flooding and has tested an appropriate range of flood event scenarios (taking climate change into consideration). Developments should exhibit the three main principles of flood risk, in that, they should be safe, resilient and should not increase flood risk elsewhere.*	An FRA has been prepared (**Application Document 6.8 Flood Risk Assessment**) in accordance with the requirements of the relevant NPS, NPPF and associated guidance, inclusive of the Suffolk Coastal and Waveney District Councils Level 1 SFRA (Scott Wilson, 2008). The FRA identifies the necessary mitigation, which has been secured within the DCO, to ensure that there is not an unacceptable risk of flooding to the Proposed Project or elsewhere.
SCLP9.6 - Sustainable Drainage Systems *Developments should use sustainable drainage systems to drain surface water unless demonstrated to be inappropriate. Sustainable drainage systems should:* *a) Be integrated into the landscaping scheme and green infrastructure provision of the development;* *b) Contribute to the design quality of the scheme; and* *c) Deliver sufficient and appropriate water quality and aquatic biodiversity improvements, wherever possible. This should be complementary of any local designations such as Source Protection Zones.*	Measures for mitigation of surface water flooding are covered in Section 4.8 and 4.10, with further information provided within the FRA (**Application Document 6.8 Flood Risk Assessment**) and a secured commitment for provision of a detailed Drainage Management Plan to be prepared by the appointed contractor.

Suffolk Coastal Local Plan - Policy	Where this is covered in the ES
Runoff rates from new development must be restricted to greenfield runoff rates wherever possible.	
SCLP10.3 - Environmental Quality *Development proposals will be expected to protect the quality of the environment and to minimise and, where possible, reduce all forms of pollution and contamination. Development proposals will be considered in relation to impacts on water quality and the achievement of Water Framework Directive objectives. The cumulative effect of development, in this regard, should be considered.*	Measures for mitigation of pollution of the water environment are covered in Section 4.8 and 4.10. Further information assessing the effects on water quality and Water Framework Directive objectives are covered within the WFD assessment (**Application Document 6.9 Water Framework Directive Assessment**). An assessment of the cumulative effects of the Suffolk Onshore Scheme on water environment receptors is presented in **Application Document 6.2.2.13 Part 2 Suffolk Chapter 13 Suffolk Onshore Scheme Intra-Project Cumulative Effects**.

4.3 Scoping Opinion and Consultation

Scoping

4.3.1 A Scoping Report for the Proposed Project was issued to the Planning Inspectorate (PINS) on 24 October 2022 (**Application Document 6.14 Environmental Scoping Report 2022**) and a Scoping Opinion was received from the SoS on 1 December 2022 (**Application Document 6.15 Scoping Opinion**). Table 4.5 sets out the comments raised in the Scoping Opinion in relation to the water environment and how these have been addressed in this ES. The Scoping Opinion takes account of responses from prescribed consultees as appropriate. **Application Document 6.3.1.6.A Appendix 1.6.A Response to Scoping Opinion** provides responses to the comments made by the prescribed consultees at scoping stage and how each comment has been considered.

Table 4.5 Comments raised in the Scoping Opinion

ID	Inspectorate's comments	Response
3.4.2	*[Pollution of watercourses associated with operational discharges and runoff from above ground infrastructure (AGI) – water quality effects (operation)]* This matter is proposed to be scoped out on the basis of no impact pathway given treatment through Sustainable Drainage System (SuDS) provision. The Inspectorate agrees that,	The measures embedded within the design of the Proposed Project to mitigate the risks of pollution of the watercourses that would receive drainage discharges from operational AGI are summarised in Section 4.8, **Application Document 6.2.1.4**

ID	Inspectorate's comments	Response
	provided the measures to mitigate the risks of pollution of watercourses are clearly described in the ES and secured in the draft DCO (dDCO), this matter can be scoped out of further assessment.	**Description of the Proposed Project** and are secured in the DCO via commitments within **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**.
3.4.3	*[Increased flood risk from operational discharges and runoff from AGI and loss of floodplain storage (operation)].* This matter is proposed to be scoped out on the basis of no impact pathway given attenuation of runoff through SuDS provision. The Inspectorate agrees that, provided the operational control measures in the form of SuDS are clearly described in the ES and secured through the dDCO, this would ensure no pathway of effect to result in increased flood risk from operational discharges and runoff from AGI or loss of floodplain storage.	Operational control measures in the form of SuDS are described in **Application Document 6.2.1.4 Description of the Proposed Project** and secured through the DCO via the REAC (**Application Document 7.5.3.2**).
3.4.4	*[Physical disturbance, impact to flow regimes (watercourse crossings) from operational infrastructure (AGI and watercourse crossings)]* This matter is proposed to be scoped out on the basis that there would be no impact pathway, as there would be no physical disturbance during operation. The Inspectorate agrees that following construction further physical disturbance or impact on flow regimes at watercourse crossings is unlikely and therefore this matter can be scoped out of the assessment.	In line with the conclusions of the scoping opinion, operational effects on hydromorphology are scoped out and have not been subject to further assessment herein.
3.4.5	*[Increased surface water runoff from converter station drainage during operation on receptors 'existing land uses and infrastructure' (operation)]* This matter is proposed to be scoped out on the basis of no impact pathway, given the attenuation of runoff through the SuDS provision. Table 2.5.9 indicates this applies to the operation and maintenance stages. The Inspectorate agrees that SuDS provision would remove/reduce the likelihood of surface water runoff from the convertor site during operation and thus ensure any such effects would be fully mitigated. The Inspectorate therefore agrees this matter can be scoped out of the assessment.	In line with the conclusions of the scoping opinion, operational effects on existing land uses and infrastructure from increased surface water runoff from the converter station drainage during operation were scoped out and have not been subject to further assessment herein.

ID	Inspectorate's comments	Response
3.4.6	*[Increased flood risk due to permanent loss of floodplain storage/impediment of floodplain flows at the converter station site]* This matter is proposed to be scoped out on the basis that there would be no impact pathway, as there would be no permanent works in the floodplain. The Inspectorate considers it would have been helpful to overlay the converter site options with the flood mapping. The ES should include a clear plan showing the chosen converter site location (or options, where being pursued) and flood risk zones. At this stage of design and from the information provided, the Inspectorate understands that none of the converter site options are located within the floodplain and thus agrees that consideration of permanent loss of fluvial and coastal floodplain as a result of the converter site can be scoped out of the assessment. However, should this not be the case, the ES should include an assessment of any such likely significant effects.	No operational above ground infrastructure, including the proposed converter station and bridge over the River Fromus, would be located in the floodplain, as illustrated in **Application Document 6.4.2.4.2 Flood Risk Baseline**. The FRA that has been prepared (**Application Document 6.8 Flood Risk Assessment**) demonstrates that the Proposed Project would not cause increases in fluvial flood risk due to permanent loss of floodplain storage/impediment of floodplain flows at the converter station site.
3.4.7	*[Permanent physical disturbance and change to flow regime of unnamed ordinary watercourses, main rivers at the converter station option sites]* This matter is proposed to be scoped out on the basis that there would be no impact pathway as cables would be buried. Although not explicitly stated in Table 2.5.2, the Inspectorate assumes this is for the operational and maintenance stage only as per Tables 2.5.1 and 2.5.9. Although it is also noted that Table 2.5.1 scopes in "…physical disturbance" at the maintenance stage. The Scoping Report does not clearly identify the location of these watercourse receptors and their proximity to converter site options. To aid the reader the ES should clearly identify these receptors on an accompanying figure. The Inspectorate agrees that following construction further physical disturbance or impact on flow regimes at watercourses during operation is unlikely and therefore permanent physical disturbance and change to flow regime effects during operation can be scoped out of the assessment. On the basis that the ES describes the maintenance activities and demonstrates how permanent physical	Watercourse receptors are illustrated in **Application Document 6.4.2.4.1 Study Area and Water Environment Receptors** and those that are crossed by any temporary or permanent part of the Suffolk Onshore Scheme are listed in **Application Document 6.3.1.4.A Appendix 1.4.A Crossings Schedule**. Maintenance activities are described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**. On the basis of the nature of the activities and that these activities would be subject to robust control measures to safeguard environmental receptors, described in **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**, permanent physical disturbance and change to flow regimes of

ID	Inspectorate's comments	Response
	disturbance and change to flow regime on these receptors for the identified converter site options will be avoided so that significant effects are not likely to occur, the Inspectorate agrees to scope this matter out.	watercourses at the converter station site during operation and maintenance has been scoped out.
3.4.8	*[Pollution of watercourses and physical disturbance during maintenance]* This matter is proposed to be scoped out on the basis of no impact pathway for a significant effect given the likely nature and scale of maintenance activities. As noted at point 3.4.1 of the Opinion above, Table 2.5.1 scopes in 'pollution of watercourses and physical disturbance' from maintenance activities; however, this matter is scoped out in Table 2.5.2. Summary Table 2.5.9 does not reference pollution effects during maintenance at all. The ES should make clear whether maintenance activities have been scoped in/out of the assessment.	Maintenance activities, which are described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project** have been scoped out of the assessment. This is on the basis of the nature of the activities and that these activities would be subject to robust control measures described in **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)** to safeguard environmental receptors.
3.4.9	*[Temporary loss of floodplain storage/impediment of floodplain flows due to spoil storage during construction and decommissioning].* This matter is proposed to be scoped out on the basis that areas of floodplain are very localised and could be avoided. Provided the ES, supported by the FRA, demonstrates how the loss of floodplain/impediment of floodplain flows will be avoided during construction and decommissioning and mitigation measures are secured through the dDCO, the Inspectorate agrees to scope this matter out.	Limited and localised temporary works would take place in areas of floodplain. The effects of these activities are assessed in Section 4.9 below, informed by the findings of the FRA (**Application document 6.8 Flood Risk Assessment**) which concludes no likely significant effects.
3.4.10	*[Reduced water availability to support abstractions and assimilate discharges for all stages and options].* This matter is referenced in the Summary Table 2.5.9, but no information is provided to explain why this matter is to be scoped out of the assessment, such as a description of the 'existing water interests' receptors, the need for the Proposed Development to abstract water and the likelihood (or otherwise) of reduced water availability as a result of the Proposed Development. In the absence of supporting information the Inspectorate cannot agree to	Further justification for scoping out this matter is provided in the **Aspects scoped out of the assessment section** below. Reasons why likely significant effects on existing local water resources (quantity and quality) are not anticipated are described in paragraph 4.3.15. Those existing water interests that rely on these resources would not

ID	Inspectorate's comments	Response
	scope out this matter at this stage. The ES should provide further justification to support scoping out of this matter or an assessment, where likely significant effects could occur.	consequently be significantly affected.
3.4.11	*[Study Area]* The Scoping Report identifies a 500m buffer around the Suffolk Onshore Scheme Scoping Boundary but does not give reasons for the choice of study area. The ES should clearly define the study area, based on the ZOI from the Proposed Development, together with a justification for the selection.	The proposed study area is illustrated in **Application Document 6.4.2.4.1 Study Area and Water Environment Receptors** and described in Section 4.6, which provides justification for the selection.
3.4.12	*[Embedded measures/design –watercourse crossings]* The Scoping Report does not currently identify the types of crossings to be applied, but states that 'suitable crossing designs would be selected with the aim of reducing impacts'. The Applicant's attention is directed to the comments of the EA at Appendix 2 to this Opinion with regards to the culverting of watercourses, which the EA would oppose.	The Proposed Project has engaged with key stakeholders to agree suitable watercourse crossing design principles and the proposed approaches to watercourse crossings are outlined in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**. A suite of measures to reduce the temporary impacts of watercourse crossings are described in **Application Document 7.5.3 Outline Onshore Construction Environmental Management Plan (CEMP)**.
3.4.13	*[Receptors]* Examples in this table do not reference property, businesses or people. The ES should provide justification for the receptors identified for the assessment.	The potential for people, existing properties and businesses as receptors with regard to effects on flood risk and land drainage have been included within the assessment provided in Section 4.9 below.
3.4.13	*[Assessment methodology – magnitude criteria]* Examples within this table include reference to fishery value or designated nature conservation sites, although such receptor types are not explicitly mentioned in this aspect chapter. The Water Environment aspect chapter of the ES should include appropriate cross-references to other relevant aspect chapters such as Ecology and Biodiversity.	Suitable cross references to other relevant chapters of the ES are provided herein.

Statutory Consultation

4.3.2 Statutory Consultation for the Proposed Project took place between 24 October and 18 December 2023. A further Targeted Consultation exercise on the main changes to the Proposed Project introduced after the 2023 statutory consultation, was undertaken between 8 July and 11 August 2024. In addition, a project update and a local engagement exercise took place between 22 November 2024 and 12 January 2025, focusing on design amendments made following Targeted Consultation. A summary of relevant feedback received during consultation relating to water environment is provided in subsequent paragraphs below. Further details on how consultation responses have informed the assessment can be found in **Application Document 5.1 Consultation Report** and **Application Document 5.1.9 Appendix H Summary 2023 Response**.

4.3.3 Feedback was received from several stakeholders, with most comments linking to flood risk, drainage and watercourse crossings, with some feedback on the scope of the Water Framework Directive Assessment (**Application Document 6.9 Water Framework Directive Assessment**) also received from the Environment Agency.

4.3.4 The robust management of drainage routes and runoff during construction of the Proposed Project was highlighted by stakeholders. The Environment Agency requested that the effects of crossings of main rivers be assessed and that all floodplain storage losses are compensated for.

4.3.5 The FRA that has been prepared for the Proposed Project (**Application Document 6.8 Flood Risk Assessment**) examines future flood risk to the Proposed Project over its lifetime, and identifies mitigation measures required to ensure flood resilience, taking climate change predictions into account. The measures proposed to manage land drainage and surface water runoff during construction are described in **Application Document 7.5.3 Outline Onshore Construction Environmental Management Plan (CEMP)** and its appendix the CoCP (**Application Document 7.5.3.1**).

Further Engagement

4.3.6 A series of water environment thematic meetings have been held with Suffolk stakeholders, including the Environment Agency (EA), Suffolk County Council and East Suffolk Council. During the thematic meetings a range of matters have been discussed, including updates on design matters such as refinements to the surface water drainage proposals, the Proposed Project's intended strategy to consenting works under the Environmental Permitting Regulations and the design and assessment of the effects of the proposed permanent crossing of the River Fromus, with respect to effects on flood risk, WFD status and ecology (addressed in **Application Document 6.2.2.2 Part 2 Suffolk Chapter 2 Ecology and Biodiversity**).

4.3.7 The Proposed Project's drainage arrangements have considered the interaction with other planned development in the vicinity to ensure holistic solutions are put in place as requested by Suffolk County Council during thematic meetings. Suffolk County Council were also able to provide details of Surface Water Modelling at Friston, which has been used to inform the flood risk within the FRA (**Application Document 6.8 Flood Risk Assessment**).

4.3.8 Through this further engagement, the approach for secondary consents and permit applications e.g. not to disapply Flood Risk Activity Permits (FRAPs) within the DCO, instead applying for FRAPs pre-construction) was discussed and agreed. The approach for the Fromus watercourse crossing design was also shared and discussed during this engagement.

4.3.9 Drafts of the WFD (**Application Document 6.9 Water Framework Directive Assessment**) and FRA (**Application Document 6.8 Flood Risk Assessment**) have been shared with the EA prior to DCO submission and their feedback considered in the finalisation of these documents. The hydraulic modelling used to inform the assessment of the River Fromus crossing will also be reviewed by the EA prior to DCO submission to ensure its standard.

Summary of Scope of Assessment

4.3.10 This section details what aspects have been scoped in and scoped out of the assessment through the scoping process and consultation with stakeholders.

Aspects scoped into the assessment

4.3.11 Potential for temporary effects on the water quality, flow regimes and hydromorphology of watercourses within the study area have been assessed during the construction stage.

4.3.12 Short term effects on the existing land drainage regime and flood risk during construction have also been scoped into the assessment.

Aspects scoped out of the assessment

4.3.13 Several aspects have been scoped out of the assessment, in accordance with the Scoping Opinion. These matters relate to the operation of the Proposed Project, specifically the potential for water pollution, increases in flood risk (due to permanent loss of floodplain storage and impediment of floodplain flows) and surface water runoff, as well as permanent physical disturbance and change in the flow regimes of ordinary watercourses and main rivers at the converter station site and at watercourse crossings.

4.3.14 These have been scoped out given the embedded design and control measures that have been secured that would avoid effects, e.g. siting of operational AGI out of any floodplains and areas at high risk of surface water flooding or weaken impact source pathways such that significant effects are not likely. An example is the provision of SuDS to attenuate and treat operational drainage discharges as so avoiding effects on the water quality and flow regimes of receiving watercourses.

4.3.15 Reduced water availability to support abstractions and assimilate discharges has also been scoped out for all stages. This is on the basis that the integrity of existing water interests would be protected during construction of the Proposed Project by the suite of measures detailed in **Application Document 7.5.3 Outline Onshore Construction Environmental Management Plan (CEMP)** to prevent pollution of the water environment, and by the commitments to use water efficiently, as described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**. No new consumptive water abstraction is required to supply the Proposed Project water needs during construction or operation. Therefore, existing local water resource (quantity and quality) would not be significantly impacted and those existing water interests that rely on these resources would not be consequently significantly affected.

4.3.16 Effects associated with the future maintenance of the Proposed Project have also been scoped out of the assessment.

4.4 Approach and Methodology

4.4.1 **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** sets out the overarching approach which has been used in developing the ES. This section describes the technical methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of effects and sets out the significance criteria that have been used for the water environment assessment.

Guidance Specific to the Water Environment Assessment

4.4.2 The water environment assessment has been carried out in accordance with the following good practice guidance documents:

- Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive;
- National Highways Design Manual for Roads and Bridges LA113;
- Construction Industry Research and Information Association (CIRIA) publications (various dates);
- Guidance for Pollution Prevention series; and
- The Suffolk SuDS Guide.

Baseline Data Gathering and Forecasting Methods

4.4.3 Baseline conditions of the Proposed Project were established during a desk study using the following sources:

- Statutory Main River map for England (Environment Agency, 2024);
- Environment Agency Flood Map for Planning (Environment Agency, 2023);
- Environment Agency long-term flood risk mapping (including flood risk from surface water and reservoirs) (Environment Agency, 2024);
- The Anglian River Basin Management Plan (Environment Agency, 2022);
- The EA Catchment Data Explorer (Environment Agency, 2024);
- East Suffolk WMB online mapping (East Suffolk IDB, 2024);
- Details of consented discharges to surface waters and licensed abstractions from surface waters (Groundsure, 2022);
- Flood model of the River Fromus and modelling outputs (Mott MacDonald, 2020);
- EA water quality data archive (Environment Agency, 2024);
- Photographs and field notes from ecology phase 1 and aquatic surveys (**Application Document 6.3.2.2.A Appendix 2.2.A Extended Phase 1 Habitat Survey Report** and **Application Document 6.3.2.2.F Appendix 2.2.F Aquatic Ecology Survey Report**); and
- Strategic Flood Risk Assessment prepared on behalf of Suffolk Coastal and Waveney District Councils (Scott Wilson, 2008).

Assessment Criteria

4.4.4 The adopted assessment methodology is drawn from DMRB LA113 (Highways England, 2020). Whilst primarily intended for use in assessing the impacts of highways projects on the water environment, the methodology is widely accepted as suitable for assessing the effects of other types of linear infrastructure projects on water environment receptors. The method promotes assessment that is proportionate to the scale and nature of the proposals and that considers the sensitivity of the local water environment to change.

4.4.5 With reference to **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** the adopted assessment criteria are very similar to that proposed in the overarching methodology, with the exception of an additional receptor sensitivity category of negligible in the generic criteria. The terminology language for defining sensitivity is otherwise the same.

Sensitivity of water environment receptors

4.4.6 Classification of receptor sensitivity has been guided by Table 3.70 of the DMRB LA113 (Highways England, 2020). The criteria are reproduced in Table 4.6.

Table 4.6 Classification of water environment receptor sensitivity

Value of Receptor	Criteria	Typical Examples
Very high	Nationally significant attribute of high importance	Site protected/designated under European Commission (EC) or UK legislation (Special Area of Conservation, Special Protection Area, Site of Special Scientific Interest, Ramsar site). Watercourse having a Water Framework Directive (WFD) classification shown in a River Basin Management Plan (RBMP) and a Q95 > 1.0 m^3/s. Watercourse in natural equilibrium exhibiting a range of morphological features (e.g. pools, riffles) that is free from any modification or human influence. Essential infrastructure or highly vulnerable development.
High	Locally significant attribute of high importance	Watercourse having a WFD classification shown in a RBMP and a Q95 <1.0 m^3/s. Very limited signs of modification or other human influences on morphology. More vulnerable development.
Medium	Of moderate quality and rarity	Watercourses not having a WFD classification shown in a RBMP and Q95 > 0.001 m^3/s. Watercourse showing signs of modifications and having a limited range of morphological features. Less vulnerable development.

Value of Receptor	Criteria	Typical Examples
Low	Lower quality, common place	Watercourses not having a WFD classification in a RBMP and a Q95 flow <0.001 m^3/s. A highly modified watercourse, changed by human pressures. No morphological diversity. Water compatible development.

Magnitude of water environment effects

4.4.7 The magnitude of impact criteria considers the expected scale, extent and duration of change, and the magnitude is assigned following consideration of the measures embedded into the design of the Proposed Project to reduce impacts. Temporary effects have been defined as those whereby the receptor can recover within a period of one year or less. The criteria are reproduced in Table 4.7.

Table 4.7 Classification of magnitude of impact

Magnitude of Impact*	Criteria	Typical Examples
Large adverse	Results in loss of attribute and/or quality and integrity of the attribute	Loss or extensive change to a fishery. Loss or extensive change to a designated nature conservation site. Reduction in waterbody WFD classification. Pollution of a public water supply or loss of a major industrial/agricultural supply. Extensive change to channel planform, replacement of large extent of natural bed/banks with artificial material. Increase in peak flood level (1% Annual Exceedance Probability (AEP)) of >100 mm.
Medium adverse	Results in effect on integrity of attribute, or loss of part of an attribute	Partial loss in productivity if a fishery. Pollution of a non-potential source of abstraction. Contribution to reduction in waterbody WFD classification. Degradation (quality or reliability) of a potable, commercial or agricultural water supply. Replacement of natural bed material or banks with artificial material over more than 3% of the water body's total length.

Magnitude of Impact*	Criteria	Typical Examples
		Increase in peak flood level (1% AEP) of >50 mm.
Small adverse	Results in some measurable change in attribute quality or vulnerability	Minor effects on water supplies. Slight change from baseline conditions of channel bed/banks. Increase in peak flood level >10 mm.
Negligible	Results in effect on attribute of insufficient magnitude to affect the use or integrity	Negligible change in peak flood level (<10 mm). No measurable impact on WFD waterbodies or river channel planform.
Small beneficial	Results in some positive effect on an attribute or reduced risk of negative effect occurring.	Creation of flood storage and reduction in peak flood level (1% AEP) >10 mm.
Medium beneficial	Results in moderate improvement of attribute quality	Contribution to improvement waterbody WFD classification. Improvements to morphological diversity at the local scale. Creation of flood storage and reduction in peak flood level (1% AEP) >50 mm.
Large beneficial	Results in major improvement of attribute quality	Removal of existing polluting discharge or removing likelihood of polluting discharges to a watercourse. Major improvement to morphological diversity at reach scale e.g. through culvert removal. Improvement in waterbody WFD classification. Creation of flood storage and reduction in peak flood level (1% AEP) >100 mm.
No change	No change, either beneficial or detrimental, to attribute quality	

**Terminology has been adapted from that used in LA113, DMRB (National Highways, 2020)

Significance of effects

4.4.8 The sensitivity of receptor and magnitude of impact are combined to give an overall preliminary significance of effect using the matrix set out in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**.

Assumptions and Limitations

4.4.9 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- No water quality sampling and analysis has been undertaken as it is considered that sufficient baseline data is available to generally characterise the water quality of surface water receptors.
- Data from the Environment Agency has been used to define the current condition and standards of protection provided by existing flood defences, no baseline condition surveys have been undertaken.
- Due to the potential interaction of one operational above ground element of the Suffolk Onshore Scheme (a permanent bridge over the River Fromus) with a fluvial floodplain, the Flood Risk Assessment (**Application Document 6.8 Flood Risk Assessment**) has been informed by flood risk modelling of the River Fromus. The model is based on the Environment Agency Fromus model, with suitable refinement and updating.

4.5 Basis of Assessment

4.5.1 This section sets out the assumptions that have been made in respect of design flexibility maintained within the Proposed Project and the consideration that has been given to alternative scenarios and the sensitivity of the assessment to changes in the construction commencement year.

4.5.2 Details of the available flexibility and assessment scenarios are presented in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project** and **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**.

Flexibility Assumptions

4.5.3 The environmental assessments have been undertaken based on the description of the Proposed Project provided in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**. To take account of the flexibility allowed in the Proposed Project, consideration has been given to the potential for effects to be of greater or different significance should any of the permanent or temporary infrastructure elements be moved within the Limits of Deviation (LoD) or Order Limits.

4.5.4 The assumptions made regarding the use of flexibility for the main assessment are set out in Table 4.8.

Table 4.8 Flexibility assumptions

Element of flexibility	How it has been considered within the assessment
Lateral LoD HVDC/HVAC cables	Lateral deviation of the cable route within the LoD would not be expected to result in a change in significance of reported effects. No new receptors would be impacted and although watercourses may be crossed at a

Element of flexibility	How it has been considered within the assessment
	different location, the same watercourses would be affected in the same reach lengths.
Lateral LoD Saxmundham Converter Station and Friston Substation	The assessment considers the potential for the converter station to be located anywhere within the defined lateral LoD. The LoD are tightly defined therefore it is considered that there is very limited potential for new or different effects on water environment receptors, due to the positioning of this asset anywhere within the defined lateral LoD.
Vertical LoD Saxmundham Converter Station and Friston Substation	This parameter does not affect the likely significance of effects on water environment receptors.
Lateral and Vertical LoD overhead line (where Friston Substation is built as part of the Proposed Project)	The assessment considers the potential for the proposed overhead line works to be located anywhere within the lateral LoD as shown in **Application Document 2.5.1 Work Plans – Suffolk**. The vertical LoD of OHL does not affect the likely significance of effects on water environment receptors.
Order Limits – temporary construction works	The assessment has considered the possibility of construction works impacting drainage ditches and watercourses anywhere within the Order Limits.

Consideration of Scenarios

4.5.5 The following scenarios with regards to Friston Substation have been considered in the assessment as described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**:

- Friston Substation is constructed under the development consent granted to Scottish Power Renewables (SPR), pursuant to 'The East Anglia ONE North (EA1N) Offshore Wind Farm Order 2022' and 'The East Anglia TWO (EA2) Offshore Wind Farm Order 2022'; or
- Friston Substation is built as part of the Proposed Project.

4.5.6 Under the first scenario there would be less construction footprint in this location and drainage provisions to serve the proposed Friston Substation would already be in place. In scenario two, any impacts of the construction works would be controlled and managed in accordance with the commitments set out in **Application Document 7.5.3.1 CEMP Appendix A Outline Code of Construction Practice** such that it has been concluded that there is no material difference between the two options with regard

to the potential for likely significant residual effects on water environment receptors. Therefore, the assessment within this ES applies to both scenarios.

4.5.7 The following options with regards to the proposed bridge over the River Fromus have been considered in the assessment as described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**:

- Option 1 - A bridge height of up to 6 m from the ground level at the abutment to the top of the parapet (which also equates to approximately 6 m form the Q95 flow level of the river to the bridge sofit) with 62 m long approach ramps; and
- Option 2 - A bridge height of up to 4 m from the ground level at the abutment to the top of the parapet (which also equates to approximately 4 m from the Q95 flow level of the river to the bridge sofit) with 42 m long approach ramps.

4.5.8 Both of the above bridge design alternatives have been assessed within the FRA (**Application Document 6.8**) and WFD Assessment (**Application Document 6.9 Water Framework Directive Assessment**) and the assessment presented herein considers both options, highlighting where any impacts are specific to or more significant for either one of the design options.

4.5.9 There is also optionality regarding the converter station construction compound location. Any one of the three areas of land included within the Order Limits (S02, SO3 and S04/05), as illustrated in **Application Document 2.14.1 Indicative General Arrangement Plans – Suffolk**, could be used for this purpose. With regard to effects on water environment receptors, all three plots are located in the same hydrological catchment and would drain to the same watercourse. The combined S04/S05 arrangement would require additional watercourse crossings than the other two options, to facilitate compound access, and so the assessment presented herein is based on this construction compound option as a worst case.

Sensitivity Test

4.5.10 It is likely that under the terms of the DCO, construction could commence in any year up to five years from the granting of the DCO which is assumed to be 2026. Consideration has been given to whether the effects reported would be any different if the works were to commence in any year up to year five. Where there is a difference, this is reported in Section 4.12.

4.6 Study Area

4.6.1 The study area has been defined to include all land within the Suffolk Onshore Scheme Order Limits, together with an additional 500 m buffer from this boundary. The study area is illustrated in **Application Document 6.4.2.4.1 Study Area and Water Environment Receptors**. This study area is justified based on technical knowledge of similar schemes and has been set following consideration of the distance over which likely significant effects on the water environment can reasonably be expected to occur. The study area has also been discussed and agreed with key water environment stakeholders.

4.6.2 The FRA that has been prepared (**Application document 6.8 Flood Risk Assessment**) covers a larger study area, having assessed potential for changes to baseline flood risk at the local catchment scale and within floodplain cells. The Water Framework Directive Assessment (**Application document 6.9 Water Framework**

Directive Assessment) includes a Zone of Influence (ZOI) that is set at the water body scale and includes all those WFD waterbodies with the potential to be affected. The ZOI is defined as land within the Suffolk Onshore Scheme Order Limits, in addition to land within 500 m of this boundary as well as coast waters at the landfall site up to one nautical mile.

4.7 Baseline Conditions

Watercourses, their Water Quality and Hydromorphology

4.7.1 Water features within the study area are illustrated **Application Document 6.4.2.4.1 Study Area and Water Environment Receptors**, with WFD waterbodies also illustrated in **Application Document 2.11.1 Water Bodies in the River Basin Management Plan – Suffolk**.

4.7.2 The Suffolk Onshore Scheme is situated in the hydrological catchments of the Hundred River and the neighbouring River Fromus, which is a tributary of the River Alde. These watercourses are designated main rivers and are waterbodies that are monitored under the WFD. The Hundred River and the Fromus rise to the north of Saxmundham. The River Fromus flows south, discharging to the River Alde near Snape. The Hundred River also follows a southerly flow path to drain to the coast south of Thorpeness.

4.7.3 The Hundred River is a WFD river waterbody within the Anglian RBMP and has a current (cycle 3 2022) ecological status of Bad, representing a deterioration from its 2019 status of Moderate. With regard to its chemical status, the most recent data available is from 2019, when the waterbody had a status of Fail. The Fromus, also a river waterbody, has a current ecological status of Poor, which is the same as its 2019 status and is also failing with regard to chemical status.

4.7.4 The Hundred River and the Fromus waterbodies are located in the East Suffolk management catchment. The Anglian RMBP (Environment Agency, 2022) indicates reasons for waterbodies in this catchment not achieving Good status are diffuse pollution from rural areas and transport drainage, barriers to natural fish movements, and river channel and habitat degradation. The RMBP sets out measures for the catchment to help these waterbodies reach a target status of Good by 2027. These focus on initiatives to help restore areas of eroded saltmarsh on the River Alde, and address barriers to fish movement and morphology improvements.

4.7.5 Table 4.9 presents a summary of the WFD baseline status of surface waterbodies within the study area.

Table 4.9 Summary of WFD surface waterbody status data (2022)

Waterbody	Overall Status	Ecological Status	Chemical Status
Hundred River	Bad	Overall – Bad Biological – Bad Physico-chemical – Moderate	Overall – Fail Priority Hazardous Substances – Fail Priority Substances - Good

Waterbody	Overall Status	Ecological Status	Chemical Status
		Hydromorphology – Supports Good Specific Pollutants - High	
River Fromus	Poor	Overall – Poor Biological – Poor Physico-chemical – Moderate Hydromorphology – Supports Good Specific Pollutants - High	Overall – Fail Priority Hazardous Substances – Fail Priority Substances - Good

4.7.6 Water quality monitoring data is available for the River Fromus from stations located to approximately 1.7 km southwest (Fromus at Watering Snape) and 0.75 km west (Fromus at Benhall Green Bridge) of the Order Limits. At Watering Snape, the most recently available data was recorded in 2018 and show that recorded concentrations of Orthophosphate exceed the published quality standards for this parameter. At Benhall Green, dissolved oxygen concentrations were less than the required percentage for achieving WFD high status. The Hundred River is monitored within the Order Limits at the tidal sluice at its downstream boundary. The data (2020 to 2021) shows a conductivity that exceeds to typical range for freshwater, indicating tidal influence, and exceedances for Orthophosphate and dissolved oxygen. Further details are provided in Appendix 3.5.A (**Application Document 6.3.2.5.A Appendix 2.5.A Water Environment Baseline Data**).

4.7.7 With regard to physical form, both waterbodies are classified as being 'Heavily Modified', meaning that as a result of physical alterations by human activity they have been substantially changed in character.

4.7.8 In addition to these main rivers, within the study area there are networks of ordinary watercourses, several of which are managed by the East Suffolk Water Management Board (WMB). The board manages water levels in these watercourses and maintains them. They have channels that are generally straight in their alignment and uniform in their geometry, reflecting their key function of facilitating land drainage and flood risk management.

4.7.9 In accordance with Table 4.9, the water quality attributes of both the Hundred River and the Fromus are assigned **High** sensitivity (value), meeting the criteria of having a WFD classification shown in a RBMP and a Q95 flow of less than 1.0m^3/s. Their hydromorphological sensitivity is assigned as **Medium**, given their current 'heavily modified' status, but accounting for the measures to improve this attribute set out in the RBMP.

4.7.10 The unnamed ordinary watercourses and land drains located in the study area are assigned **Medium** sensitivity for their water quality and **Low** sensitivity for their hydromorphological qualities. Baseline information regarding fisheries and other

ecological features of these waterbodies are described in **Application Document 6.2.2.2 Part 2 Suffolk Chapter 2 Ecology and Biodiversity**, which also presents the assessment of likely significant effects on these attributes.

Existing Water Interests (Surface Water Abstractions and Discharges)

4.7.11 Data to characterise existing surface water interests has been collected from the Environment Agency and with reference to a Groundsure report (April 2022). The data, which are illustrated in **Application Document 6.4.2.4.1 Study Area and Water Environment Receptors** and summarised in **Application Document 6.3.2.5.A Appendix 2.5.A Water Environment Baseline Data**, show that watercourses in the study area receive, transport and dilute consented discharges and support licensed abstractions.

4.7.12 The Hundred River and River Alde, of which the River Fromus is a tributary, support several abstractions for non-potable irrigation water supplies at the local scale. Within the study area the Hundred River also receives one consented sewage discharge (final and treated effluent) and one trade discharge (process effluent). Therefore, with regard to existing water interests, both receptors have been assigned **Medium** sensitivity. Information on groundwater abstractions is included in **Application Document 6.2.2.5 Part 2 Suffolk Chapter 5 Geology and Hydrogeology**.

Existing Flood Risk and Land Drainage

4.7.13 Based on the online Flood Maps (Environment Agency, 2023), the main sources of flood risk within the study area are the Hundred River and the River Fromus, with areas of Flood Zones 2 and 3 (medium to high risk) encroaching onto land within the Order Limits associated with these watercourses, as illustrated in **Application Document 6.4.2.4.2 Flood Risk Baseline**.

4.7.14 The areas of Flood Zone 2 (medium risk) and Flood Zone 3 (high risk) are largely similar in their extents: areas at risk are concentrated along the flow paths of the watercourses, with a larger area around the Hundred River wetlands near Thorpeness, and along the coastline at landfall. The remainder of the Order Limits of the Suffolk Onshore Scheme is shown to be in Flood Zone 1 (defined as at low risk of flooding from rivers and the sea).

4.7.15 The Hundred River floodplain benefits from a reduction in flood risk due to flood defences. This is reflected in the EA flooding from rivers and the sea data set, which shows that land within the Order Limits around the proposed landfall location and in the lower reaches of the Hundred River has an actual risk of flooding that is classified as low (between 0.1% and 1% chance each year). Further details of flood conditions are provided in the Flood Risk Assessment (**Application Document 6.8 Flood Risk Assessment**).

4.7.16 As the Proposed Project is classified as essential infrastructure, the floodplains of the watercourses in the study area are assigned **Very High** sensitivity/ value in line with the assessment criteria.

4.7.17 Flood risk from surface water runoff varies across the study area, with most areas at very low risk from this source. Areas mapped as at higher risk closely align with watercourse corridors. Within the study area ordinary watercourses and land drains perform a locally important function of managing surface water and providing drainage to allow the land to be farmed, therefore these features and the land drainage function they provide are assigned **Medium** sensitivity. There are also known surface water

flood risk sensitivities in the drainage catchments local to Friston, which has suffered flooding incidents in recent years, with the land drainage regime in this area assigned **High** sensitivity.

4.7.18 With regard to other potential flooding sources, the Environment Agency reservoir flood risk map (Environment Agency, 2024) shows that an area extending north and south of the River Alde, is at risk of flooding from this source. However, it is noted that this is a residual risk and that the likelihood of reservoir failure and consequent flooding is very low. The rural setting corresponds to a low risk of flooding from sewers. Further information on other sources of flood risk is provided in the FRA (**Application Document 6.8 Flood Risk Assessment**).

4.7.19 Further assessment of the Proposed Project's interactions with groundwater aquifers is provided in **Application Document 6.2.2.5 Part 2 Suffolk Chapter 5 Geology and Hydrogeology** and groundwater as a source of flood risk is addressed within the FRA (**Application Document 6.8 Flood Risk Assessment**), which includes further information on baseline flood risk from all relevant sources and includes a review of historical events within the study area.

Future Baseline

4.7.20 With regard to flood risk and drainage, future baseline conditions within the ES have been forecast, drawing on current best practice guidelines (Ministry of Housing, 2024) taking into account the likely impacts of climate change on rainfall intensities, river flows and tides/sea levels. These future conditions have been considered to factor in climate change resilience into the Proposed Project's design, for example, surface water drainage designs for operational infrastructure and bridge crossing designs.

4.7.21 The Suffolk Onshore Scheme is within the Environment Agency's East Suffolk management catchment (Defra, 2019), where peak rainfall intensity is anticipated to increase between 20% (central estimate) and 45% (upper end estimate) and peak river flow increases range from 19% to 54% in the design lifespan of the project.

4.7.22 The implementation of future cycles of WFD management plans driving future improvements in the ecological and chemical quality of water bodies has been considered when assigning value to water environment resources and receptors. However, future improvements in the hydromorphological quality of watercourses have not been presumed in assigning values as improvement in this attribute has typically longer timeframes.

4.7.23 The effects of future proposed developments within the Order Limits that are anticipated to be built prior to construction of the Proposed Project have also been considere . Where these developments have potential to cause effects on the baseline attributes of watercourses in the study area, this has been accounted for in the assigned receptor values.

4.8 Proposed Project Design and Embedded Mitigation

4.8.1 The Proposed Project has been designed, as far as possible, following the mitigation hierarchy in order to, in the first instance, avoid or reduce water environment impacts and effects through the process of design development, and by embedding measures into the design of the Proposed Project.

4.8.2 As set out in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**, mitigation measures typically fall into one of three categories: embedded measures; control and management measures; and mitigation measures. Embedded, and control and management measures are set out below. Additional mitigation measures are discussed in Section 4.10.

Embedded Measures

4.8.3 Embedded measures have been integral in reducing, and where possible avoiding, the water environment effects of the Proposed Project. Measures that that have been incorporated are:

- Sensitive routeing and siting of infrastructure and temporary works e.g. avoiding situating the proposed Saxmundham Converter Station and Friston Substation (the most vulnerable components of the Suffolk Onshore Scheme), and the proposed crossing of the River Fromus for access, in areas that are at risk of flooding (Flood Zones 2 and 3) and avoiding areas at high risk of surface water flooding.
- A commitment to make landfall using a trenchless crossing technique beneath the Hundred River marshes and three ordinary watercourses that drain this area.
- Saxmundham Converter Station and Friston Substation would be served with drainage systems that embed SuDS for attenuation of runoff to green field runoff rates in line with the requirements of the receiving watercourse authorities (Internal Drainage Board, Environment Agency or Lead Local Flood Authority and provide treatment of runoff (**Application Document 2.14.1 Indicative General Arrangement Plans - Suffolk**).
- Construction compounds, haul roads and bellmouths served by SuDS systems that would be constructed at the same time as the formation platform of these infrastructure (to reduce the risk of flooding during the construction stage) and which would include pollution controls to address the possibility of runoff contamination with oils and silts. Installation of filter drains/swales/header drains along the perimeter of construction compounds/parallel to haul roads to intercept 'clean' runoff from the adjacent land (**Application Document 2.14.1 Indicative General Arrangement Plans - Suffolk**).
- Commitments made within **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)** for example adoption of water conservation measures during construction.

Control and Management Measures

4.8.4 Measures relevant to the control and management of impacts during construction have been included within **Application Document 7.5.3.1 Appendix A Outline Code of Construction Practice**. The following measures have been taken into account in assessing the water environment effects of the Proposed Project: GG01, GG05, GG14, GG15, GG16, GG19, GG24, GG28, W01, W02, W03, W04, W05, W06, W07, W09, W10, W11, W12, W13, W14, W15, W16 and AS05.

4.8.5 GG03 commits the appointed contractor to include a suite of management plans within the CEMP and to monitor conformance with the plans, including for the management of water and soils. GG14 to GG19 describe controls on site runoff and construction activities such as refueling, materials storage, vehicle and wheel washing, to prevent pollution of the water environment. GG19 sets out the need to protect earthworks and

stockpiled soil by covering, seeding or using water suppression where appropriate. GG24 describes that a plan will be developed setting out procedures to respond to unplanned events (e.g. site flooding, pollution incidents) during construction of the Proposed Project. GG28 requires equipment to be readily available on site to clean spillages. The water environment related commitments (W) describe a range of controls that would be put in place to avoid or reduce impacts on watercourses during construction of the Proposed Project, with specific measures with regard to the management of flood risk (W06, W07, W12, W15), and land drainage (W10, W14, AS05).

4.8.6 Commitment W01 details that all qualifying works would be approved under environmental permits issued under the Environmental Permitting Regulations or other relevant secondary consents and permits, with W05 being specific to dewatering activities. W02, W03 and W04 all place controls on the design and methodologies for crossing watercourses in order to reduce impacts on water quality, hydromorphology riparian vegetation and aquatic ecology. W06 and W11 describe the controls that would be put in place to manage surface water drainage during construction and operation. W08 and W09 are linked to safeguarding existing private water supplies. Commitment W12 commits the contractor to monitoring existing flood defences during cable installation in agreement with Environment Agency protocols to ensure no detriment to the integrity of the defences. Commitments W14 and W15 commit to the preparation of two management plans, linked to drainage and flood risk, which shall consider all construction phase activities and temporary works necessary to deliver the Proposed Project and set out how the contractor would manage these aspects across the worksite, including details of how offsite impacts would be mitigated.

4.9 Assessment of Impacts and Likely Significant Effects

4.9.1 The assessment of the effects of the Proposed Project on water environment receptors described in this section considers the embedded and control and management measures described in Section 4.8.

Construction Phase

4.9.2 The construction of the Suffolk Onshore Scheme has the potential to impact a range of attributes of the watercourses that flow through the study area and change the existing land drainage regime and flood risk from a range of sources. These impacts would be temporary and are associated with:

- construction of watercourse crossings to provide temporary construction access to the working areas and to allow installation of the underground cables;
- soil stripping and earthworks;
- establishment and use of construction compounds;
- changes to land surface permeabilities due to earthworks, and the introduction of hard surfacing e.g. at construction compounds, the converter site and bell mouths; and
- interception of land drainage routes and disruption to existing field drainage systems within the construction swathe.

Water Quality

4.9.3 A total of 17 crossings of watercourses would be required along access routes, and HVDC/HVAC cable routes. These crossings comprise 11 temporary culverts and two permanent culverts situated on unnamed ordinary watercourses, one bridge over the River Fromus and three crossings of unnamed ordinary watercourses using trenchless techniques in the vicinity of landfall. A watercourse crossing schedule is provided at **Application Document 6.3.1.4.A Appendix 1.4.A Crossing Schedules**.

4.9.4 At watercourse crossing locations and temporary drainage outfalls there would be pollution risks linked to the generation of silted runoff and sedimentation, as well as pollution from construction plant (oils, hydrocarbons) and other materials. At the proposed culvert crossings of the ordinary watercourses (assigned medium sensitivity), as well as the proposed temporary drainage outfall into the Hundred River (assigned high sensitivity), localised temporary impacts are assessed as having a magnitude of small adverse, resulting in a **minor adverse** effect, which is considered to be **not significant**. This is because the suite of control and management measures that would be put in place would reduce sources of pollution and weaken pollution pathways.

4.9.5 At trenchless crossings of unnamed ordinary watercourses within the Hundred River catchment (assigned medium sensitivity), there is also the risk of pollution by silts, as well as the potential for breakout of drilling fluids (bentonite). Details of how the risks of this would be mitigated, and the protocols that would be enacted in the unlikely event of a breakout are provided in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**. With these measures in place, impacts are assessed as having a negligible magnitude, resulting in a **negligible** effect on the unnamed ordinary watercourses, which is considered to be **not significant**.

4.9.6 Crossing of the River Fromus (assigned high sensitivity for its water quality attributes) is proposed via an open span permanent bridge with an 8 m set back and providing for either a 2m or a 4m clearance between the top of bank and the bridge soffit (see **Application Document 2.13.1 Indicative River Fromus Crossing**). In either of the design options there would therefore be no in channel construction works and disturbance of the channel and its banks and the immediate riparian corridor of the river would be avoided. With the suite of control measures in place, impacts on the water quality of this receptor are therefore assessed as having a negligible magnitude, resulting in a **minor adverse** effect, which is considered to be **not significant**.

4.9.7 Soil stripping and the subsequent stockpiling and storage of soil in working areas could also cause deterioration of surface water quality by generating silted or polluted runoff. The construction swathe for the underground cables is drained by ordinary watercourses within the Hundred River catchment (medium sensitivity) and land drains (medium sensitivity). However robust control measures, described commitments AS01 and GG16 in the Register of Environmental Actions and Commitments (**Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC**), would reduce sources and remove or weaken impact pathways, such that the impacts on the water quality attributes of these watercourses are assessed as having a negligible magnitude, resulting in a **negligible** effect, which is considered to be **not significant**.

4.9.8 Construction compounds are proposed adjacent to the proposed Converter Station at one of three alternative locations (S02, S03 or combination of both S04 and S05 as shown within **Application Document 2.14.1 Indicative General Arrangement Plans – Suffolk**), with optionality retained in the application to accommodate the potentially forthcoming National Grid Ventures projects, and at the permanent access route across

the River Fromus (S01). The compound areas would drain to the River Fromus (high sensitivity) either directly or via tributaries (medium sensitivity).

4.9.9 At these compounds, higher risk activities, such as vehicle fuelling and storage of potentially polluting construction materials, would be managed in accordance with the good practice measures described in **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**, and robust site drainage measures would also be in place to reduce pollution risk. Consequently, the residual risk of pollution would reduce such that there would be no effect on the use or integrity of the watercourse receptors in proximity and receiving discharges from the compounds, satisfying the criteria defining a negligible magnitude of impact. A **minor adverse** to **negligible** effect is therefore assessed, which is considered to be **not significant**. In the scenario where the proposed Friston Substation is constructed as part of the Proposed Project, construction compounds are also proposed adjacent to the substation (S06 and S07), at two locations along the cable route (S08 and S09) and at the landfall site (S10), drainage from all of which is proposed to infiltrate to the ground. An assessment of the significance of effects on the groundwater receptor is covered in **Application Document 6.2.2.5 Part 2 Suffolk Chapter 5 Geology and Hydrogeology**.

4.9.10 Temporary deterioration of water quality could also have indirect effects in terms of detriment to existing abstraction and discharge licence holders due to receiving/supporting watercourses being degraded (Hundred River – medium sensitivity and River Alde – medium sensitivity). However, as discussed, when accounting for the embedded and control measures that would be implemented during the Proposed Project construction, the magnitude of impacts of the water quality of these watercourses is negligible, resulting in a **minor adverse** to **negligible** effects, which is considered to be **not significant**.

Surface Water and Land Drainage

4.9.11 In addition to the potential for water quality effects, soil stripping, earthworks and excavations, ground improvement works and the introduction of hard surfacing would all act to change the current rainfall runoff and land drainage regime. These works activities may also cause severance or disruption to existing field drainage systems (open ditches and buried pipe drainage systems) within the construction swathe. Increased rainfall runoff rates and volumes could arise, consequently increasing flows in receiving watercourses, and potentially encouraging waterlogging of soils and ponding of surface water.

4.9.12 The receptors with potential to be affected by these changes are the floodplains of receiving watercourses (very high sensitivity); land drains, existing land uses, people, property and infrastructure. Generally, these receptors have a medium sensitivity to surface water flooding, with the exception of land drainage regime in the area surrounding Friston (high sensitivity), due to a history of surface water and drainage related flooding issues.

4.9.13 Commitments to re-provide suitable means of existing field (land) drainage, (W11/AS05), to handle soils in accordance with a Soil Management Plan (AS01) and to provide robust controls on rainfall runoff rates from the working swathe and any impermeable areas created during construction of the Proposed Project (W06) would reduce the magnitude of effects, both during construction and after construction is completed, to small adverse to negligible, resulting in a **minor adverse** to **negligible** effects, which are **not significant**.

Hydromorphology

4.9.14 At crossings for access and where construction drainage outfalls are required, there is potential for detriment to the hydromorphological attributes of watercourses, including change to their channel profiles, flow regimes and floodplain connectivity.

4.9.15 The nature of many of the watercourses in the study area is such that they are of medium to low sensitivity for this attribute, as described in Section 4.7, due to their function as land drainage features and a history of modification and maintenance for this purpose, which has reduced their hydromorphological diversity. Temporary culverts are proposed for the majority of watercourse crossings for construction access. These culverts would be in place for the duration of the construction works and removed upon completion. The type of culvert and its design would be dependent upon the size and the ecological and hydrological properties of the watercourse, however, for the majority of watercourses box culverts are proposed (W03).

4.9.16 Culverts would be sized to maintain continuity of the existing land drainage regime and during installation pumps and pipes would operate to transfer the flow of water from the upstream side to the downstream side, bypassing the worksite (W04).

4.9.17 Culverted reaches would be highly localised and with suitable and site specific culvert design in accordance with the requirements of any secondary consents or permits necessary (from the IDB, LLFA or EA), the magnitude of impacts on the hydromorphology of the subject watercourses would be reduced to small adverse, resulting in a **minor adverse** effects, which are **not significant**.

4.9.18 At the crossing of the River Fromus (medium sensitivity) an open span bridge is proposed. In both of the bridge design options, the abutments would be set back 8m from each bank and the soffit height would avoid any impact on in channel flows, including during flood conditions. Modelling, further described within **Application Document 6.8 Flood Risk Assessment**, has demonstrated that there would be no discernable loss of floodplain connectivity or disruption to floodplain flow paths. The magnitude of this impact is assessed as **small adverse**, resulting in a **minor adverse** effect, which is not significant.

4.9.19 At the proposed temporary drainage outfall into the Hundred River (assessed medium sensitivity for its hydromorphological qualities), which would be in place for the duration of the construction works and removed upon completion, bankside works would temporarily alter the channel profile of the river. However, these works would have a very small footprint, therefore have been assessed as having a magnitude of impact of small adverse, resulting in a **minor adverse** effect, which is **not significant**.

Flood Risk

4.9.20 The Suffolk Onshore Scheme has largely avoided Flood Zones 2 and 3, however there would be localised interactions, primarily at landfall.

4.9.21 At landfall, the floodplain is defended, and the actual risk of flooding is defined as low. In addition, due to the proposed cabling installation method, there would be very limited physical disturbance of defended floodplain. Commitment W12 secures suitable monitoring of the flood defences to ensure no detriment to the integrity of the defences, and good practice measures (GG25) in the CoCP (**Application Document 7.5.3.1 CEMP Appendix A Outline Code of Construction Practice**) would protect the health and safety of construction personnel in the very unlikely event of flooding due to defence overtopping or breach. Therefore, it is considered that the Proposed Project would have a negligible magnitude of impact on the flood storage and floodplain flow

attributes of the Hundred River (very high sensitivity) and on other receptors including people, existing properties and infrastructure (high sensitivity). Overall effects would be **negligible** and **not significant**.

4.9.22 At the crossing of the River Fromus (very high sensitivity), the results of modelling of the proposed bridge and its abutments has demonstrated that there is no interaction with the functional floodplain, and that during the 1% annual chance flood event both of the bridge design options avoid any loss of floodplain storage and impediment to flows. Therefore, it is considered that the project would have a negligible magnitude of impact on the flood storage and floodplain flow attributes of the River Fromus (very high sensitivity) and on other receptors including people, existing properties and infrastructure (high sensitivity). Overall effects would be **negligible** and **not significant**.

4.9.23 When climate change over the lifetime of the Proposed Project is accounted for the proposed crossing, under both design scenarios, does not cause any impact on the existing flow regime of the River Fromus, nor any impact on its floodplain. Full details are provided in the Flood Risk Assessment (**Application document 6.8 Flood Risk Assessment**).

4.9.24 The FRA concludes that the Proposed Project is of low vulnerability to other forms of flooding and would not cause any change to the existing risk of flooding from these sources (reservoirs, sewers, groundwater). On this basis, the magnitude of effect is assigned as no change, with an overall effect that is **negligible** and **not significant**.

Operation and Maintenance Phase

4.9.25 Once the Proposed Project has been constructed, working areas would be fully reinstated. Surface water drainage from permanent access routes and the proposed Converter Station and Friston Substation sites would pose at low risk of contamination given the treatment measures proposed which are described in **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)** and temporary culverts would be removed and watercourse channels reinstated.

4.9.26 Construction phase pollution source-pathway links to water receptors and physical change at watercourse crossings would therefore be substantially reduced/reverted, with the exception of at the permanent crossing of the River Fromus via a new bridge and two culvert crossings of ordinary watercourses. Operational effects on the attributes of these watercourses are as assessed above for the construction.

4.9.27 As a consequence, and in line with the ES Scoping Opinion (**Application Document 6.15 Scoping Opinion 2022**), no likely significant effects on water environment receptors, land drainage or flood risk are anticipated during the operational phase of the Proposed Project.

4.9.28 On the basis of the types of maintenance activities that are envisaged, described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**, and given the control measures that maintenance activities would be subject to, which are described in **Application Document 7.5.3.2 CEMP Appendix B Register of Environmental Actions and Commitments (REAC)**, impact pathways would be sufficiently weakened such that it is considered unlikely that significant effects on the water environment would arise. This includes effects on watercourse flow regimes, flood risk, hydromorphology and water quality.

Decommissioning Phase

4.9.29 During decommissioning, key activities with the potential to impact on attributes of the water environment are the establishment and use of temporary compounds, the dismantling and demolition of the proposed Converter Station and Friston Substation and the potential for removal and recycling of the underground cables (which may be left in-situ).

4.9.30 The receptors with the potential to be affected are common to the construction phase of the Project and the magnitudes of impact on the water quality of watercourses and the land drainage regimes would be similar to described for construction.

4.9.31 All decommissioning activities would be expected to take place in accordance with the relevant environmental permitting regime, and in accordance with all good practice control and management measures. These measures would reduce sources of pollution generated by decommissioning e.g., silted runoff and would weaken source-pathway-receptor pathways. No likely significant effects associated with decommissioning of the Suffolk Onshore Scheme are therefore anticipated.

4.10 Additional Mitigation

4.10.1 After considering embedded and control measures no potential likely significant adverse effects have been identified. Additional mitigation measures are therefore not required to further reduce, mitigate or offset adverse environmental effects on water environment receptors.

4.11 Residual Effects and Conclusions

4.11.1 As described above, no additional mitigation measures are required to prevent or avoid likely significant effects on water environment receptors, therefore residual effects are as discussed in Section 4.9.

4.11.2 The assessment has concluded that there are no likely significant residual effects in relation to water environment receptors during construction, operation and maintenance and decommissioning of the Suffolk Onshore Scheme.

4.11.3 In accordance with paragraph 5.7.4 of EN-1, an FRA has been submitted as part of the application for development consent (**Application document 6.8 Flood Risk Assessment**). The FRA documents that with the embedded and good practice measures included, the Proposed Project would be resilient to climate change and that the project would be safe from flooding over its lifetime. In addition, the project would not cause any detrimental effects on flood risk to lands outside the Order Limits.

4.11.4 A WFD Assessment has been completed and submitted as part of the application for development consent (**Application document 6.9 Water Framework Directive Assessment**). The assessment concludes that the residual effects of Proposed Project activities on WFD waterbodies would be negligible, with no potential for waterbody deterioration at the waterbody scale following implementation of the embedded and good practice measures. The assessment concludes that the Proposed Project is compliant with the objectives of the WFD.

4.12 Sensitivity Testing

4.12.1 Under the terms of the DCO, construction could commence in any year up to five years from the granting of the DCO which is assumed to be 2026. It is considered that the effects reported would not differ should the works commence in any year up to year 5. This is because in assigning receptors sensitivities the potential for changes to future baseline conditions (discussion in Section 4.7) have been accounted for and there would be no change in the impact magnitudes that have been assessed, therefore no change to the overall significance of the effects reported.

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